Wanco® Arrow Boards

Smart Connected Truck-Mount Models

Owner's Manual

June 2025

WANCO® The industry leader.

Smart Connected Arrow Boards and Wanco Fleet Manager

Wanco Truck-Mount Arrow Boards are "connected" models that send data wirelessly to the Wanco Fleet Manager service. Fleet Manager provides remote access for managing Wanco traffic safety equipment. It is an optional service that may not be included with your arrow board.

To learn more about connected arrow boards, see page 37.

To learn more about Wanco Fleet Manager or to subscribe, contact Wanco Sales at 1-800-972-0755 or visit wanco.com.

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1 Introduction

1.1 Read before using

This is the owner's manual for Wanco® Connected Truck-Mount Arrow Boards, including factory mounting frames and standard controllers.

Arrow Boards with custom options may require additional information that is not provided in this document. Skid-mounted and 5-pattern arrow boards are covered in separate documents.

For your safety and protection from injury, carefully read, understand, and observe all instructions in this manual. Always read all instructions before performing a procedure.

Illustrations in this document represent all 7- and 12-pattern arrow board models, but might differ in detail from your arrow board.

Keep this manual with the arrow board. Additional and replacement manuals are available from the factory (see Section 1.6, "Where to obtain service," page 5).

If you have questions regarding this product, please contact Wanco Customer Service using the information in Section 1.6, page 5.

1.2 Arrow board models

All Wanco Connected Truck-Mount Arrow Board models are operationally similar. Functional differences between models are:

- Arrow board size
- Number of display lights
- Available display patterns
- Controller type
- Mounting frame style
- Power system

Available options are listed in Table 1-1, page 2.

All Wanco 7- and 12-pattern truck-mount arrow boards are "connected" arrow boards, or CABs. When operating, they send digital alerts to connected systems, notifying drivers of work zone hazards in advance and helping to improve roadway safety. For more about CABs, see Section 5.5, page 37.

Table 1-1. Options for truck-mounted arrow boards

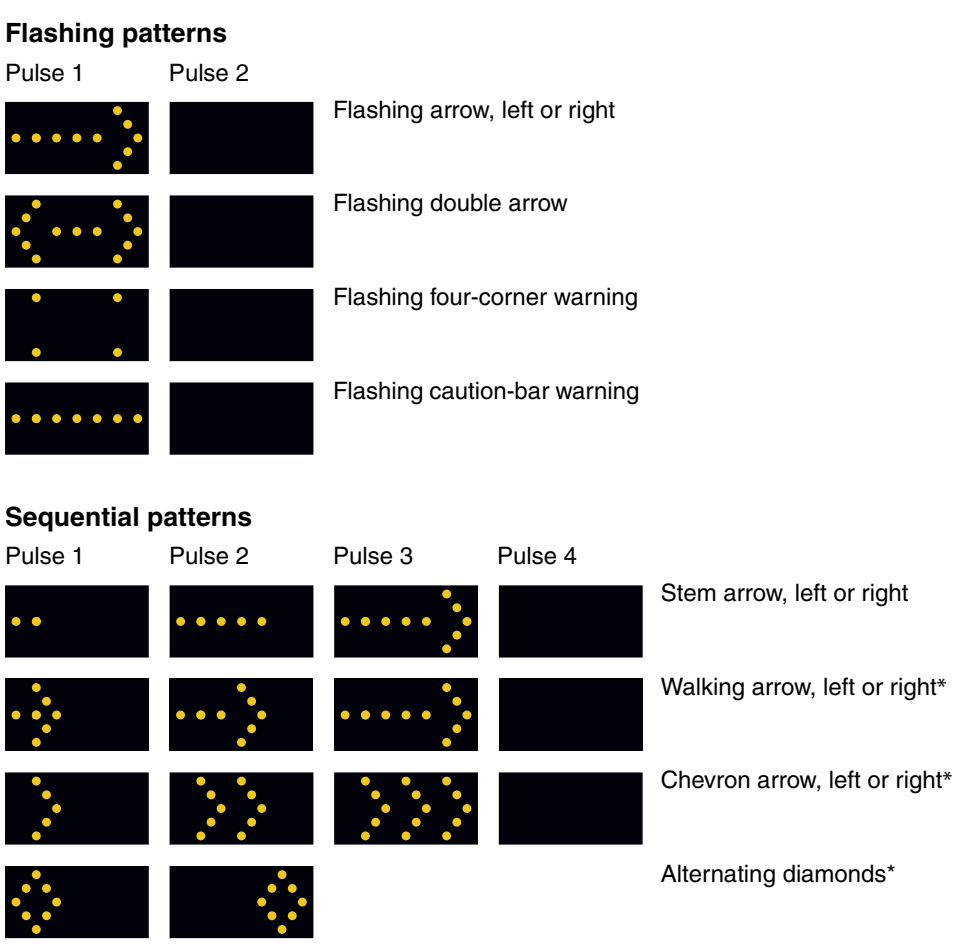
✓ *Check indicates available option*

	Arrow board size, H×W *(inches)*		
Lights and display patterns	**48×96**	**36×72**	**30×60**
25 lights, 12 patterns	✓	✓	✓
15 lights, 7 patterns	✓	✓	✓
Controller			
Wired controller	✓	✓	✓
Wireless controller	✓	✓	✓
Power system			
Vehicle power	✓	✓	✓
Integrated battery/solar power	✓	✓	✓
Mounting			
No mounting frame	✓	✓	✓
Manual (auto-lock) tilt frame	✓	✓	✓
90° power-tilt frame	✓	✓	✓
90° low profile power-tilt frame		✓	✓
180° power-tilt frame		✓	✓
Tailgate mounting kit	✓	✓	✓
Truck bed mounting kit	✓	✓	✓
Trailer mounting kit	✓		

1.3 Display patterns

Installed on a truck or trailer, arrows and caution patterns are selected using a controller that is typically installed inside the truck cab. Patterns are illustrated in Figure 1-1.

Figure 1-1. Display patterns



**Available only on 25-light models*

1.4 Applications

Truck-mounted arrow boards are widely used for temporary work zones and convoys. They feature bright LED lights that are highly visible and legible from a great distance.

Common applications include:

- Accident and incident management
- Emergency repairs
- Road-striping and street-sweeping convoys
- Crash-cushion (TMA) trucks and trailers

1.5 MUTCD requirements

The U.S. Department of Transportation's *Manual on Uniform Traffic Control Devices* (MUTCD), which defines the standards for traffic control devices on all public streets and private roads open to public traffic, specifies arrow board types and defines their minimum size, legibility distance, and number of lights.*

Table 1-2 lists the MUTCD Type for each Wanco Truck-Mount Arrow Board.

Consult the MUTCD for distance and legibility requirements for your application. The MUTCD is available online at http://mutcd.fhwa.dot.gov.

Table 1-2. MUTCD arrow board types

Arrow board size or style	MUTCD Type
24×48	A
30×60	B
36×72	B
48×96	C
Split plastic arrows	D

**MUTCD, 11th ed., December 2023, §6L.06, ¶05*

1.6 Where to obtain service

Before calling for service, please have the arrow board identification (ID) number ready. The ID number can be found in these locations (see Figure 1-2):

- On the bottom of the arrow board near the power cable
- On the back of the arrow board controller

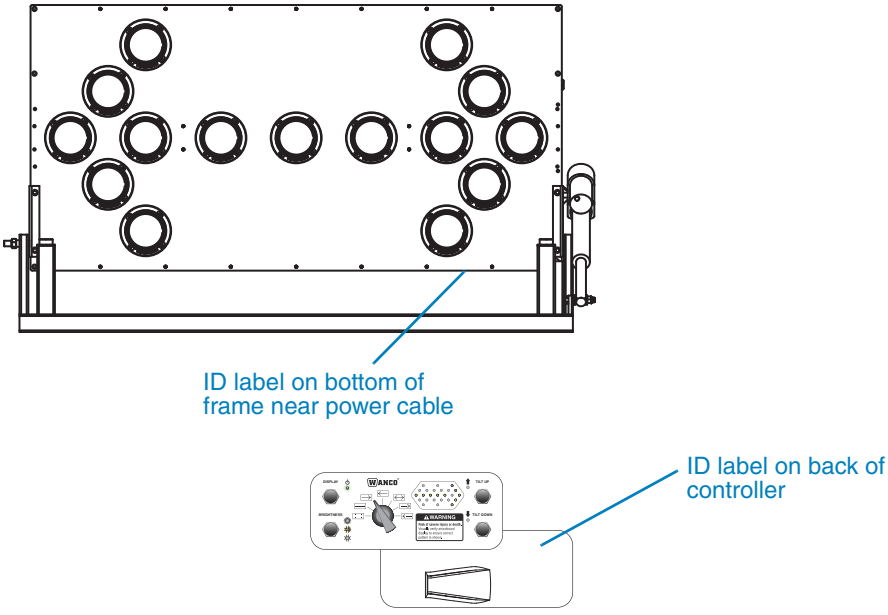
Contact our service department using the following information:

Wanco Inc.
5870 Tennyson Street
Arvada, Colorado 80003

303-427-5700
fax 303-427-5725

www.wanco.com
info@wanco.com

Figure 1-2. Identification number locations



2 Safety Information

2.1 Safety statements in this manual

This manual contains the following types of callouts, which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service. Each alert has a specific meaning, as described below:

⚠ The safety alert symbol alerts you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠ WARNING

Indicates an imminently hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION

Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in property damage.

IMPORTANT!

Indicates information that is of particular importance when transporting, operating, or servicing the equipment.

2.2 General safety

⚠ WARNING

Improper use of equipment could cause serious injury or death.

Prior to using this product, carefully read, understand, and observe all instructions in this manual.

⚠ CAUTION

Crush hazard.

When operating or working on the arrow board, keep hands and body parts clear of pinch points.

CAUTION

Welding on the vehicle can cause electrical damage to the arrow board and its controller.

Always disconnect arrow board and controller from power source before welding on vehicle.

2.3 Operating safety

Before using the arrow board, ensure the arrow board and its mounting system are in good operating condition. Never use any equipment that is damaged or in need of repair.

⚠ WARNING

Improper display could cause a traffic accident resulting in severe injury or death.

Visually inspect arrow board to ensure correct pattern is displayed.

- Always visually inspect the arrow board display to ensure it is operating as expected.
- Always fix or replace lights that are not functioning properly.

2.4 Service safety

⚠ WARNING

Moving parts can crush and cut.

Keep hands, feet, hair, and loose clothing away from moving parts.

⚠ CAUTION

Shock hazard.

Contact with live electrical circuits could damage equipment or cause injury.

- Disconnect arrow board from power before servicing any component on the arrow board.
- Only a qualified electrician should service the electrical system.

⚠ CAUTION

Adverse weather conditions can cause equipment damage and injury.

Whenever possible, perform maintenance indoors.

- To prevent injury, keep hands, feet, hair, and loose clothing away from all moving parts.
- Never perform any service unless all electrical components are shut down.
- If the arrow board, the vehicle, or the ground under or around the vehicle is damp or wet, allow it to dry before servicing.
- Do not service the arrow board if clothing or skin is wet.
- Always take precautions to ensure the safety of service personnel. Whenever possible, perform maintenance indoors, out of the weather, and away from traffic.
- For reliable arrow board performance, keep the arrow board and all its components clean.
- Always be aware of traffic when performing roadside maintenance.

3 Assembly

3.1 Read before assembling

- If the arrow board was ordered without a mounting kit, no assembly is required prior to installation. Proceed to Section 4, page 19, for installation instructions.
- If the arrow board has a mounting kit:
  - ☐ The mounting frame included with your arrow board might not fit your vehicle. Additional brackets or modifications may be necessary.
  - ☐ For assembly instructions for your arrow board mounting frame, see Table 3-1.
- For sizes, dimensions, and weights, see Appendix A, page 51.

Table 3-1. Assembly instructions

Mounting option	Arrow board base model no.	Assembly instructions
90-degree manual-tilt (auto-lock) frame	WFB	Section 3.2, page 12
90-degree power-tilt frame	WFBP	Section 3.3, page 14
Low-profile 90-degree power-tilt frame	WLP90B	Section 3.4, page 15
180-degree power-tilt frame	WFP180B	Section 3.5, page 15
Tailgate kit	WVGB	Section 3.6, page 16
Truck-bed kit	—	Section 3.7, page 17
Trailer-mount kit	—	Section 3.8, page 18

3.2 Auto-lock frame

The auto-lock frame is a manually-operated tilt frame that allows the arrow board to tilt from horizontal to vertical. It has a spring-loaded pin that automatically engages to lock the frame in position at 90-degree intervals. The auto-lock frame does not have an electrically powered tilt mechanism.

To assemble the auto-lock frame, refer to Figure 3-1 and follow these steps:

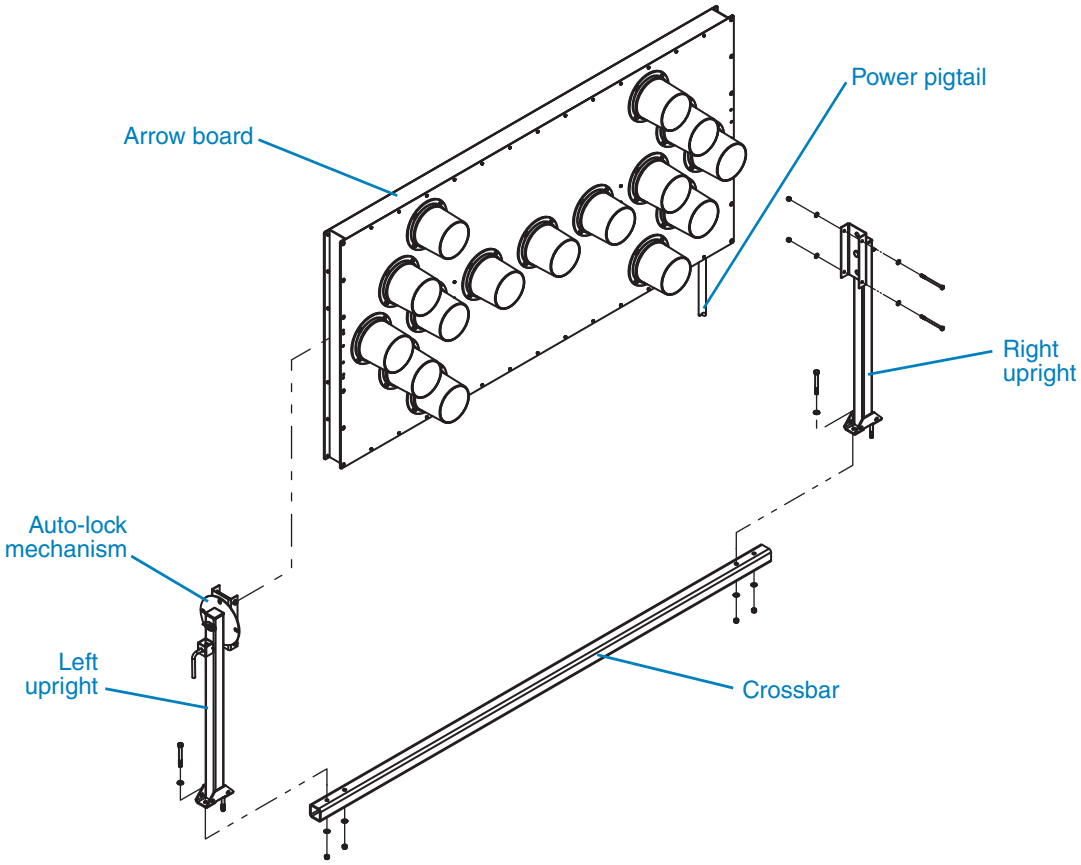
1. Ensure the arrow board is oriented with the power cable pigtail coming out the bottom.
2. Identify the left upright, which includes the auto-lock mechanism.
3. Attach the left upright to the arrow board using two bolts, four washers, and two nuts.
4. Attach the right upright to the arrow board using two bolts, four washers, and two nuts.
5. Attach both uprights to the crossbar using four bolts, eight washers, and four nuts.

   Note that the location of these bolts can also be used for attaching the entire assembly to the vehicle, or to the optional Wanco truck-bed mounting brackets. Longer, user-supplied bolts would go down through the uprights, cross bar, and supporting structure on the vehicle or truck-bed brackets, attaching them together.

   If your installation will use this approach, either attach the uprights to the crossbar first, leaving them hand-tight, and complete the installation later when installing the assembly on the vehicle; or proceed to Section 3.7, page 17, to complete the assembly with the truck-bed brackets.

   Regardless of the installation, the uprights must be attached to the crossbar.
6. Ensure all connections are tight.
7. Test the tilt and auto-lock mechanism (see Section 5.4.2, page 36).

Figure 3-1. Assembling the auto-lock frame with an arrow board



3.3 90-degree power-tilt frame

The 90-degree power-tilt frame has an electric actuator that allows the operator to tilt the arrow board from horizontal to vertical and back again. The operator controls the actuator using the arrow board controller, which is usually located inside the vehicle.

If the arrow board and power-tilt frame were received from the factory already assembled, no further assembly is required prior to installation. Proceed to Section 4, page 19, for installation instructions.

To assemble the power-tilt frame, refer to Figure 3-2 and follow these steps:

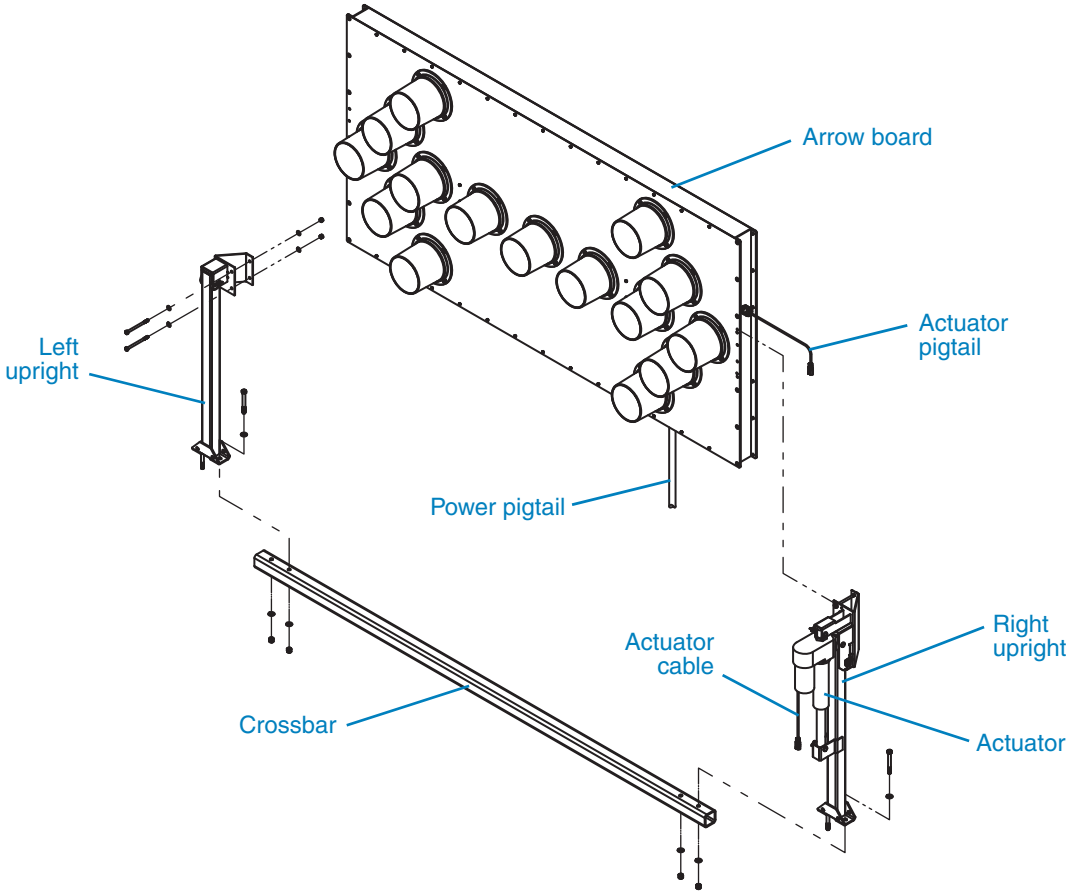
1. Ensure the arrow board is oriented with the power cable pigtail coming out the bottom.
2. Identify the right upright, which includes the actuator.
3. Attach the right upright to the arrow board using two bolts, four washers, and two nuts.
4. Locate the actuator pigtail on the side of the arrow board, and connect it to the actuator cable.
5. Attach the left upright to the arrow board using two bolts, four washers, and two nuts.
6. Attach both uprights to the crossbar using four bolts, eight washers, and four nuts.

   Note that the location of these bolts can also be used for attaching the entire assembly to the vehicle, or to the optional Wanco truck-bed mounting brackets. Longer, user-supplied bolts would go down through the uprights, cross bar, and supporting structure on the vehicle, or the truck-bed brackets, attaching them together.

   If your installation will use this approach, either attach the uprights to the crossbar first, leaving them hand-tight, and complete the installation later when installing the assembly on the vehicle; or proceed to Section 3.7, page 17, to complete the assembly with the truck-bed brackets.

   Regardless of the installation, the uprights must be attached to the crossbar.
7. Ensure all connections are tight.
8. After installing the arrow board on the truck (see Section 4, page 19), use the controller to test the electric actuator and tilt frame for proper operation. For a wired controller, see Section 5.2, page 31. For a wireless controller, see Section 5.3, page 34.

Figure 3-2. Assembling the 90-degree power-tilt frame



3.4 Low-profile 90-degree power-tilt frame

The low-profile 90-degree tilt frame is installed onto the arrow board at the factory and does not require assembly.

After installing the arrow board on the truck (see Section 4, page 19), use the controller to test the electric actuator and tilt frame for proper operation. For a wired controller, see Section 5.2, page 31. For a wireless controller, see Section 5.3, page 34.

3.5 180-degree power-tilt frame

The 180-degree tilt frame is installed onto the arrow board at the factory and does not require assembly.

After installing the arrow board on the truck (see Section 4, page 19), use the controller to test the electric actuator and tilt frame for proper operation. For a wired controller, see Section 5.2, page 31. For a wireless controller, see Section 5.3, page 34.

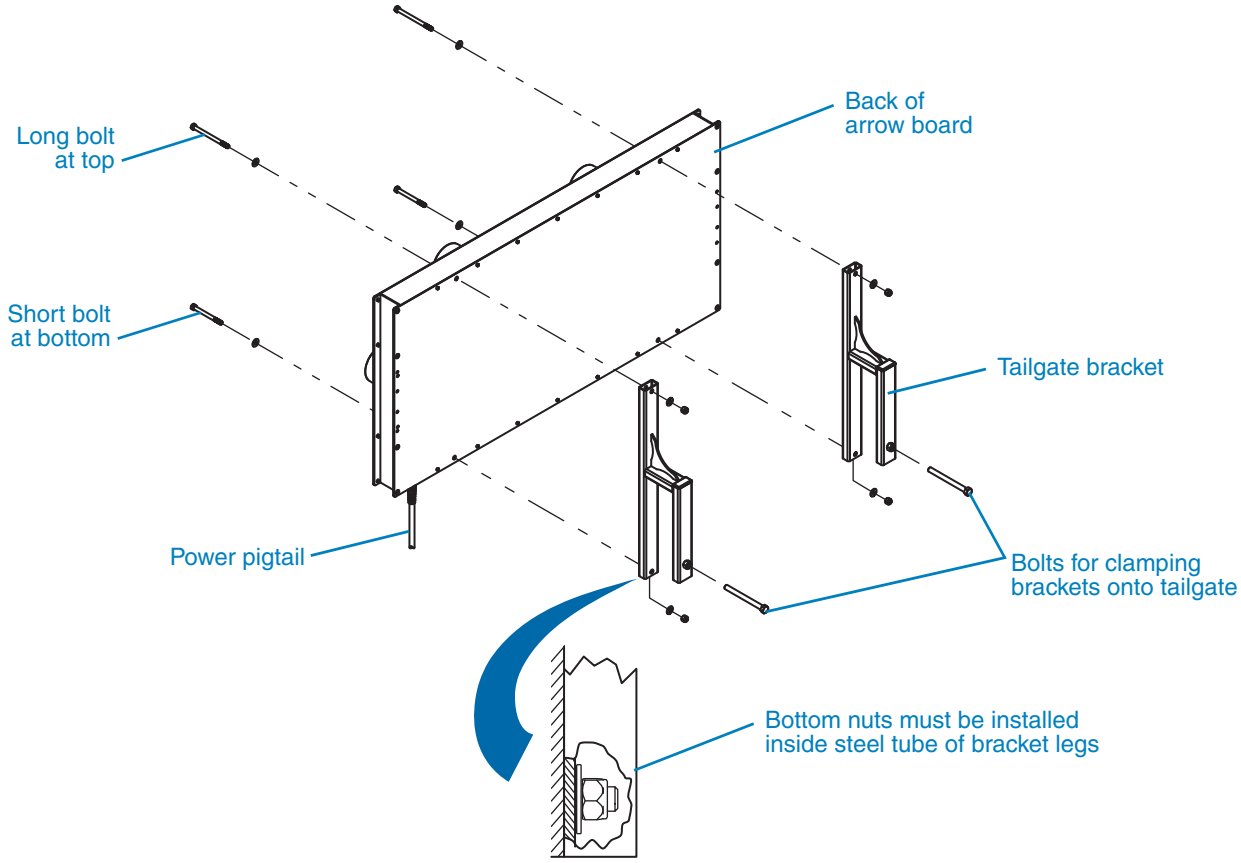
3.6 Tailgate kit

The tailgate kit allows the arrow board to be installed in a fixed position on a truck tailgate. Two brackets are attached to the arrow board and then clamp to the tailgate for permanent or temporary installation.

To assemble the tailgate kit, refer to Figure 3-3 and follow these steps:

1. Ensure the arrow board is oriented with the power cable coming out the bottom.
2. Two mounting holes near the top of the arrow board and two near the bottom are used for attaching the tailgate brackets to the arrow board. Locate these four holes.
3. Attach either bracket to the arrow board using two bolts, four washers, and two nuts. Use the longer bolt at the top of the arrow board, the shorter bolt at the bottom. The washer and nut at the bottom of the bracket must go inside the bracket leg.
4. Repeat Step 3 for the remaining bracket.
5. Ensure all connections are tight.
6. When installing the arrow board with tailgate brackets onto the truck (Section 4, page 19), ensure the brackets are well seated, all the way down on the tailgate, and the bolts for clamping the brackets to the tailgate are tightened and secure.

Figure 3-3. Assembling the tailgate kit



3.7 Truck-bed kit

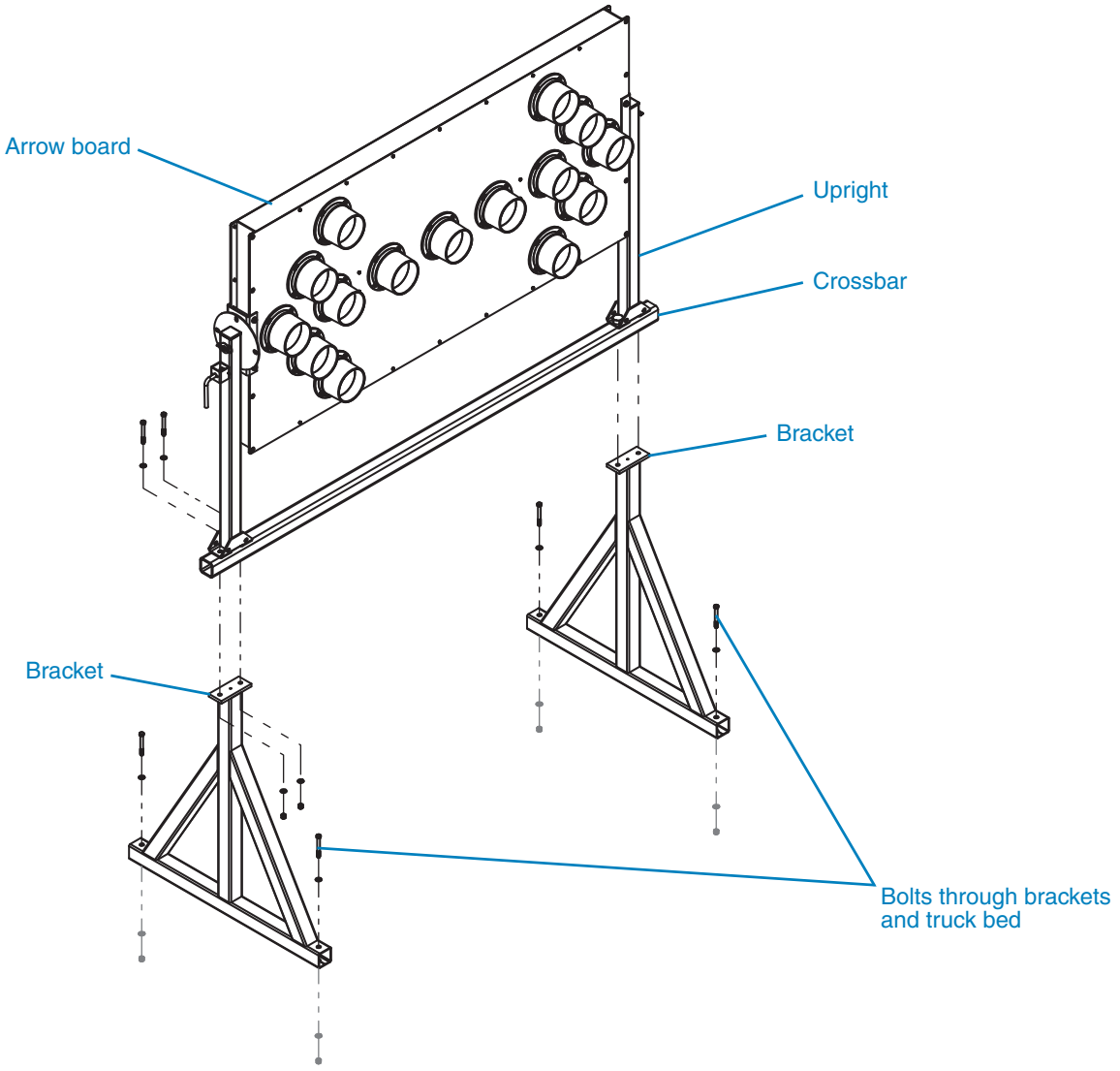
The truck-bed kit allows the arrow board to be installed on a truck bed. Two brackets are bolted to the bed and support either the 90-degree manual-tilt or 90-degree power-tilt frame. Hardware for attaching the brackets to the truck are user-supplied.

To assemble the truck-bed brackets onto the tilt-frame crossbar, use four bolts, eight washers, and four nuts (see Figure 3-4). All bolts should go down through the tilt frame uprights, crossbar, and truck-bed brackets. Ensure all connections are tight.

When installing the arrow board onto the truck with truck-bed brackets (Section 4, page 19), ensure the brackets are flat and secure on the truck bed. Ensure all connections are tight.

After installation on the truck, test the auto-lock mechanism (see Section 5.4.2, page 36) or use the controller to test the electric actuator and tilt frame (Section 5.4.1, page 36) for proper operation.

Figure 3-4. Assembling the truck-bed kit



3.8 Trailer-mount kit

The trailer-mount kit allows the arrow board to be installed on a trailer, but is specifically designed for easy installation on a Traffix Devices Scorpion® attenuator trailer.

On the Scorpion trailer, two uprights slide into brackets on the front end of the trailer frame and are bolted in place. On other trailers, custom brackets must be user-supplied.

The trailer-mount arrow board and tilt frame are assembled at the factory. For trailer mounting, refer to Figure 3-5 and choose whether to:

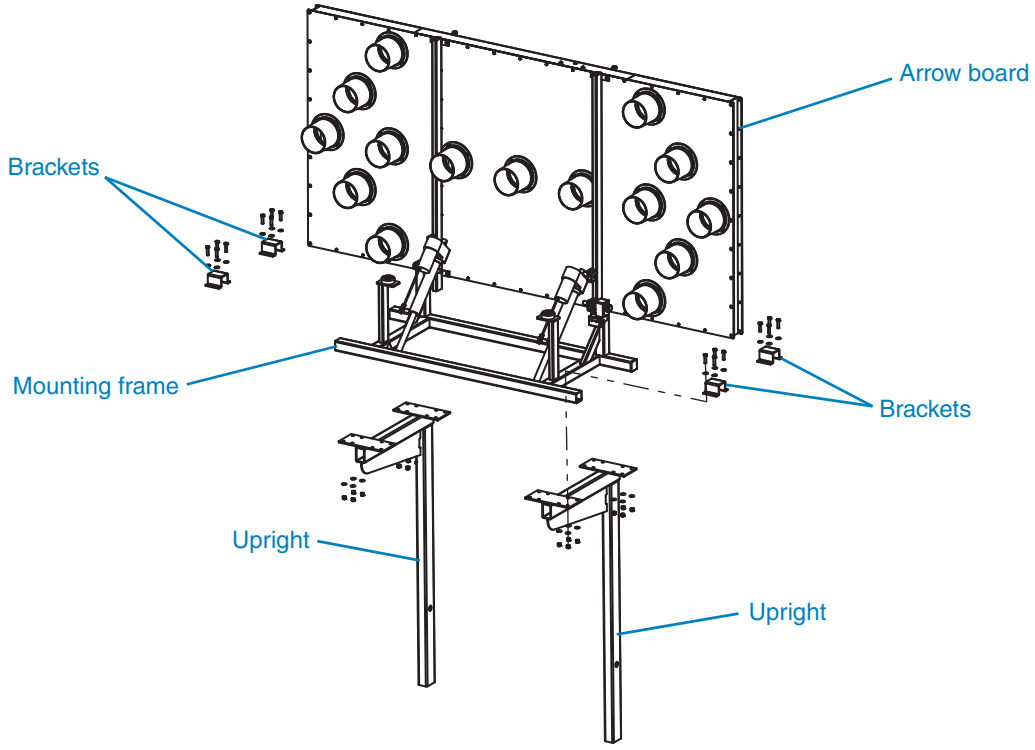
- Attach the two uprights to the arrow board mounting frame and then install the entire assembly on the trailer.
- Attach the uprights to the trailer and then attach the arrow board mounting frame to the uprights.

  Before installing the uprights, orient the arrow board so that it will face traffic (lights toward the rear of the trailer) when it is tilted up to the vertical position.

  Use all four brackets and either set of holes on the uprights to clamp the mounting frame down onto the uprights. Use four bolts, eight washers, and four nuts for each bracket. Ensure all connections are tight.

  After installation (Section 4, page 19), test the electric actuators and tilt frame for proper operation. For a wired controller, see Section 5.2, page 31. For a wireless controller, see Section 5.3, page 34.

Figure 3-5. Assembling the trailer-mount kit



4 Installation

Step 1: Installing the arrow board

The Wanco Connected Truck-Mount Arrow Board is designed for installation on a truck or other large vehicle. It may be mounted on the truck bed or over the cab. The arrow board may also be installed on a trailer, such as a crash-cushion (TMA) trailer.

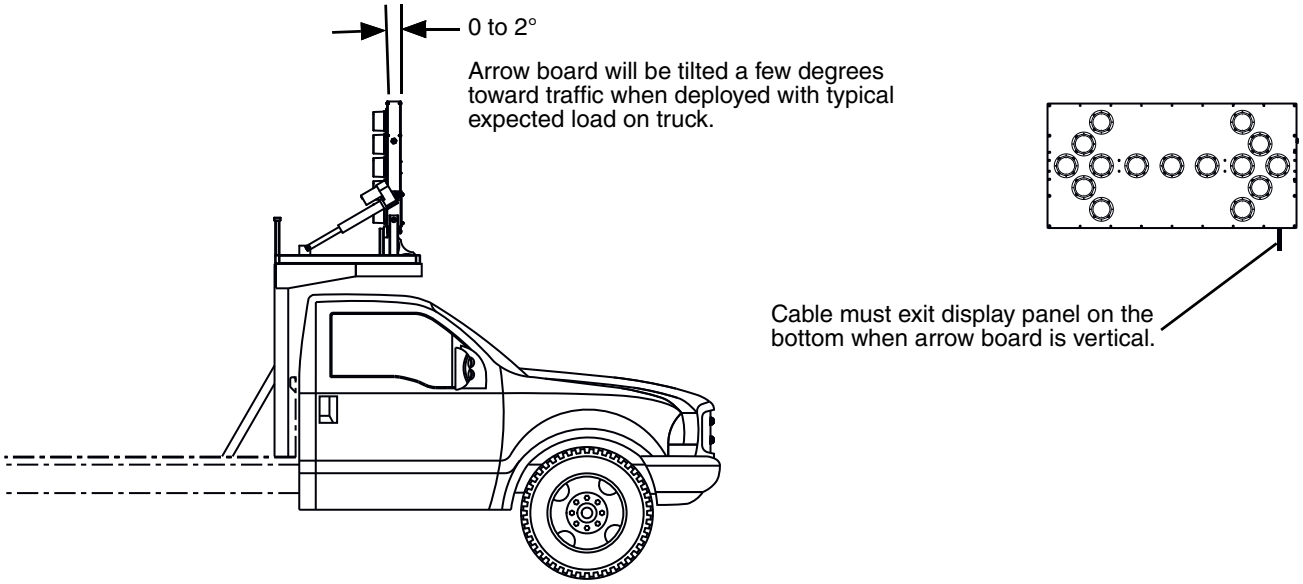
IMPORTANT!

Because there are many manufacturers and different types of vehicles, Wanco strongly recommends using a reputable truck upfitter to install the arrow board. Wanco provides only the arrow board assembly and wiring harness. The support structure and power connections are left up to the customer.

Use an experienced installer. Follow all guidelines and instructions provided by the vehicle manufacturer Body Builder Books.

- The arrow board might include an integrated or separate mounting frame. Several types of mounting frames are available from the factory. The mounting frame included with your arrow board might require modifications or additional brackets to fit your vehicle. Because installations vary, the factory does not include nuts and bolts for attaching the arrow board to the truck or trailer. Dimensions for standard Wanco mounting options are provided in Appendix A, page 51.
- Trailer-mounted arrow boards require a power source, such as batteries, an engine, or a generator. Your arrow board might include an optional, integral power system that includes batteries, a battery box, and a solar panel.
- Install the arrow board, mounting frame, and (if included) optional battery box using at least four sets of bolts, nuts, and washers. Orient the arrow board as illustrated in Figure 4-1, page 20.
- Use shims to ensure that, in the upright position with no load in the truck, the arrow board is vertical. With a typical load on the truck, the arrow board will angle downward about two degrees toward traffic (see Figure 4-1).
- If your arrow board includes a power-tilt frame, it might be necessary to tilt the arrow board up slightly from the horizontal position to complete the installation. In this case, begin by partially installing the arrow board and mounting frame, then make all wiring and power connections, and finish by completing the arrow board installation.

Figure 4-1. Arrow board installation



Step 2: Installing the controller

The arrow board controller is not weather resistant, and must be installed inside the truck cab or inside a weatherproof enclosure.

When choosing where to install the controller, select a location that will allow easy access and will not interfere with truck controls. Common mounting locations are the windshield and on or under the dashboard.

⚠ WARNING

Poor controller location might result in a traffic accident that could cause serious injury or death.

Locate the controller where it can be operated safely under all driving conditions.

⚠ WARNING

Interfering with air bags could result in serious injury or death.

Do not install the controller where it may interfere with deployment of the vehicle's air bags or any other safety equipment. Refer to the vehicle owner's manual to determine the vehicle's air bag deployment zones.

⚠ CAUTION

Drilling holes through vehicle panels could result in equipment damage or personal injury.

When drilling holes for controller mounting bracket, use care to avoid damaging vehicle wiring and other sensitive equipment.

- To avoid potential interference from other devices, depending on the radio frequencies being used, install the controller as far as possible from other RF-emitting devices.
- Before choosing a location for a wired controller, take into account that a Cat 5 (Ethernet) cable must be routed between the arrow board and controller.
- If your arrow board is wireless, there is no wiring between the arrow board and controller. However, the arrow board must be wired to a power source, and the wireless controller must also be connected to a power source. The arrow board has its own power cable, and the wireless controller includes one of two possible cables:
  - A power cord that plugs into the truck's power outlet/cigar lighter
  - A cable that can be wired directly into the truck's 12-volt system
- All Wanco arrow board controllers include a mounting bracket. Because installations vary, the factory does not include hardware for attaching the bracket to the vehicle.
- The mounting brackets for wired controllers can be removed and reoriented for mounting the controller either on or under the dashboard.
- The wireless controller includes a fully adjustable suction-cup mount that can attach without hardware to the inside of the truck's windshield or to a smooth surface. On the back of the wireless controller is a bracket that can accept any universal (camera-type) mount with a 1/4-20 thread.

Step 3: Installing the optional battery box and solar panel

If the arrow board system includes an optional battery box and solar panel, you may need to install them on the vehicle.

- Choose a location such that cables can reach the battery box, solar panel, and arrow board.
- Use P-clamps where necessary to keep cables from hanging loose, wearing, and being pinched. Never use wire ties to secure or hold cables in place. Do not let the cables hang loose.
- If the solar panel is attached to an arrow board on a tilting frame, leave slack in the panel's cable.

The battery box and the solar panel may already be installed on the arrow board, depending on the design and configuration.

Step 4: Installing wiring

Wiring connections must be made between the arrow board, the controller, and a 12-volt DC power supply (typically the vehicle power system).

All cables and components are included with the arrow board but may be packaged separately when shipped from the factory.

To route cables and make wiring connections, follow the instructions below.

IMPORTANT!

Your Wanco arrow board requires power from a 12-volt DC negative-ground system. If your vehicle has an electrical system other than 12VDC, contact the factory before proceeding.

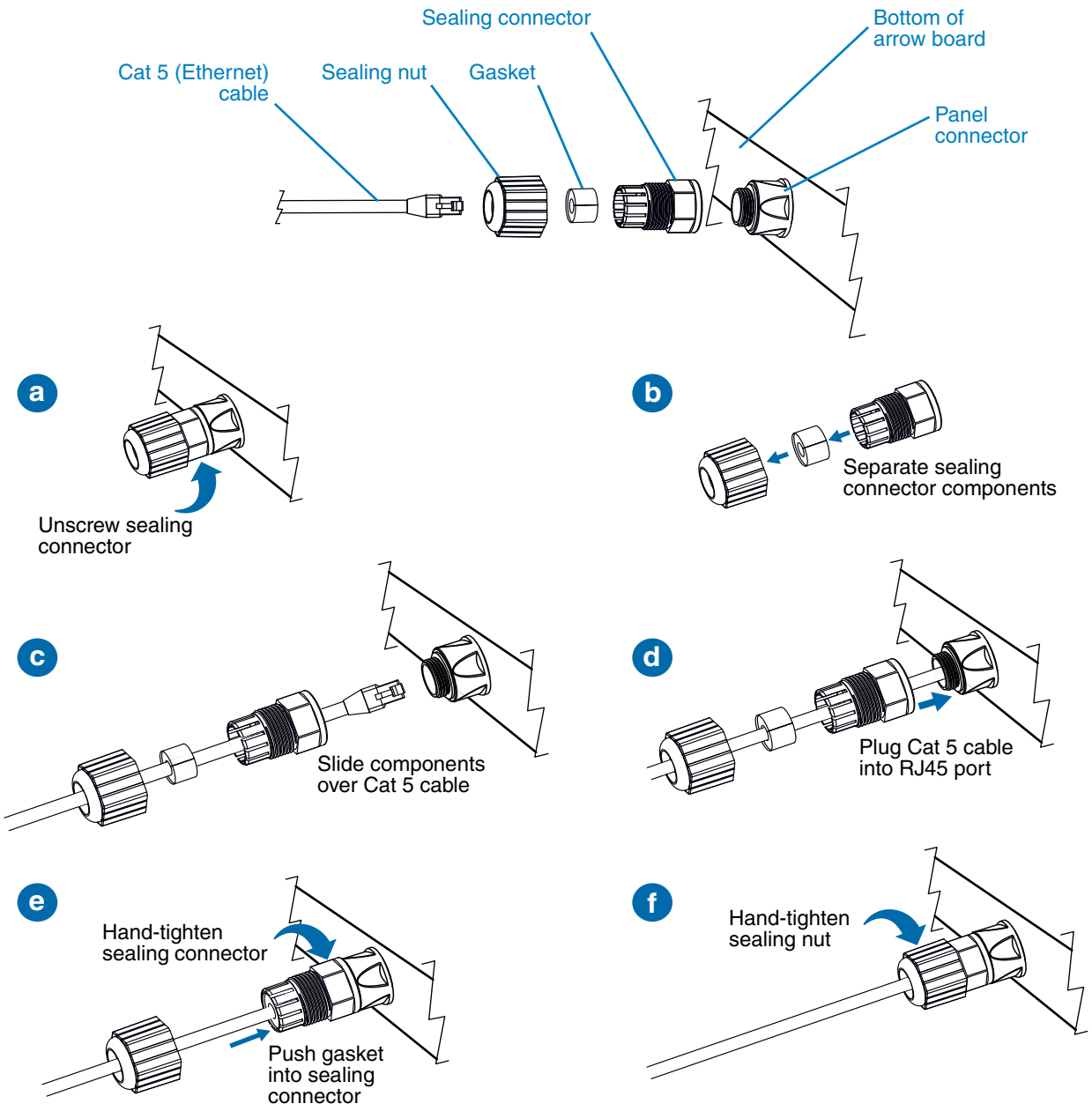
Wanco does not provide wiring schematics for vehicle-mounted arrow boards. Because installations vary, you must follow the vehicle manufacturer's requirements for installing auxiliary equipment. Consult your vehicle owner's Body Builder Books or contact the manufacturer for wiring instructions.

Use an experienced installer. Follow all guidelines and instructions provided by the vehicle manufacturer's Body Builder Books.

1. Determine how the arrow board will be powered:
   - The arrow board may be wired to operate while the vehicle is running or when it is not. The preferred method is to have the vehicle running while the arrow board is operating.
   - Some installations include an optional automated solar-based charging system that is independent of the vehicle's power. Others may include an auxiliary battery or a portable generator.
   - The system's maximum power load is 2 amps (or 30 amps with an electric actuator) at 13.6 volts DC.
   - Most vehicle manufacturers provide instructions for installing auxiliary equipment. Consult your vehicle's Body Builder Book for wiring instructions.
   - In all cases, the battery must have an active charging system; otherwise, the arrow board will eventually drain the battery voltage and automatically shut down.
2. For a wired controller, plug the included Cat 5 (Ethernet) cable into the port on the bottom of the arrow board. Refer to Figure 4-2 and follow these steps:
   a. Locate the sealing connector and unscrew it from the panel connector.
   b. Unscrew the sealing nut from the sealing connector and remove the gasket.
   c. Thread the Cat 5 cable through the sealing nut, gasket, and sealing connector.
   d. Plug the Cat 5 cable into the RJ45 port inside the panel connector. When properly inserted, the cable plug will snap into place with an audible "click,"

      If the Cat 5 cable needs to be removed from the port, use a small flat-blade screwdriver to push down the tab on the cable's plug (see Section 7.5, page 46).
   e. With the ridged side of the gasket facing out, push the gasket into the sealing connector. Then screw the sealing connector over the end of the panel connector and hand-tighten.
   f. Screw the sealing nut onto the sealing connector and hand-tighten.

Figure 4-2. Controller cable connection to arrow board



3. Make cable connections at the arrow board:
   a. Attach the power cable to the power pigtail on the bottom of the arrow board.
   b. If the arrow board has a power-tilt frame, locate the matching pigtails from the side of the arrow board and the electric actuator. If the pigtails are not already plugged into each other, then plug the arrow board pigtail into the actuator pigtail.
4. Before routing cables, observe safety requirements to ensure proper operation of all equipment, the arrow board, and the vehicle.

⚠ WARNING

Interfering with the vehicle's safety restraints could result in serious injury or death.

When routing electrical wiring through the vehicle, ensure that cables and wires do not interfere with passenger safety restraints such as seat belts and air bags. Refer to the vehicle's Body Builder Book to determine the vehicle's air bag deployment zones.

⚠ CAUTION

Improper wiring can result in equipment failure and serious injury.

- When drilling holes, use care to avoid damaging vehicle wiring and other sensitive equipment.
- Where wires and cables penetrate vehicle panels, use appropriate grommets to protect wiring from sharp edges.
- Ensure wires and cables do not interfere with vehicle operation.
- Keep wires and cables clear of gas, clutch, and brake pedals.
- Keep wires and cables clear of pinch points and heat sources such as exhaust pipes.
- Do not force wiring connectors together. Ensure connectors are properly aligned, then gently press together. Do not remove, bend, or damage wire connector pins.
- Add cable and wire service loops wherever needed to support proper movement and operation of the arrow board.

5. Route cables from the arrow board, but DO NOT connect any cables yet:
   - Do not cut any cables or rewire connectors to make the cables shorter. Instead, determine where the extra lengths of cable can be stowed safely after connections are made. After routing cables, coil—do not bundle—the extra lengths using nylon wire ties.
   - Do not bundle cables. Bundling can damage cables and cause equipment failure.
   - Installed cables should be protected by a weather-resistant loom. Use P-clamps where necessary to keep cables from hanging loose, wearing, and being pinched. Never use wire ties to secure or hold cables in place.

- For a wired controller, refer to Figure 4-3 and follow these instructions:

  a. Route the Cat 5 cable from the arrow board into the truck cab and to the controller, then plug the cable connector into the back of the controller.

  b. Because the arrow board does not have an on/off switch, ensure the power cable from the arrow board will include a circuit-disconnect for disengaging power easily; for example, a relay connected to the vehicle ignition switch. If wiring a fuse into the circuit, the fuse should be at the battery. For an arrow board with a power-tilt frame, use a 30-amp fuse; otherwise, use a 5-amp fuse.

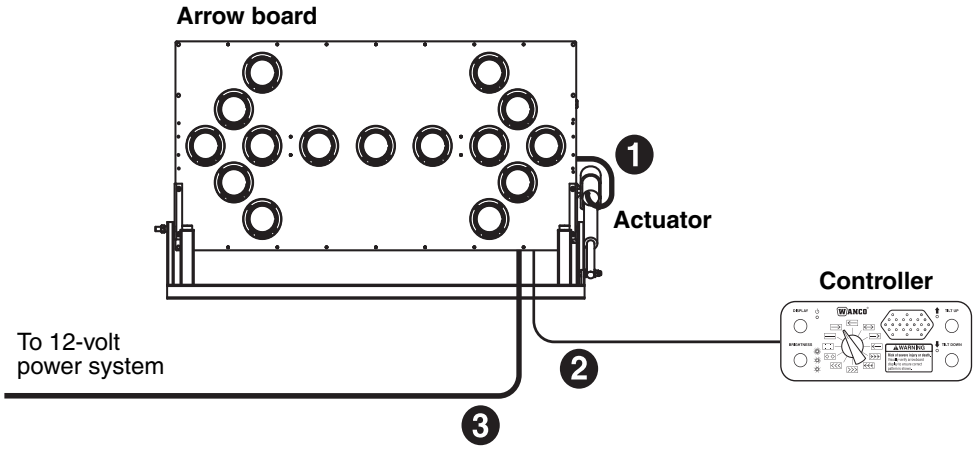
  c. Route the power cable from the arrow board to the power supply. DO NOT connect the cable to power yet.

  d. Check all wiring connections and fasteners, ensuring no wiring will come loose during operation.

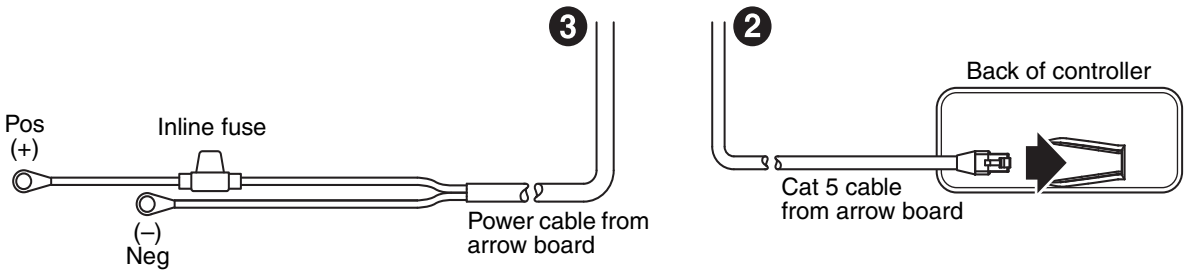
  e. Connect the power cable from the arrow board to the power supply according to the vehicle manufacturer's instructions.

Figure 4-3. System wiring for wired controllers

Overview



Detail



- For a wireless controller, refer to Figure 4-4 and follow these instructions:

    a. If the arrow board has a power-tilt frame, locate the matching pigtails coming out the side of the arrow board and out from the actuator. If these pigtails are not already plugged into each other, then plug the arrow board pigtail into the actuator pigtail.

    b. Because the arrow board does not have an on/off switch, ensure the power cable from the arrow board will include a circuit-disconnect for disengaging power easily; for example, a relay connected to the vehicle ignition switch. If wiring a fuse into the circuit, the fuse should be at the battery. For an arrow board with a power-tilt frame, use a 30-amp fuse; otherwise, use a 5-amp fuse.

    c. Route the power cable from the arrow board to the power supply. DO NOT connect the cable to power yet.

    d. Check all wiring connections and fasteners, ensuring no wiring will come loose during operation.

    e. Connect the power cable from the arrow board to the power supply according the vehicle manufacturer's instructions.

    f. Plug the power cable from the controller into the truck's power outlet/cigar lighter. If the truck does not have a power outlet, then the controller must be wired to a power supply, usually the truck's 12-volt system, according to the truck manufacturer's instructions. If wiring a fuse into the power circuit, use a 2-amp fuse. If necessary, contact the factory for an appropriate power cable (see Section 1.6, "Where to obtain service," page 5).

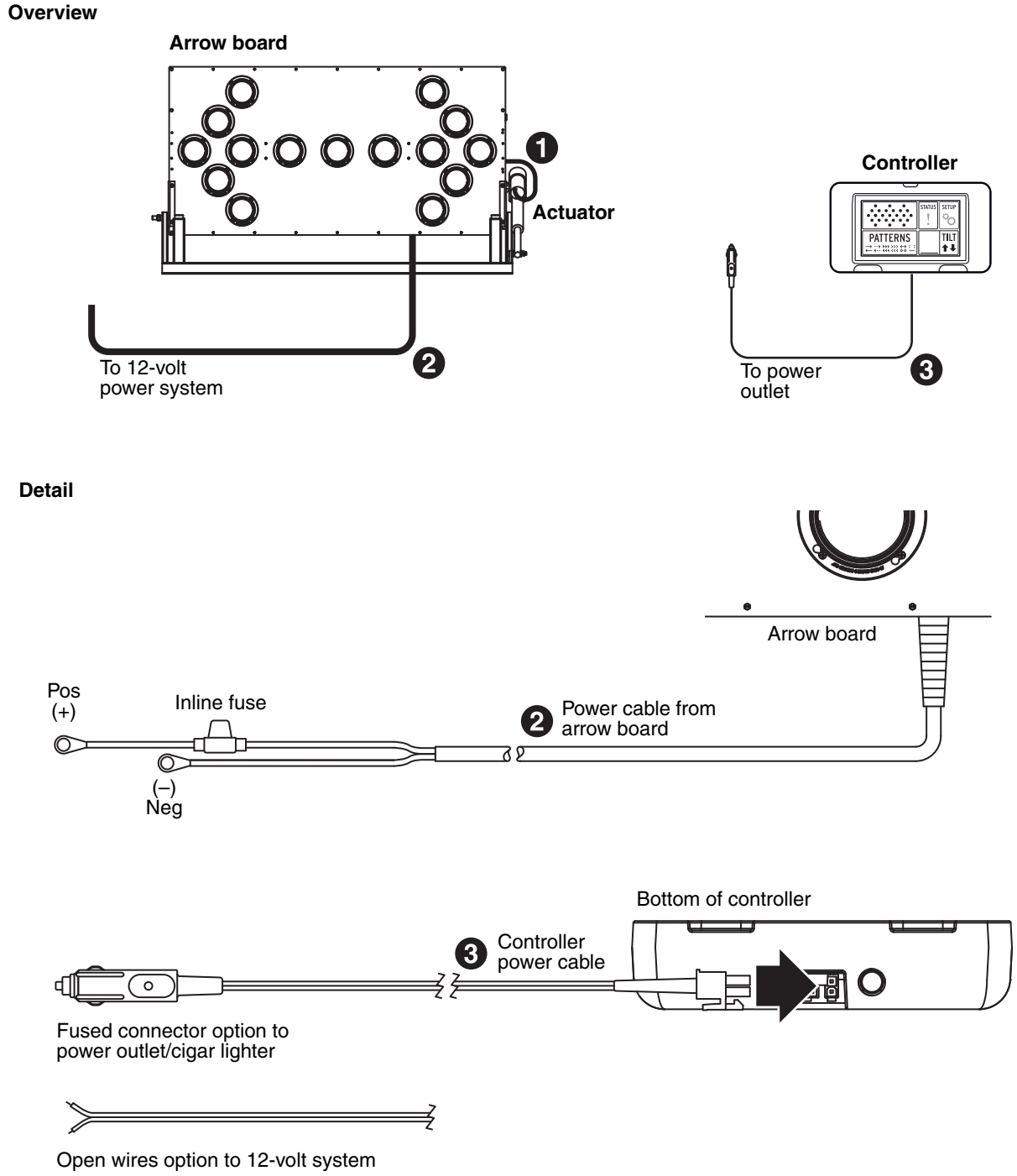
Step 5: Pairing a wireless controller

For a wireless controller and wireless arrow board to communicate with each other, they must be paired.

- When a wireless arrow board is shipped with a controller from the factory, the controller and arrow board are paired and ready to use.
- If the controller and arrow board are not paired, you must pair them before operating the arrow board.
- A wireless controller can only be paired to one arrow board at a time.

For pairing instructions, see page 28.

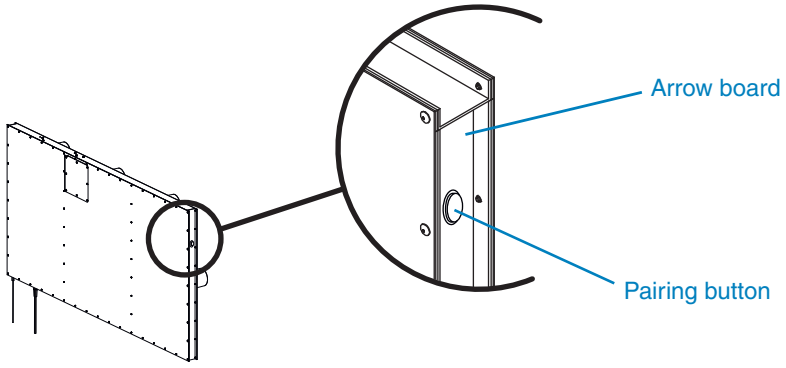
Figure 4-4. System wiring for wireless controllers



Follow these steps to pair the wireless controller and arrow board:

1. Ensure power to the arrow board is on.
2. Ensure the controller is on by tapping the screen, or press and release the on/off button. If the touchscreen remains blank, then press and hold the on/off button for three seconds.
3. On the touchscreen, press the **SETUP** button to view the **PAIR** button.
4. If the **PAIR** button reads **PAIRED**, then the controller is already paired. Skip to Step 9.
5. Press and hold the **PAIR** button for five seconds (it will blink while being held). When you release the button, the controller will search for the arrow board.
6. Locate the pairing button on the arrow board (see Figure 4-5).
7. Press and hold the arrow board pairing button for five seconds until all of the lights on the arrow board start flashing.
8. Once the controller establishes a connection to the arrow board, the **PAIR** button on the screen changes to **PAIRED**.
9. Test the connection by setting a pattern on the arrow board (see Section 5.3, page 34).

Figure 4-5. Arrow board pairing button



Step 6: Completing the installation

The arrow board is now operational. If necessary, use the controller to raise the arrow board part way, then install the remaining sets of bolts, nuts, and washers in the mounting frame.

The arrow board is always on when powered, regardless of whether the arrow board is showing a pattern (an arrow or caution pattern). For operating instructions, see Section 5.

IMPORTANT!

It is important to understand when the arrow board and controller are drawing power from the power system. Before operating the arrow board, review Section 5.1.2, page 30.

5 Operation

5.1 Before you begin

5.1.1 Safety

⚠ WARNING

Improper display could cause a traffic accident resulting in severe injury or death.

- Visually inspect arrow board to ensure correct pattern is displayed.
- Verify arrow board is fully upright and visible to traffic while in use.

⚠ WARNING

Contact with overhead obstructions could result in equipment damage, severe injury, or death.

Avoid driving under low-hanging obstructions while the arrow board is onboard the vehicle.

IMPORTANT!

It is important to understand when the arrow board and controller are drawing power from the power system. Before operating the arrow board, refer to Section 5.1.2, page 30.

- Before operating the arrow board, read and follow all safety instructions in Section 2, page 7.
- Adhere to all local regulatory codes when using the arrow board.
- Safe use of the arrow board is the responsibility of the operator.
- The arrow board may add height to the vehicle, even when in the travel (horizontal) position. Contact with overhead obstructions such as signs, bridges, wires, garage doors, and tree limbs could damage the arrow board and the vehicle, and could cause injury or death if people or traffic are nearby.
- For safe vehicle speed, consider the following:
  - ☐ Wanco Truck-Mount Arrow Boards are designed for use at typical highway speeds when properly installed and operated. Many factors contribute to safe operation of the vehicle while the arrow board is deployed (in the vertical position), regardless of vehicle speed—including vehicle size and weight, size of the board, the relative

sizes of the board and vehicle, height of the board, and quality of the installation. Maximum safe vehicle speed with the arrow board deployed should be at the recommendation of the vehicle upfitter or arrow board installer.

- ☐ Deploying the arrow board (i.e., changing its position from horizontal to vertical) while the vehicle is moving will increase stress on the power-tilt actuator and mounting system due to increased wind resistance. Likewise, in the deployed (vertical) position, wind resistance increases as the vehicle speeds up, increasing stress on the mounting system and support structure.
- ☐ Use care when deploying the arrow board while the vehicle is moving, and when traveling at high speeds while the arrow board is deployed. Before operating the vehicle, always check the condition of the arrow board and its mounting frame, support structure, power-tilt actuators, and wiring for potential failures. Ensure pivot points are in good condition, including nuts, bolts, etc.

5.1.2 Power usage

IMPORTANT!

The arrow board continues to draw power from the power system even when it appears to be off. Additionally, a wireless controller might appear to be off, but could actually be on. Therefore, if the power supply is active, the battery may be drained unless it is being actively charged.

In cases where battery power is being supplied to the arrow board system but the battery is not being actively charged, such as when the truck's 12-volt system provides power and the truck engine is off:

- The battery charge will be drained quickly by an arrow board with a power-tilt frame if the tilt frame actuator is operating and the arrow board is moving up or down. The actuator does not draw power unless it is in use.
- The battery charge will be drained slowly by an arrow board that is showing a display pattern (an arrow or caution pattern). The lights on the arrow board draw a negligible amount of power.
- The battery charge will be drained slowly by a connected arrow board, because connected arrow boards are always on, regardless of whether they are showing a display pattern. For more about connected arrow boards, see Section 5.5, page 37.
- The battery charge will be drained slowly by a wireless controller that is on or in sleep mode. In sleep mode, the touchscreen is blank, and the controller appears to be off, but it is actually on and drawing power.

5.2 Wired controllers

Depending on the arrow board model, the controller includes the components called out in the following illustrations:

- For 25-light arrow boards, see Figure 5-1.
- For 15-light arrow boards with flashing- and sequential-pattern capability, see Figure 5-2.

Figure 5-1. 12-pattern controller for 25-light arrow boards

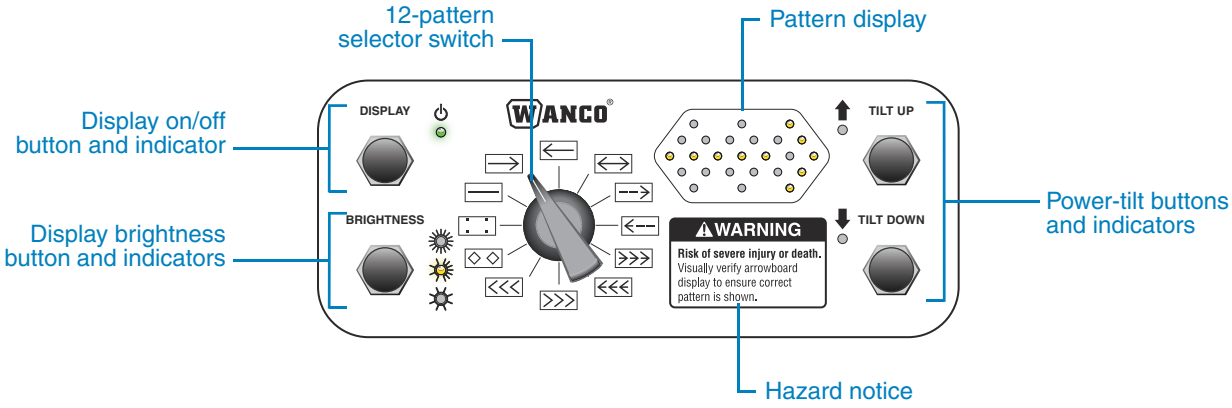
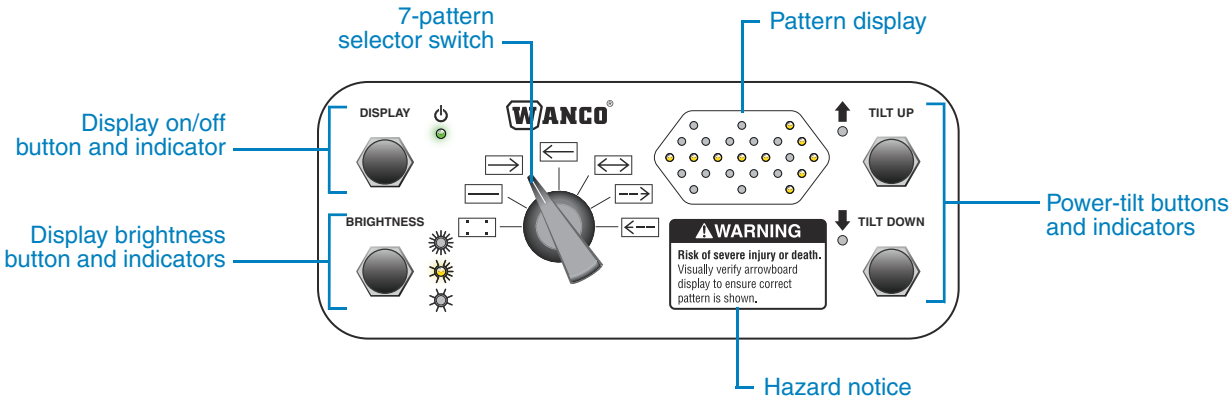


Figure 5-2. 7-pattern controller for 15-light arrow boards



5.2.1 Power on/off

To switch the arrow board display on or off, press and hold the DISPLAY button for three seconds. The display on/off LED indicator is lit when the arrow board shows an arrow or caution pattern.

IMPORTANT!

It is important to understand when the arrow board and controller are drawing power from the power system. Before operating the arrow board, refer to Section 5.1.2.

5.2.2 Pattern selection and display

To choose a display pattern for the arrow board, rotate the pattern selector switch to the desired pattern. To blank the display, switchthe controller off (see Section 5.2.1, page 31). For examples of all available patterns, see Figure 1-1, page 3.

The LED pattern display on the controller shows the selected pattern while power is on. The flashing of the LED display mimics the flashing of the arrow board. However, if the arrow board experiences a failure (e.g., if a light is broken), the LED display on the controller will not reflect the failure.

- If a 25-light controller is attached to a 15-light arrow board, only the first 7 settings will work.
- Always visually inspect the arrow board after selecting a pattern.

5.2.3 Tilt up and tilt down

If the arrow board is equipped with an electrically powered tilt frame, press the tilt buttons to raise and lower the arrow board while power is on.

The arrow board should be down (horizontal) when it is not in use.

The tilt buttons can be set to manual- or auto-stop mode. See “Tilt modes” below. The tilt indicator is lit while the arrow board is moving. The controller does not indicate the angle of the arrow board.

For an arrow board with a 180-degree power-tilt frame, the tilt buttons on the controller allow you to operate the tilt frame continuously, so the arrow board can face forward, rearward, or down when it is not in use.

When the arrow board reaches the end of its range of motion, the electric actuator makes a clicking or ratcheting sound. This sound is normal and is not an indication of damage to the actuator. When you hear this sound, release the button (in automatic mode, the actuator stops after a few seconds).

Tilt modes

Manual stop

In manual stop mode, the tilt frame will move only while you are pressing the tilt button. When you take your finger off the button, the tilt frame stops moving.

To set the tilt mode to manual stop:

1. Press and hold both the BRIGHTNESS and TILT DOWN buttons for five seconds.
2. When the BRIGHTNESS LEDs stop cycling, release both buttons.
3. Test the tilt mode by pressing a tilt button to raise or lower the arrow board.

Auto stop

In the auto stop mode, the tilt frame will begin to move when you press and release the tilt button, and will continue to move until the tilt frame reaches the limit of its range of motion.

⚠ CAUTION

Crush hazard.

While tilting the arrow board in auto-stop mode:

- Keep hands and body parts clear of pinch points.
- To stop the arrow board, press and release the DISPLAY button.

To set the tilt mode to auto stop:

1. Press and hold both the BRIGHTNESS and TILT UP buttons for five seconds.
2. When the BRIGHTNESS LEDs stop cycling, release both buttons.
3. Test the tilt mode by pressing a tilt button to raise or lower the arrow board.

Emergency stop

In auto-stop mode, stop the arrow board tilt motion by pressing the TILT button. Press it again to continue the tilt cycle.

5.2.4 Brightness

The controller has three brightness settings:

Dim	For nighttime use or when daylight glare is low
Bright	For daytime use and when daylight glare is high
Auto-brightness	For an arrow board equipped with a photocell, automatically adjusts display brightness based on ambient light: dim at night and bright during the day For an arrow board that does not have a photocell, this setting behaves the same as the Dim setting For photocell location, see Figure 7-1, page 43

The BRIGHTNESS button changes the display brightness each time the button is pressed, cycling through the three settings listed above. An LED indicator on the controller identifies the selected setting.

5.3 Wireless controller

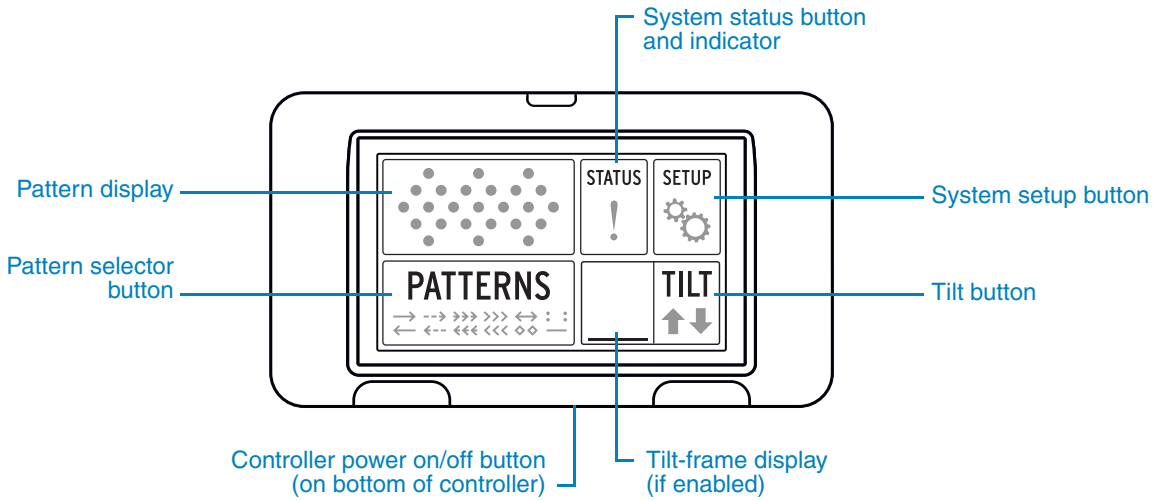
5.3.1 Overview

The wireless arrow board controller (Figure 5-3) is a smart controller that "knows" the arrow board it is connected to and shows you only the functions available for that board.

When a wireless arrow board is shipped with a controller from the factory, the controller and arrow board are electronically "paired" and ready to use. If the controller and arrow board are not paired, you cannot use the wireless controller to operate the arrow board. For pairing instructions, see Step 5 on page 26.

- For pattern display selection and power-tilt operation, see the following pages.
- For complete instructions, see the wireless controller user's manual.

Figure 5-3. Wireless controller, main screen



5.3.2 Power on/off

Wireless controllers have a white on/off button on the bottom of the controller. To turn the controller on or off, press and hold the button for three seconds.

5.3.3 Sleep mode

Wireless controllers have a sleep mode, in which the controller is on and ready to be used, but its touchscreen display is blank.

- To enter sleep mode, press and release (do not hold) the power on/off button.
- To exit sleep mode, touch the screen or press and release the on/off button.

  If touching the screen does not activate it, then the controller is off. Press and hold the on/off button for three seconds to turn it back on.

5.3.4 Pattern selection and display

To choose a display pattern for the arrow board, press the **PATTERNS** button and then press a button for the desired pattern or to blank the arrow board. For examples of all available patterns, see Figure 1-1, page 3.

The pattern display shows the selected pattern. If the arrow board is blank, the pattern display is black. The flashing of the pattern display mimics the flashing of the arrow board. However, if the arrow board experiences a failure (e.g., if a light is broken), the pattern display on the controller will not indicate the failure.

Always visually inspect the arrow board after selecting a pattern.

5.3.5 Tilt

If the arrow board is equipped with an electrically powered tilt frame, and the controller is properly configured, you can raise and lower the arrow board using the Tilt screen on the controller. Press the **TILT** button to view the Tilt screen. For complete instructions, see the wireless controller user's manual.

The arrow board should be down (horizontal) when it is not in use.

The tilt-frame display on the controller's Main screen indicates the tilt position, up or down, if it is known by the controller.

For an arrow board with a 180-degree power-tilt frame, the arrow buttons on the Tilt screen allow you to operate the tilt frame continuously, so the arrow board can face forward, rearward, or down when it is not in use.

When the arrow board reaches the end of its range of motion, the electric actuator makes a clicking or ratcheting sound. This sound is normal and is not an indication of damage to the actuator. When you hear this sound, release the button (in automatic mode, the actuator stops after a few seconds).

5.3.6 Status

Press the **STATUS** button to view the controller Status screens.

In the event of an alarm, the **STATUS** button will flash the alert symbol (⚠). Press the **STATUS** button to view alarms.

5.3.7 Setup

Press the **SETUP** button to access controller and arrow board configuration screens.

Pairing

Use the **PAIR** button to pair the wireless controller with a wireless arrow board. For pairing instructions, see Step 5 on page 26.

Night/day modes

Press the **NIGHT** button to dim the touchscreen display during nighttime hours.

Press the **DAY** button to brighten the touchscreen display during daytime hours.

Options

Press the **OPTIONS** button for additional setup options. For details, see the wireless controller user's manual.

Arrow board brightness

To change the arrow board brightness, press the **SETUP** button, then press one of the following buttons:

DIM	For nighttime use or when daylight glare is low
BRIGHT	For daytime use and when daylight glare is high
AUTO-BRIGHTNESS	For an arrow board equipped with a photocell, automatically adjusts display brightness based on ambient light: dim at night and bright during the day For an arrow board that does not have a photocell, this setting behaves the same as the DIM setting For photocell location, see Figure 7-1, page 43

5.4 Tilt frames

5.4.1 Power operated

For an arrow board with a factory power-tilt frame, use the arrow board controller to operate the tilt mechanism. For a wired controller, see Section 5.2.3, page 32. For a wireless controller, see Section 5.3.5, page 35.

For an arrow board with a factory 180-degree power-tilt frame, the controller allows you to operate the tilt frame continuously, so the arrow board can face forward, rearward, or down when it is not in use.

5.4.2 Manually operated

The Wanco Auto-Lock Frame is a manually operated tilt frame that allows the arrow board to tilt from horizontal to vertical. It has a spring-loaded pin that automatically engages to lock the frame in position at 90-degree intervals.

To tilt the arrow board on the auto-lock frame, pull the locking-pin out, away from the arrow board, and then tilt the arrow board. Release the pin when the arrow board begins to move. The pin will automatically lock the arrow board when it is tilted 90 degrees, snapping into place with an audible "click."

5.5 Connected arrow boards

5.5.1 Overview

A "connected" arrow board sends data wirelessly to the cloud, in real time, and without human interaction. The data may be shared among other connected devices, such as satellite navigation systems on smartphones and in cars and trucks. The primary purpose is to improve work zone safety.

For example, just as an arrow board might direct drivers to merge by displaying a flashing arrow, a connected arrow board may provide the same information wirelessly to a vehicle's navigation system, alerting the driver to slow down and move over.

Wanco Connected Arrow Boards communicate information about their status, including the arrow board location, the pattern being displayed, the compass bearing of the display, and more.

Many transportation departments require the use of connected arrow boards on all interstate and state highway projects.

To learn more, visit the U.S. Department of Transportation website for Work Zone Data Exchange (WZDx).

5.5.2 What you should know

- All new truck-mounted Wanco arrow boards are connected. Other models, such as trailer- and skid-mounted models may also be connected.
- Wanco provides a retrofit kit for converting older arrow boards to become connected, so some older models may also be connected.
- Connectivity uses a wireless, cellular connection. As with a mobile phone, signal strength can vary depending on the arrow board location, weather conditions, and many other factors.
- As long as the arrow board is fully deployed (in the vertical position) and has power, it is always sending data to the cloud. For more about arrow board power consumption, see Section 5.1.2, page 30.

5.5.3 What you should do

There are two actions you should take to ensure proper effectiveness of a Wanco Connected Arrow Board:

- Blank the arrow board display when it is not in use.
- Calibrate the compass if needed. See Section 7.6, page 46.

5.5.4 Wanco Fleet Manager

Wanco Fleet Manager is a fleet tracking and management service that provides remote access to Wanco traffic safety equipment. It is an optional service that may not be included with your arrow board.

Fleet Manager provides status information for connected arrow boards. For more information, contact Wanco Sales or Service (see Section 1.6, page 5).

6 Troubleshooting

6.1 Before troubleshooting

Before performing any troubleshooting or servicing on the arrow board, observe all safety precautions in Section 2, page 7.

6.2 Control system

If the arrow board is not working, no lights are lit on the control panel, and the arrow board does not respond when you use the controller:

- Ensure the arrow board has power. Check the power supply, cables, and wiring connections.
- For a wireless controller, ensure the controller has power and is switched on (see Section 5.3, page 34).
- The control system may have failed. Contact the Wanco Service Department for assistance (see Section 1.6, page 5).

6.3 Display panel

6.3.1 Display patterns not showing

If the arrow board display panel does not show the selected display pattern:

1. Ensure the power system is on.
2. If the power system is on, troubleshoot the arrow board display lights using the procedure in Section 6.3.2, page 40.
3. If the arrow board display lights are working properly, check the controller.

- For a wired controller:

   a. Ensure the LED indicators on the controller are lit.

   b. If all the lights on the controller are off, press and hold the display on/off button on the controller for three seconds.

      - The display LED indicator and the display pattern LEDs on the controller should light up. If they do not, then a cable may be loose or damaged.
      - Check the controller Cat 5 cable connections at the controller and the arrow board to ensure they are proper and secure. Check the cable for wear and damage. Replace the cable if necessary.

- For a wireless controller:

  c. Ensure the touchscreen display is on.

  d. If the touchscreen is blank, it may be in sleep mode. Tap the screen or press and release the controller power button to activate it.

  e. If the screen is still blank, press and hold the on/off button on the bottom of the controller for three seconds.

     - The touchscreen should light up. If it does not, then a cable may be loose or damaged.
     - Check the controller power cable connections at the controller and the power source to ensure they are proper and secure. Check the cable for wear and damage. Replace the cable if necessary.

4. If cables and cable connections are all good, the controller may have failed. Contact the Wanco Service Department for assistance (see Section 1.6, page 5).

6.3.2 Display lights not working

If any lights on the front or back of the arrow board display panel do not light up as expected, the most likely cause is faulty wiring or a bad wiring connection.

To check the wiring of any light on the display panel:

1. On the front of the display, remove the visor from the light (see Section 7.4, page 45).
2. Carefully remove the light from the cabinet.
3. Check its wiring connections to ensure they are proper and secure. Check wiring for wear and damage.
4. Replace wiring if necessary or contact the Wanco Service Department for assistance (see Section 1.6, page 5).

6.4 Connected systems

6.4.1 Communications failure

A Wanco Connected Arrow Board (CAB) is always sending data to the cloud as long as it is fully deployed (in the vertical position) and has power. For more information, see Section 5.5, page 37.

Connected systems are aware of the CAB location and status except when a communications failure occurs. A comm failure can be caused by:

- CAB power shutdown
- CAB cellular connection issue

If the arrow board has power and a comm failure has occurred, contact the Wanco Service Department for assistance (see Section 1.6, page 5).

6.4.2 Incorrect arrow board status

A Wanco Connected Arrow Board (CAB) is always sending data to the cloud as long as it is fully deployed (in the vertical position) and has power. For more information, see Section 5.5, page 37.

Connected systems indicate the CAB is deployed when both of the following are true:

- The CAB has power and a cellular connection to the cloud
- The CAB display panel is deployed and displaying a pattern

If a connected system, mapping app, or navigation system shows information that is different than expected, see Table 6-1.

Table 6-1. Troubleshooting CAB status errors

Connected system indicates...	Possible cause	Solution
Arrow board is showing a display pattern	Arrow board display panel is upright and showing a pattern	If the arrow board is not deployed, turn the arrow board display off (for a wired controller, see Section 5.2.1, page 31; for a wireless controller, see Section 5.3.4, page 35)
Arrow board is facing the wrong direction	Arrow board compass is out of calibration	Calibrate the compass (see Section 7.6, page 46)
Arrow board is not shown or arrow board notifications are not shown	Arrow board display is blank	If the arrow board is deployed, use the controller to select a display pattern and turn the arrow board display on (for a wired controller, see Section 5.2, page 31; for a wireless controller, see Section 5.3, page 34)
	Arrow board is in travel or stowed position	Raise the arrow board to the deployed (vertical) position
	GPS location is off road or geofencing is in place	Check the actual location of the arrow board in person and compare with the indicated GPS location; move the arrow board if needed Check for geofencing in Wanco Fleet Manager*
	Cellular signal is blocked	Arrow board is next to a large building, under a bridge, or otherwise obstructed; remove the obstruction or move the arrow board to an open location
	Communications failure	Contact the factory (see Section 1.6, page 5)
	System power shutdown	Turn on power to the system
	Arrow board is not a connected model (CAB)	Replace the non-connected arrow board with a CAB model or install a CAB retrofit kit

**Wanco Fleet Manager is an optional service that may not be included with your arrow board. See Section 5.5.4, page 37.*

7 Maintenance

7.1 General maintenance

When performing any maintenance on the system, follow the safety requirements in Section 2, page 7.

⚠ WARNING

If the arrow board is not working properly, a traffic accident could occur, resulting in serious injury or death.

After maintenance, before sending the arrow board back into service, verify all display lights are functioning properly.

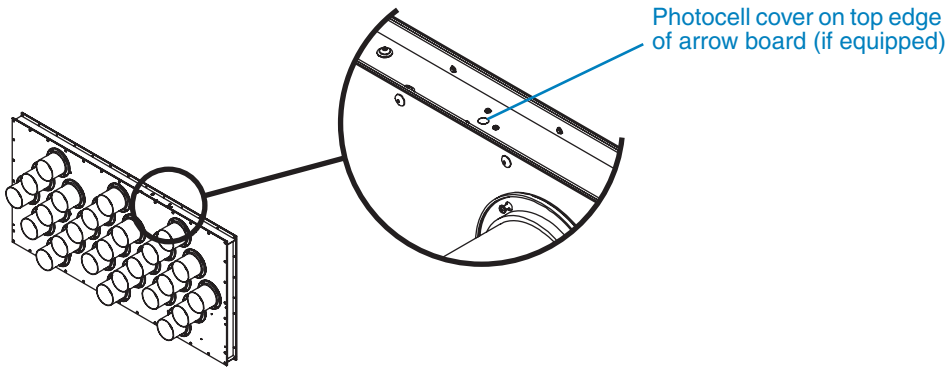
⚠ CAUTION

During maintenance, adverse weather conditions can cause equipment damage and injury.

Whenever possible, perform maintenance indoors or in calm dry weather, and away from traffic.

- Always be aware of traffic when performing roadside maintenance.
- Repair or replace worn and damaged components immediately. Never use any equipment that is damaged or in need of repair.
- For reliable performance, keep the arrow board and all its components clean.
- If the arrow board has a photocell (see Figure 7-1), keep the photocell cover clean. Use a soft, damp cloth.

Figure 7-1. Photocell location



7.2 Periodic maintenance

When performing any maintenance on the system, follow the safety requirements in Section 2, page 7.

- The arrow board display has 25 or 15 LED lights.
  - ☐ Check the display lights for proper operation.
  - ☐ Replacement lights are available from the factory (see Section 1.6, "Where to obtain service," page 5).
  - ☐ To replace a light, see Section 7.4.
- At least once a week:
  - ☐ Check external cables and wires for signs of wear or damage. Repair or replace cables and wires when worn or damaged.
  - ☐ If the arrow board is installed on a tilt frame, check pivot points and moving parts for wear and damage. Repair or replace as needed.
- At least once a month:
  - ☐ Check all mounting brackets, including nuts and bolts, to ensure they are properly tightened and secure. Tighten, repair, or replace as needed.
  - ☐ Check all screws that attach visors over LED lights on arrow board display. Screws can loosen over time. Tighten whenever necessary.

7.3 Lubrication

When performing any maintenance on the system, follow the safety requirements in Section 2, page 7.

To lubricate moving parts, use any common lubrication grease.

The lubrication schedule may vary depending on location, application, and frequency of use. Follow the schedule listed in Table 7-1 or set a more frequent schedule if needed for your arrow board and your application.

Table 7-1. Lubrication schedule

Frequency	Instructions
At least weekly	If the arrow board is installed on a tilt frame with an electric actuator, lubricate the actuator's top and bottom pivot points.
At least monthly	If the arrow board is installed on a tilt frame, lubricate the pivot points.
As needed	Lubricate all other moving parts
Always	Wipe away any extra or spilled grease

7.4 Replacing a light or visor

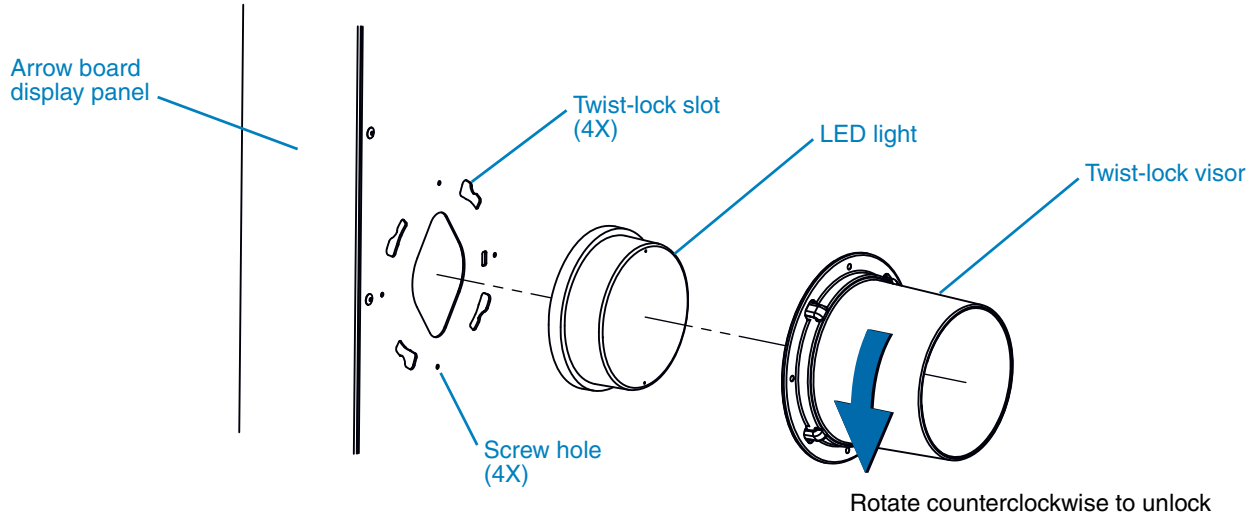
Visors secure the lights to the front of the arrow board display panel.

- To replace a light, you must first remove its visor.
- Wanco's twist-lock visors do not require screws to hold them in place, but screws may be used if desired.

To replace an LED light or visor on the arrow board display, refer to Figure 7-2 and follow these steps:

1. Follow the safety requirements in Section 2, page 7.
2. Shut off power to the arrow board, either by using the controller, by shutting off the vehicle engine, or by disconnecting its power supply.
3. If screws are holding the visor in place, loosen the screws.
4. Either by grasping the visor tightly or using a standard strap wrench, rotate the visor counterclockwise about an inch (2.5cm) to unlock it. Avoid pulling the visor out from the display panel while rotating.
5. When the visor is unlocked, gently pull it away from the panel. The light will be loose when you remove the visor. Hold the light in place and use care not to let it fall.
6. If replacing a light, gently pull the light away from the display panel and disconnect its wiring, then reverse the procedure to install the new light and its visor.
7. If replacing a visor, reverse the procedure to install a replacement. When installing a new Wanco twist-lock visor, screws are not necessary but may be used if desired.

Figure 7-2. Twist-lock visor detail

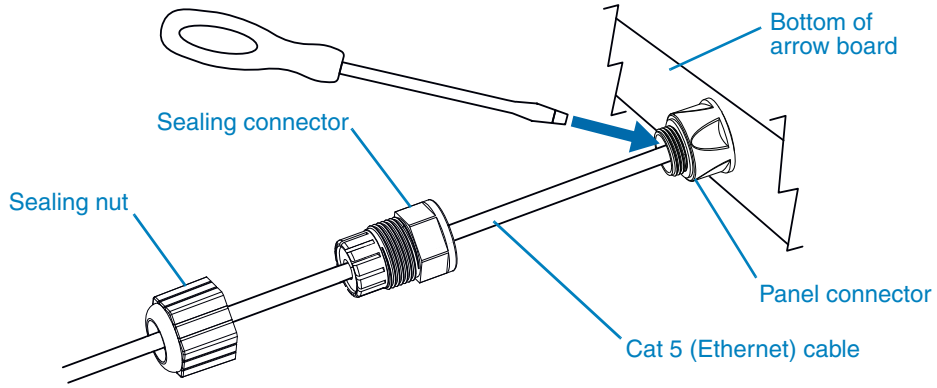


7.5 Cat 5 cable removal

If the wired controller's Cat 5 (Ethernet) cable needs to be removed from the arrow board (e.g., for troubleshooting or replacement), refer to Figure 7-3, and follow these steps:

1. Unscrew the sealing nut and remove it from the sealing connector.
2. Unscrew the sealing connector and remove it from the panel connector.
3. The Cat 5 cable plug is connected to the RJ45 jack inside the sealing connector. Use a small flat-blade screwdriver to push down the tab on the plug, then gently pull the plug out from the sealing connector.
4. For installation, reverse these steps or refer to Figure 4-2, page 23.

Figure 7-3. Cat 5 cable removal



7.6 Compass calibration

7.6.1 Overview

Wanco Connected Arrow Boards include a built-in electronic compass, which they use to pass their compass bearing (i.e., the direction they are facing) to connected systems, such as the Waze® app and other mapping apps. (For more about connected arrow boards, see Section 5.5, page 37.)

Connected systems use the arrow board compass bearing—north, south, east, west, and points between—to communicate the direction the arrow board is facing. This enables receiving devices, such as a phone or car, to accurately represent the arrow board location and orientation for mapping, navigation, and vehicle alert systems.

- The compass is calibrated at the factory and does not normally require field calibration.
- The compass can come out of calibration, in which case field calibration is necessary.

7.6.2 Determining whether calibration is required

You can verify whether the compass is properly calibrated:

- First, view the arrow board in person and determine which direction it is facing. Then check the compass bearing virtually by viewing the arrow board location either on a compatible connected system or in Wanco Fleet Manager. (Wanco Fleet Manager is an optional service that may not be included with your arrow board. See Section 5.5.4, page 37).
- If the connected system or Fleet Manager indicates the arrow board is facing a different direction than it is actually facing, then the compass requires calibration.

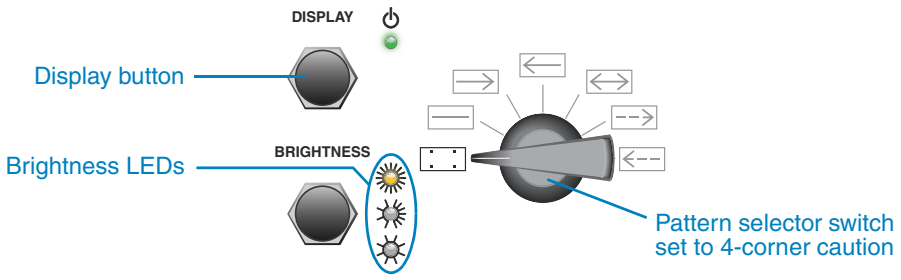
IMPORTANT!

You should calibrate the compass if it is out of calibration.

7.6.3 Calibration procedure

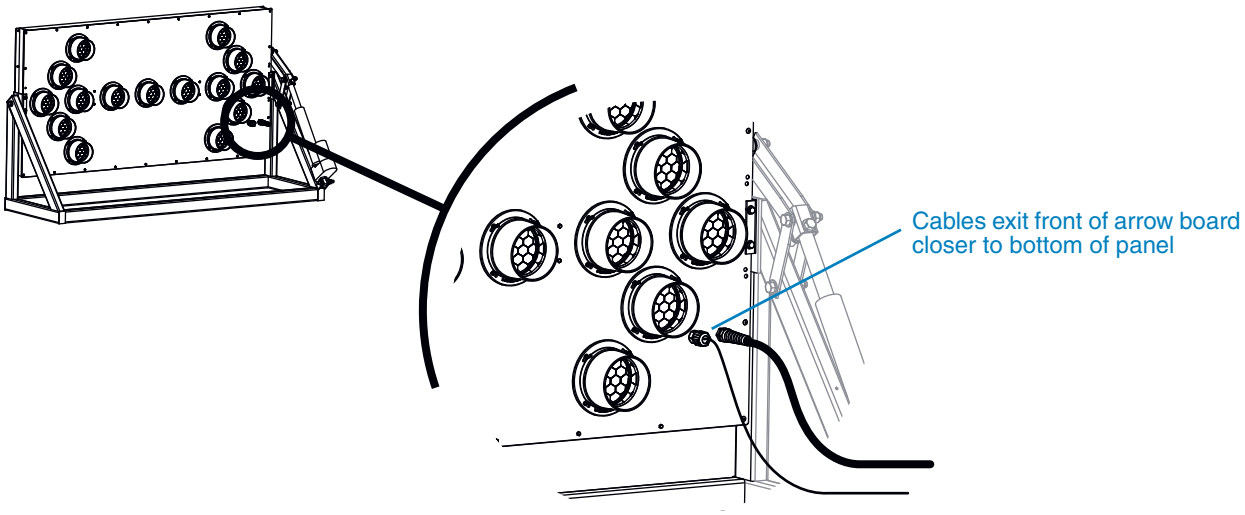
- To calibrate the compass using a wireless controller, see the wireless controller user's manual.
- To calibrate the compass using a wired controller, refer to Figure 7-4 and follow the steps below.

Figure 7-4. Controls for compass calibration



1. Follow the safety requirements in Section 2, page 7.
2. The arrow board must be oriented correctly before starting the calibration process:
   - Ensure the arrow board display panel is fully deployed and upright (vertical), with the power and Cat 5 cables coming out the bottom.
   - If the arrow board is installed on a 180-degree power-tilt frame, such that it can tilt to face either forward or rearward, set the arrow board in its default position, with the power and Cat 5 cables closer to the bottom of the arrow board than the top. See Figure 7-5, page 48.

Figure 7-5. 180-degree frame default position



3. Position the vehicle so the arrow board display panel faces due north (zero degrees). For accuracy, use an analog or digital compass, or a smartphone app.
4. On the controller, ensure the DISPLAY indicator light and the pattern display are off. If they are on, press and hold the DISPLAY button for three seconds to turn off the display.
5. On the controller, set the pattern selector switch to the four corner caution pattern ( ).
6. Turn on the system by pressing and holding the DISPLAY button for three seconds. Ensure the arrow board display is turned on, and LEDs on the controller are flashing.
7. Begin the calibration process by pressing and releasing the DISPLAY button five times within three seconds.

   The BRIGHTNESS LED indicators will flash sequentially, one at a time, in a "waterfall" pattern, indicating the system has started calibrating for north.

   When the north calibration is complete, the waterfall pattern flashes slowly.
8. The slow flash continues for the next 10 minutes. During this time, reposition the arrow board display panel so that it faces due south (180 degrees). For accuracy, use an analog or digital compass, or a smartphone app. This requires repositioning the vehicle on which the arrow board is installed.

IMPORTANT!

If the arrow board is on a 180-degree tilt frame, do not change its position by activating the frame. Instead, you must reposition the vehicle.

9. Ensure the indicators on the controller are still slowly flashing the waterfall pattern. Then, as you did in Step 7, press and release the DISPLAY button five times within three seconds.

   The waterfall pattern flashes quickly, indicating the system has started calibrating for south.

   When the south calibration is complete, the three BRIGHTNESS indicators stop flashing, indicating that the calibration procedure is complete.

10. If storing the arrow board or taking it out of service, press and hold the DISPLAY button for three seconds to turn off the arrow board display panel.

11. If returning the arrow board to service:

    a. Use the controller to select the desired display pattern and turn on the arrow board display panel.

    b. Visually inspect the arrow board to ensure the correct arrow pattern is displayed.

⚠ WARNING

Improper display could cause a traffic accident resulting in severe injury or death.

Visually inspect arrow board to ensure correct arrow pattern is displayed.

7.7 Storing the arrow board

IMPORTANT!

It is important to understand when the arrow board and controller are drawing power from the power system. Before storing the arrow board, refer to Section 5.1.2, page 30.

Before storing the arrow board:

- For a wired controller, switch off the controller to blank the arrow board display (see Section 5.2, page 31.)
- For a wireless controller, turn off the controller to blank the arrow board display (see Section 5.3, page 34).

7.8 Wiring

Before performing any type of service or maintenance, read and observe all safety instructions. See Section 2, page 7.

For wiring diagrams, contact the Wanco Service Department. See Section 1.6, “Where to obtain service,” page 5.

7.9 Replacement parts

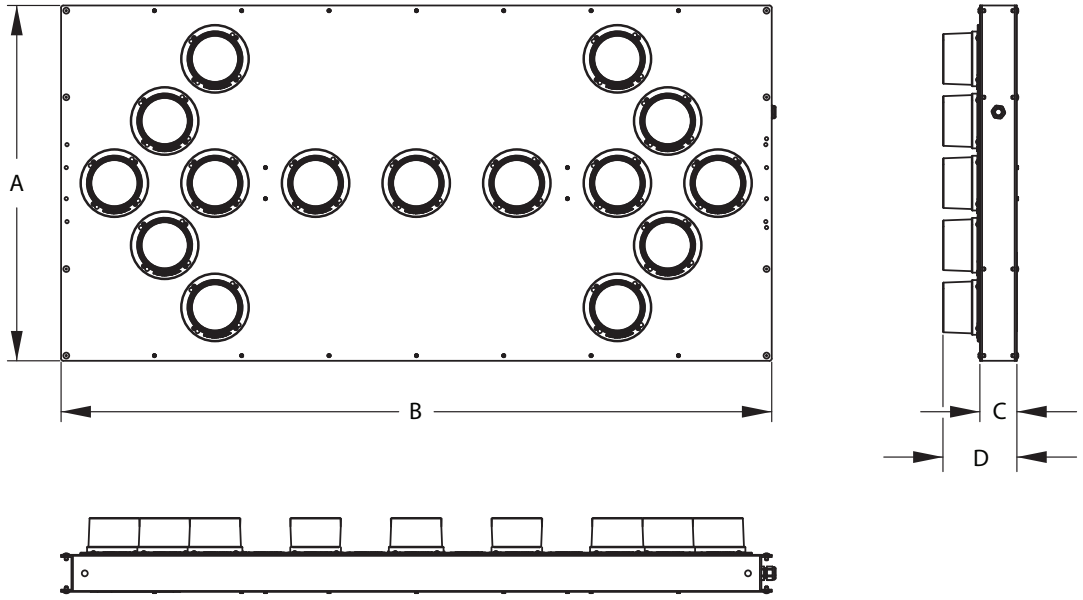
Before performing any type of service or maintenance, read and observe all safety instructions. See Section 2, page 7.

For replacement parts, contact the Wanco Service Department (see Section 1.6, “Where to obtain service,” page 5).

Appendix
A Sizes and Dimensions

A.1 Arrow boards

Figure A-1. Arrow board without mounting frame



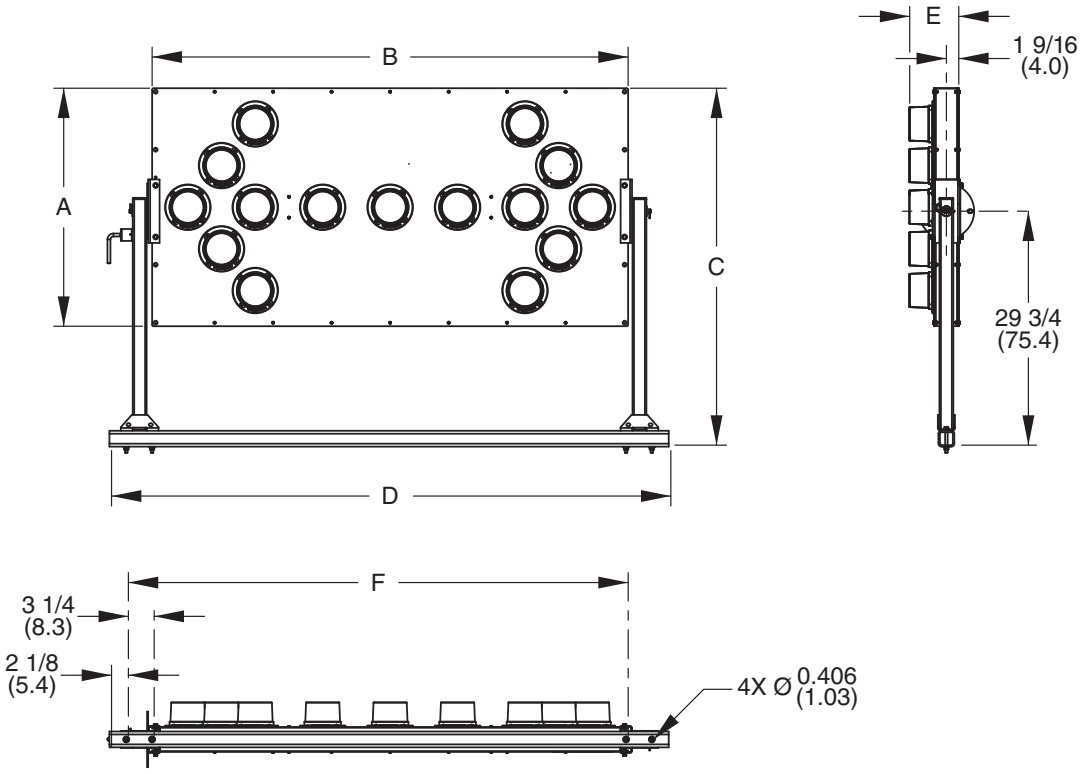
Dimensions in inches (cm)

Arrow board size	A	B	C	D	Weight, approx. lbs. (kg)
30×60	30 (76.2)	60 (152.4)	3 1/8 (7.9)	6 3/16 (15.8)	72 (33)
36×72	36 (91.4)	72 (182.8)	3 1/8 (7.9)	8 1/4 (21.0)	100 (45)
48×96	48 (121.9)	96 (243.8)	3 1/8 (7.9)	8 1/4 (21.0)	112 (51)

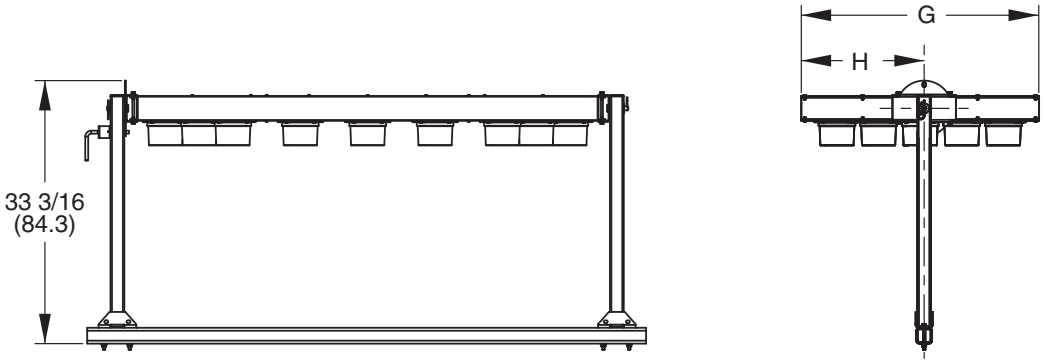
Figure A-2. Arrow board with manual-tilt (auto lock) frame

Dimensions in inches (cm)

Deployed



Travel position

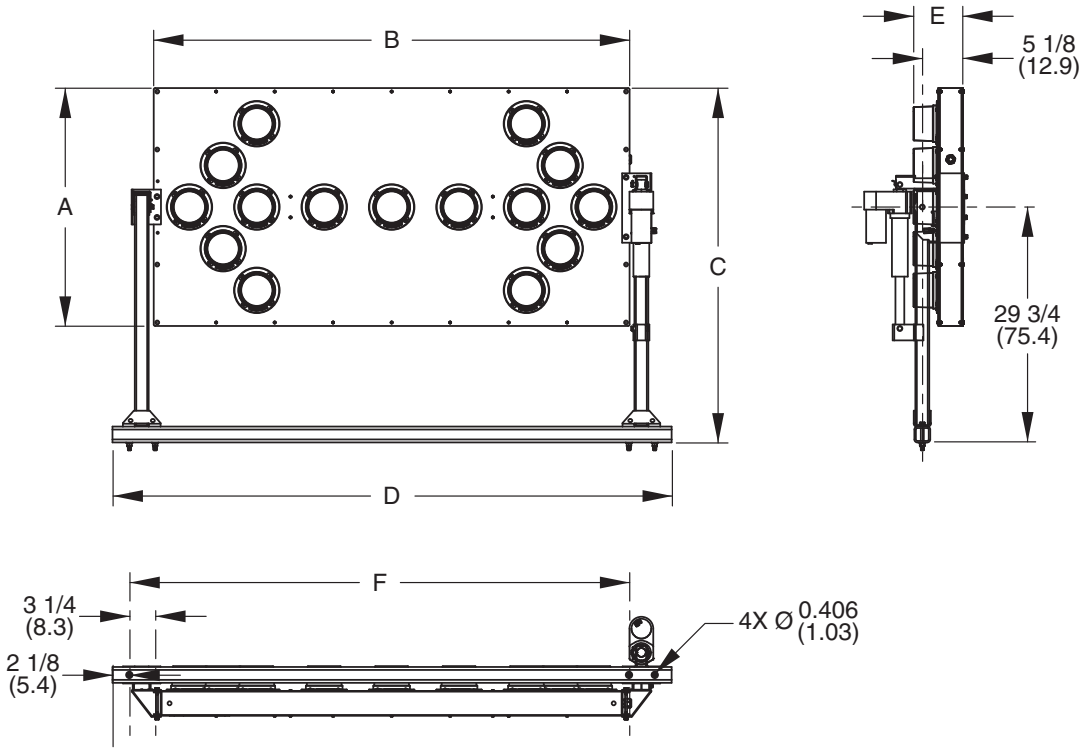


Arrow board size	A	B	C	D	E	F	G	H	Weight, approx. lbs. (kg)
30×60	30 (76.2)	60 (152.4)	44 3/4 (113.7)	70 1/2 (179.1)	6 3/16 (15.8)	63 (160.0)	30 (76.2)	15 (38.1)	122 (55)
36×72	36 (91.4)	72 (182.8)	47 3/4 (121.3)	82 1/2 (209.6)	8 1/4 (21.0)	75 (190.5)	36 (91.4)	18 (45.7)	150 (67)
48×96	48 (121.9)	96 (243.8)	53 3/4 (136.5)	106 1/2 (270.5)	8 1/4 (21.0)	99 (251.5)	48 (121.9)	24 (60.9)	162 (73)

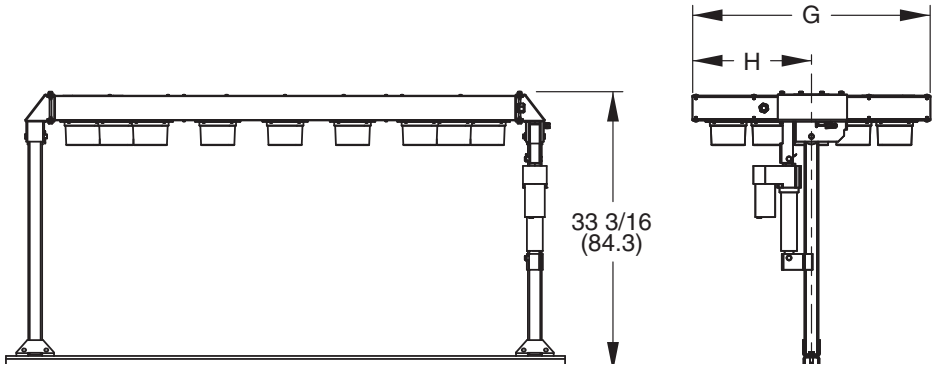
Figure A-3. Arrow board with 90-degree power-tilt frame

Dimensions in inches (cm)

Deployed



Travel position

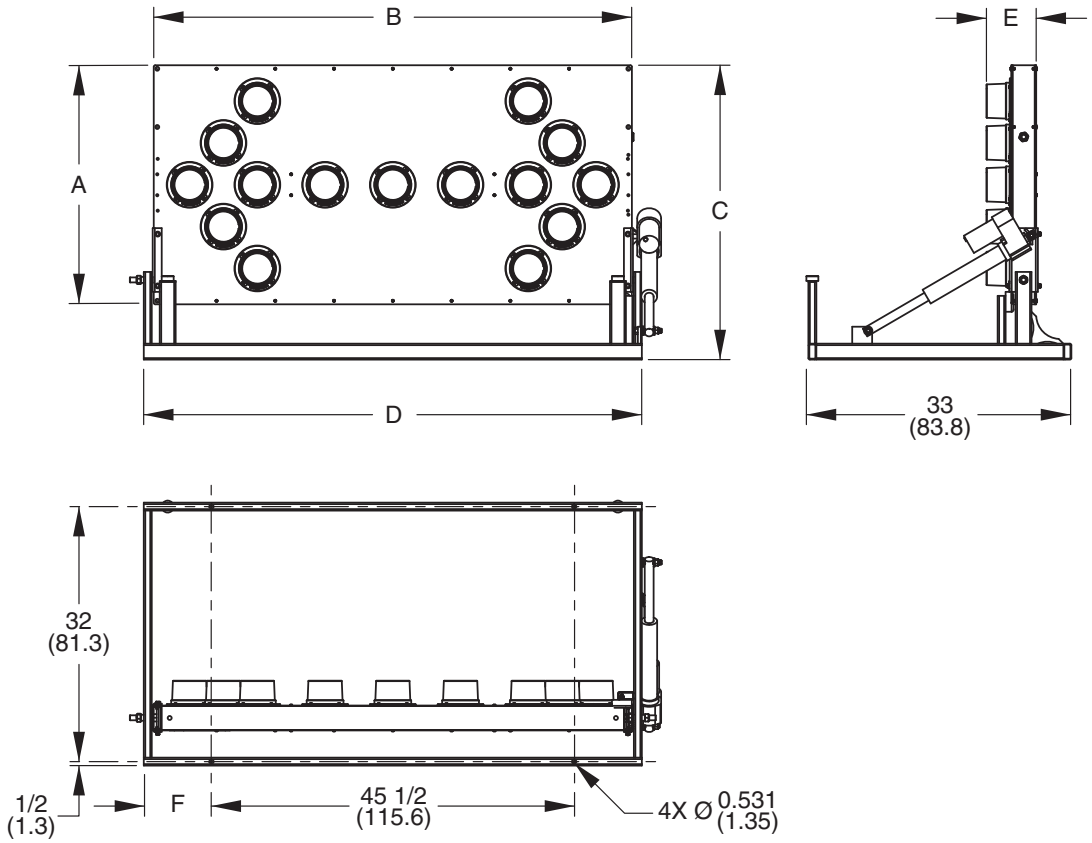


Arrow board size	A	B	C	D	E	F	G	H	Weight, approx. lbs. (kg)
30×60	30 (76.2)	60 (152.4)	44 3/4 (113.7)	70 1/2 (179.1)	6 3/16 (15.8)	63 (160.0)	30 (76.2)	15 (38.1)	142 (65)
36×72	36 (91.4)	72 (182.8)	47 3/4 (121.3)	82 1/2 (209.6)	8 1/4 (21.0)	75 (190.5)	36 (91.4)	18 (45.7)	170 (77)
48×96	48 (121.9)	96 (243.8)	53 3/4 (136.5)	106 1/2 (270.5)	8 1/4 (21.0)	99 (251.5)	48 (121.9)	24 (60.9)	182 (83)

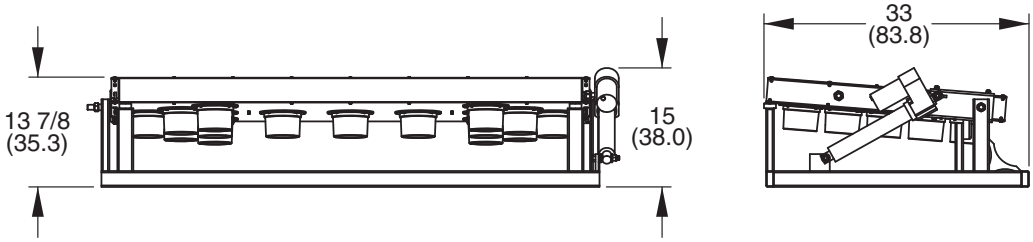
Figure A-4. Arrow board with 90-degree low-profile power-tilt frame

Dimensions in inches (cm)

Deployed



Travel position

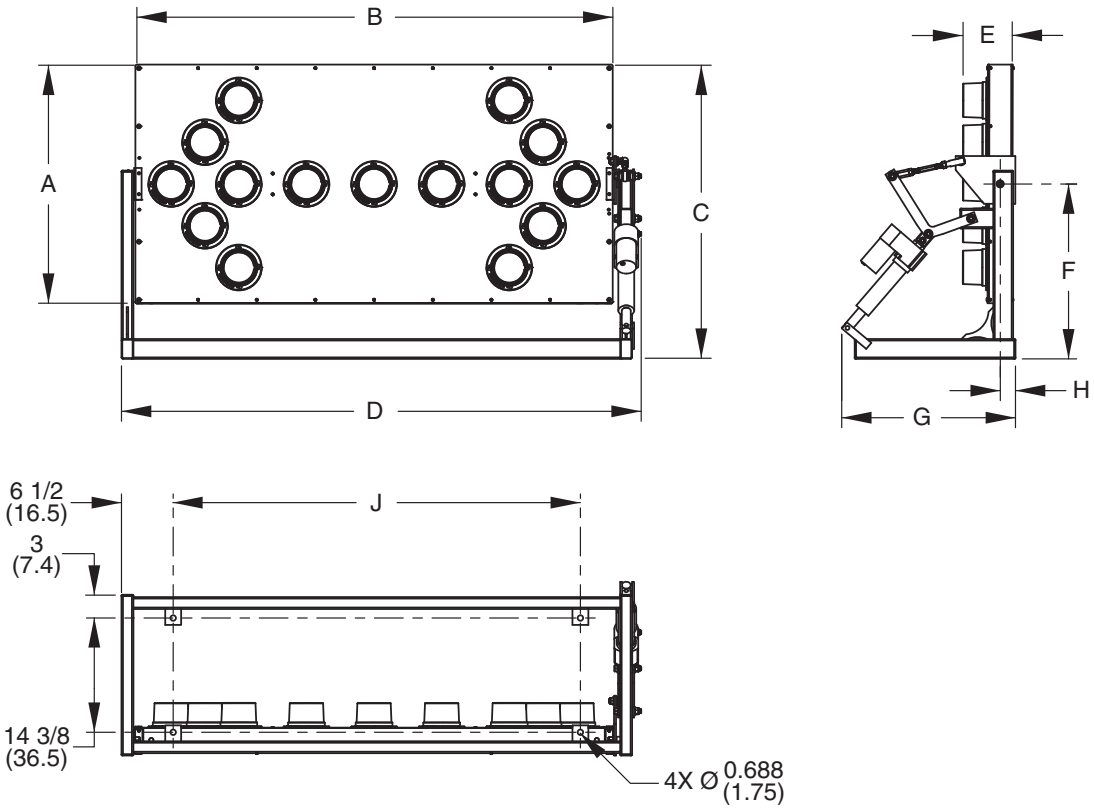


Arrow board size	A	B	C	D	E	F	Weight, approx. lbs. (kg)
30×60	30 (76.2)	60 (152.4)	37 (94.0)	62 1/2 (158.8)	6 3/16 (15.8)	8 1/2 (21.6)	132 (60)
36×72	36 (91.4)	72 (182.8)	39 (99.1)	74 1/2 (189.2)	8 1/4 (21.0)	14 1/2 (36.8)	160 (72)

Figure A-5. Arrow board with 180-degree power-tilt frame

Dimensions in inches (cm)

Rear facing

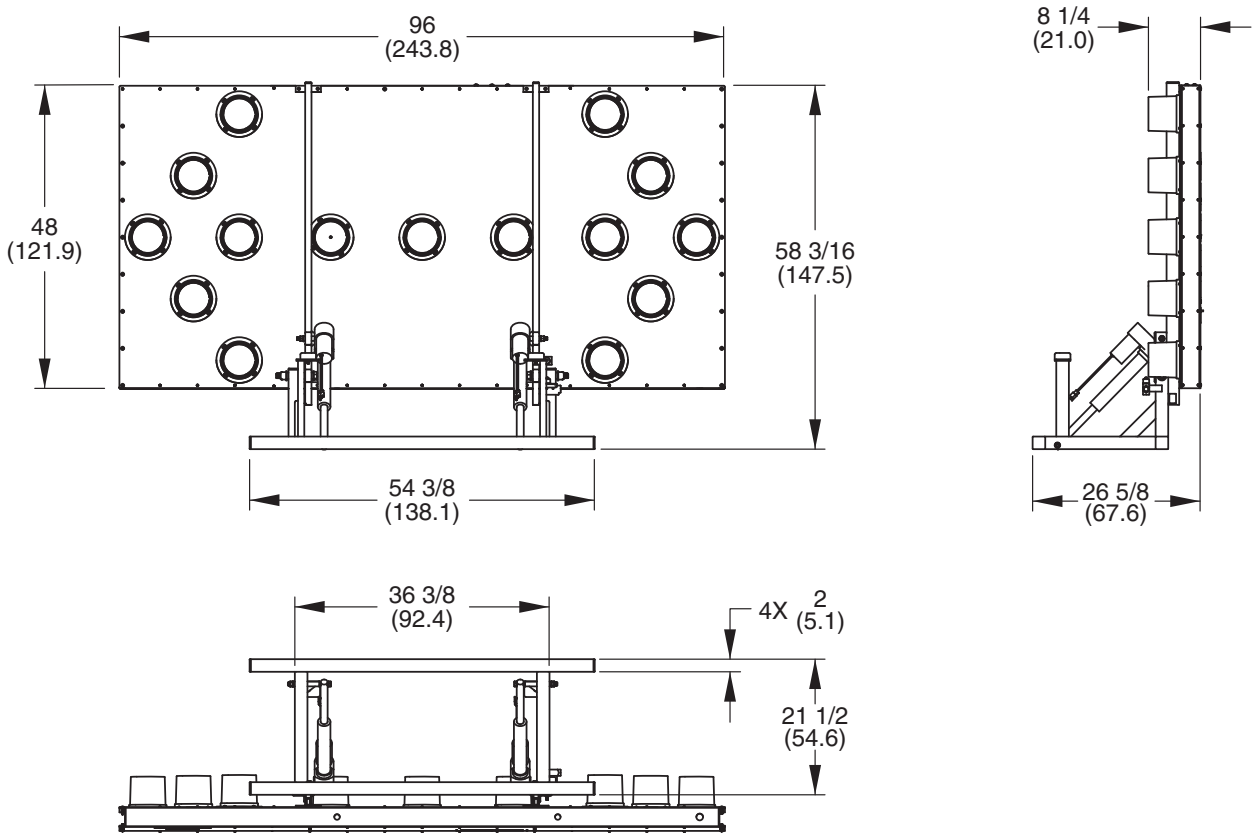


Arrow board size	A	B	C	D	E	F	G	H	J	Weight, approx. lbs. (kg)
30×60	30 (76.2)	60 (152.4)	37 (94.0)	65 3/8 (166.0)	6 3/16 (15.8)	22 (55.9)	21 7/8 (55.4)	1 15/16 (4.9)	51 3/16 (130.0)	182 (83)
36×72	36 (91.4)	72 (182.8)	40 (101.6)	77 3/8 (196.4)	8 1/4 (21.0)	21 7/8 (55.6)	21 3/4 (55.2)	1 13/16 (4.6)	63 3/16 (160.5)	210 (95)

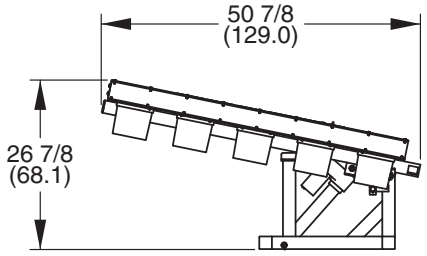
Figure A-6. Arrow board with low-profile trailer-mount frame

Dimensions in inches (cm)

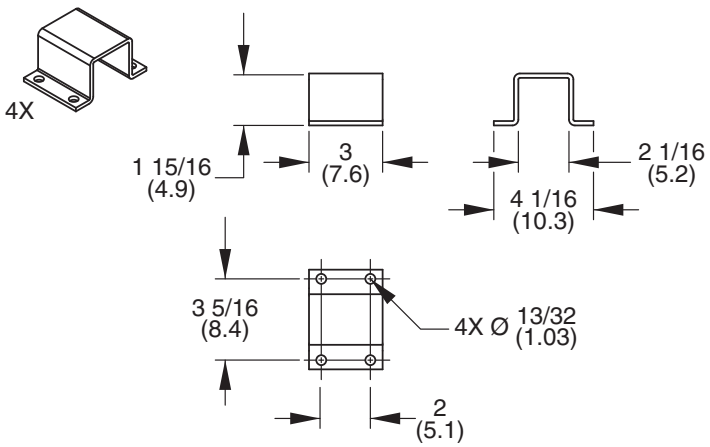
Deployed



Travel position



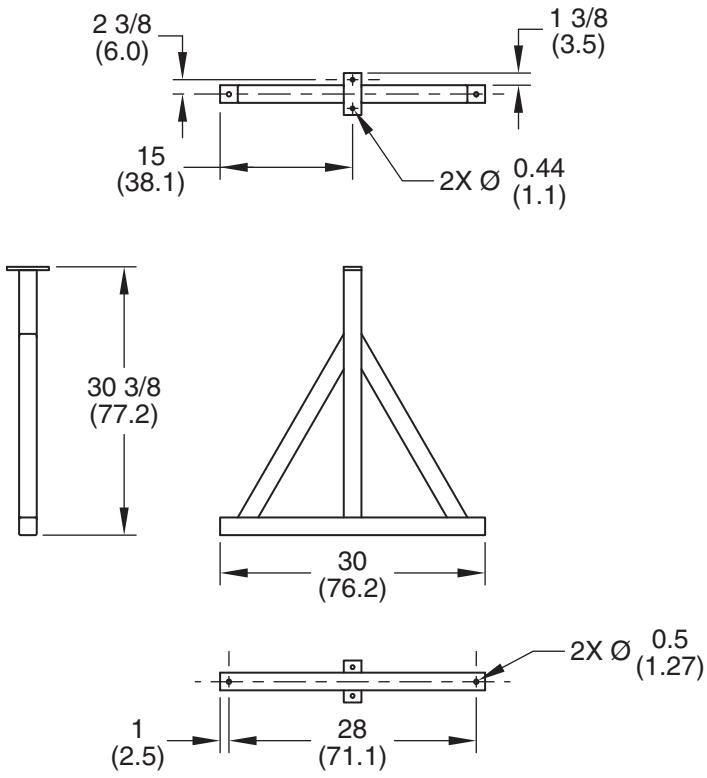
Mounting brackets



A.2 Truck-bed brackets

Figure A-7. Truck-bed brackets

Dimensions in inches (cm)



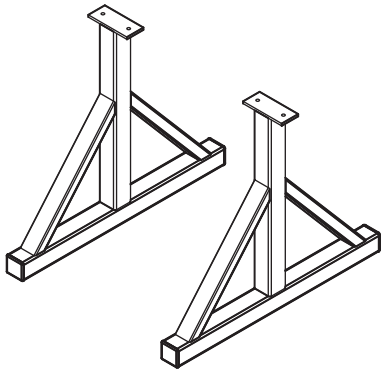
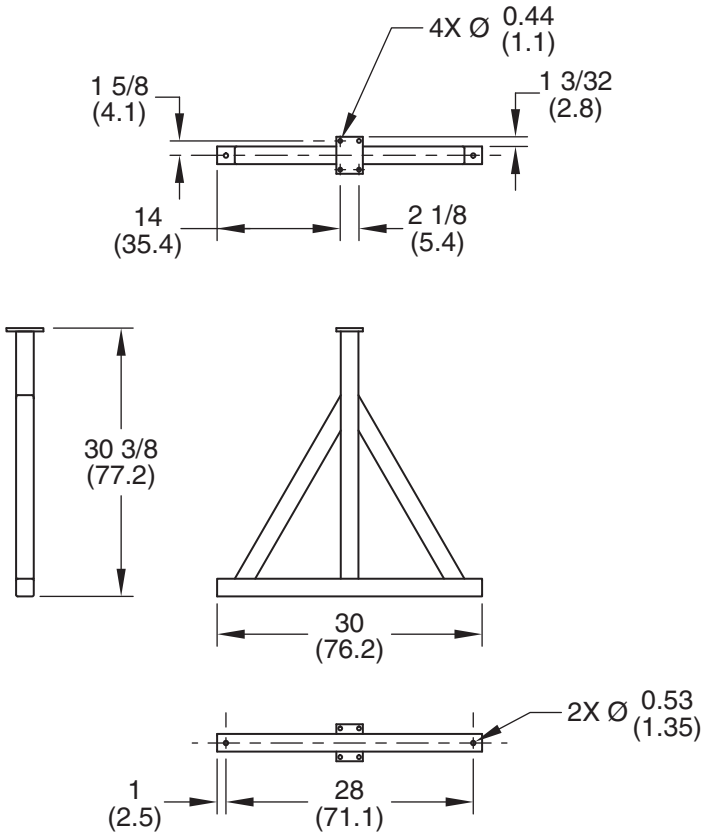
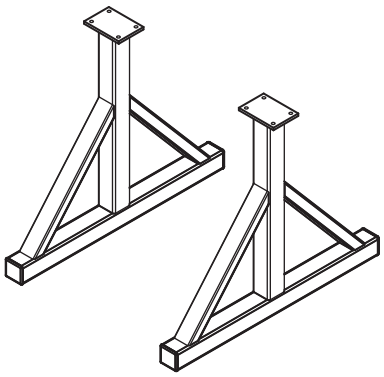


Figure A-8. Truck-bed brackets for 48×96 size arrow boards

Dimensions in inches (cm)





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