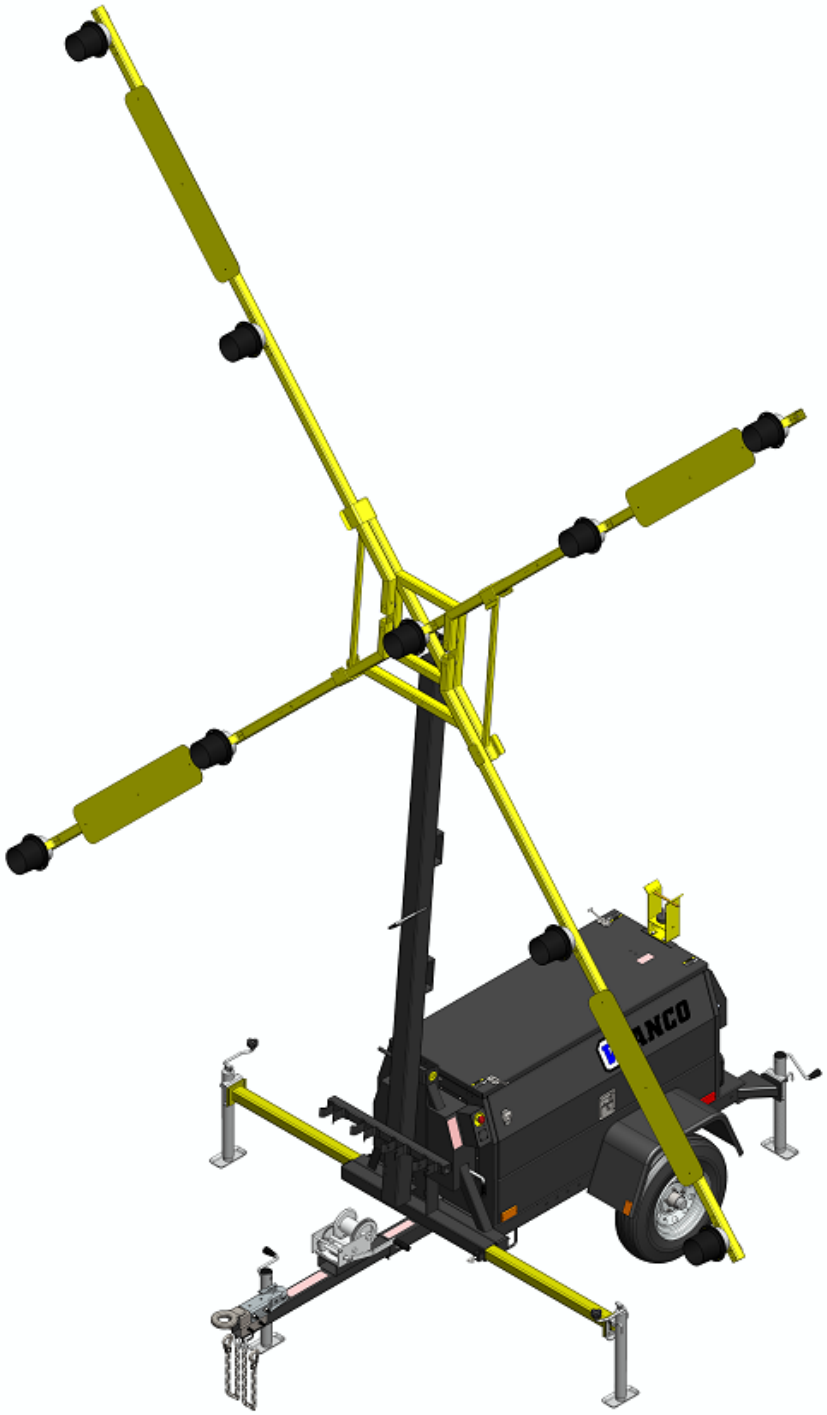
X-Marker™ L-893(L) Runway Closure Marker



User's Manual

November 2018

WANCO® The industry leader.

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1 Introduction

1.1 Read before using

This is the owner's manual for Wanco Runway Closure Trailer. 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 are representative of all Runway Closure Trailer models, but might differ in detail from your unit.

Keep this manual or a copy of it with the unit. Additional and replacement manuals are available from the factory (see Section 1.4, page 2).

If you have questions regarding this product, please contact Wanco Customer Service using the information in Section 1.4.

1.2 Runway Closure Trailer models

All standard Runway Closure Trailer models are covered by this manual. All models are operationally similar. Functional differences between models are:

- Optional, auxiliary equipment

1.3 Applications

The Wanco Runway Closure Trailer can be used in any application where a device is need to indicate a closed airport runway.

The LED lights and enclosed cabinet on the Runway Closure Trailer allow for operation in inclement weather. The design consumes little fuel allowing for extended runtimes

1.4 Where to obtain service

Before calling for service, please have the unit's model number and VIN ready. This information is displayed on the vehicle identification tag (see Figure 1-1).

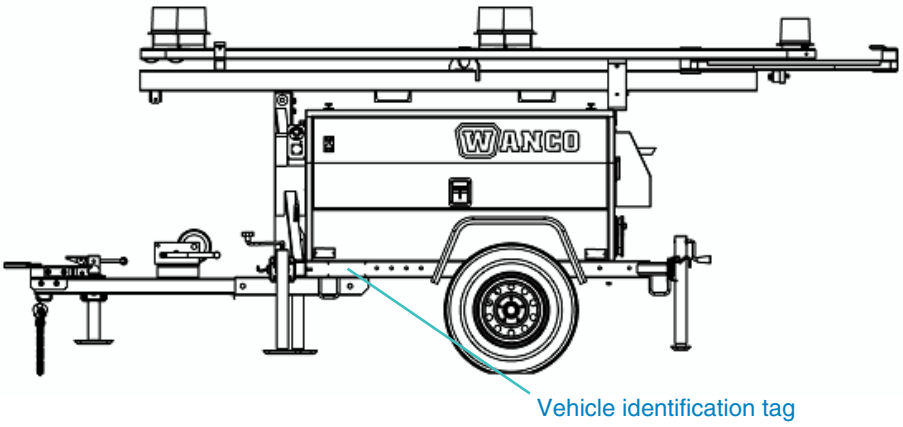
Contact our customer service department using the following information:

Wanco Inc.
5870 Tennyson Street
Arvada, Colorado 80003

303-427-5700
fax 303-427-5725

www.wanco.com
info@wanco.com

Figure 1-1. Vehicle identification tag location



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 and the engine manual.

⚠ CAUTION

Crush hazard.

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

Your trailer is a complex piece of machinery. You must have a reasonable level of familiarity with the trailer in order to use it safely. Using the trailer without proper understanding is potentially dangerous to you and to others in the area of the runway closure trailer.

Do not transport, operate, or service the trailer before reading and understanding all the information provided in this document and the engine manual, which is available for download from the engine manufacturer's website.

If you have questions, and for additional information, contact Wanco customer service (see Section 1.4, "Where to obtain service," page 2).

2.3 Operating safety

2.3.1 Prior to use

⚠ DANGER

Electric shock hazard.

Contact with overhead electrical power lines will cause serious injury or death.

Do not position the trailer under power lines.

⚠ WARNING

Falling equipment will cause serious injury or death.

Before using the trailer, level unit and extend outriggers.

- The trailer mast is extended to 20.5 feet (6.25 meters) in height. Ensure the area above the trailer is clear of obstructions.
- To reduce the risk of shifting, rolling, or overturning, locate the trailer on a firm, level surface, with enough space to deploy the trailer's outriggers.
- For increased stability, always extend the outriggers before raising the trailer mast.
- To reduce the risk of personal injury, ensure the surrounding area is in good order and free of debris.
- Do not allow water to accumulate around the base of the trailer.
- Ensure the trailer is in good operating condition. Never use any equipment that is damaged or in need of repair.

2.3.2 During operation

⚠ DANGER

Falling equipment will cause serious injury or death.

- When raising or lowering the trailer mast, ensure the areas behind and in front of the trailer are clear of people.
- Never change the mast position from vertical to horizontial when the light arms are not properly secured.
- Ensure the vertical-lock pin is properly engaged when the trailer is in use.
- If the mast "hangs up" or the winch cable develops slack while raising or lowering the mast, stop immediately, move away from the trailer, and contact a Wanco service representative.

- Ensure the trailer is well grounded, per all applicable regulations.
- Never raise, lower, or move the trailer while the unit is in use.
- Do not collapse the outriggers or move the trailer while the mast is vertical.
- When not in use, or in case of high winds, lower the trailer mast to the transport position (see Section 4.5.4, page 25).

IMPORTANT!

Your trailer may include a fluid containment system (see Section 4.3, page 16).

To avoid accumulation of rain, snow, or other moisture in the containment pan, do not operate the trailer with the equipment cabinet doors or maintenance panel open.

Before leaving the trailer running, ensure both gull-wing doors and the top panel are closed and properly latched.

2.4 Engine safety

2.4.1 Operator safety

⚠ DANGER

Explosion hazard.

- Keep engine, fuel, and other combustibles away from sparks, open flame, and burning objects.
- Do not smoke near engine.
- Stop engine before filling or draining fuel tank.
- Use only diesel fuel.
- Replace fuel tank cap after refueling.
- Do not use gasoline, other fuels, or flammable solvents to clean parts.

⚠ DANGER

Asphyxiation hazard.

- Operate the engine outdoors and keep away from engine exhaust.
- If operating in an enclosed area, vent exhaust fumes to outdoors and maintain adequate ventilation.
- Refill and drain fuel tank only in a well ventilated area.
- Perform maintenance in a well ventilated area.

⚠ WARNING

Fire hazard.

A hot muffler can ignite flammable materials.

Keep area around muffler free of debris such as leaves, paper, and cartons.

⚠ CAUTION

Risk of severe burn.

- Do not touch the engine, exhaust pipes, or areas near the exhaust at rear of trailer.
- Do not remove radiator cap when engine is hot. Contents are hot and under pressure.

2.4.2 California Proposition 65

⚠ WARNING

Health hazard.

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

2.4.3 Spark arresters

IMPORTANT!

State and local safety codes specify that, in certain locations, internal combustion engines that use hydrocarbon fuels must be used with spark arresters.

A spark arrester is a device constructed of nonflammable materials specifically for the purpose of removing and retaining carbon and other flammable particles from the exhaust flow of an internal combustion engine.

Spark arresters are qualified and rated by the United States Forest Service. To comply with all applicable laws regarding spark arresters, consult your local Health and Safety Administrator.

2.5 Service safety

2.5.1 Before servicing

⚠ DANGER

High voltage.

Contact with live electrical circuits will result in serious injury or death.

- Before servicing any component on the trailer, turn off power, then disconnect cables from battery.
- Only a qualified electrician should service the units electrical system.

⚠ CAUTION

Adverse weather conditions can cause equipment damage and injury.

Whenever possible, perform maintenance indoors.

- The engine is permanently grounded to the trailer. NEVER perform even routine service (such as changing oil and filters, or cleaning the engine) unless all electrical components are shut down:
  - ☐ Ensure all power sources are shut off.
  - ☐ Turn the engine key to OFF position and remove the key.
  - ☐ Disconnect battery cables: first from the positive (+) battery terminal,* then from the negative (–) terminal.
- If the ground under or around the trailer is damp or wet, move the trailer to a dry location and allow it to dry before servicing. Do not allow water to accumulate around the base of the trailer.
- Do not service the trailer 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.
- Keep the unit and all its components clean.

2.5.2 During servicing

⚠ WARNING

Moving parts can crush and cut.

- Keep hands, feet, hair, and loose clothing away from moving parts on engine and generator.
- Shut down engine before servicing.

⚠ WARNING

Rotating fan blades can cut.

- Keep hands, feet, hair, and loose clothing away from moving fan blades.
- Do not operate engine with fan guard removed.

- To prevent injury, keep hands, feet, hair, and loose clothing away from all moving parts.
- For reliable performance, keep the trailer and all its components clean.

**Removing the positive cable first is a requirement for negative-ground systems.*

2.6 Labels

Labels provide instructions and information. They also warn of hazards. For convenience and safety, keep all labels in legible condition, replacing labels when damaged or missing. Replacement labels are available from the factory.

- Labels on the exterior of the trailer:
  - Figure 2-1 indicates label locations
  - Table 2-1 provides sample labels
- Labels on the interior of the equipment cabinet:
  - Figure 2-2 indicates label locations
  - Table 2-2 provides sample labels

Figure 2-1. Exterior label locations

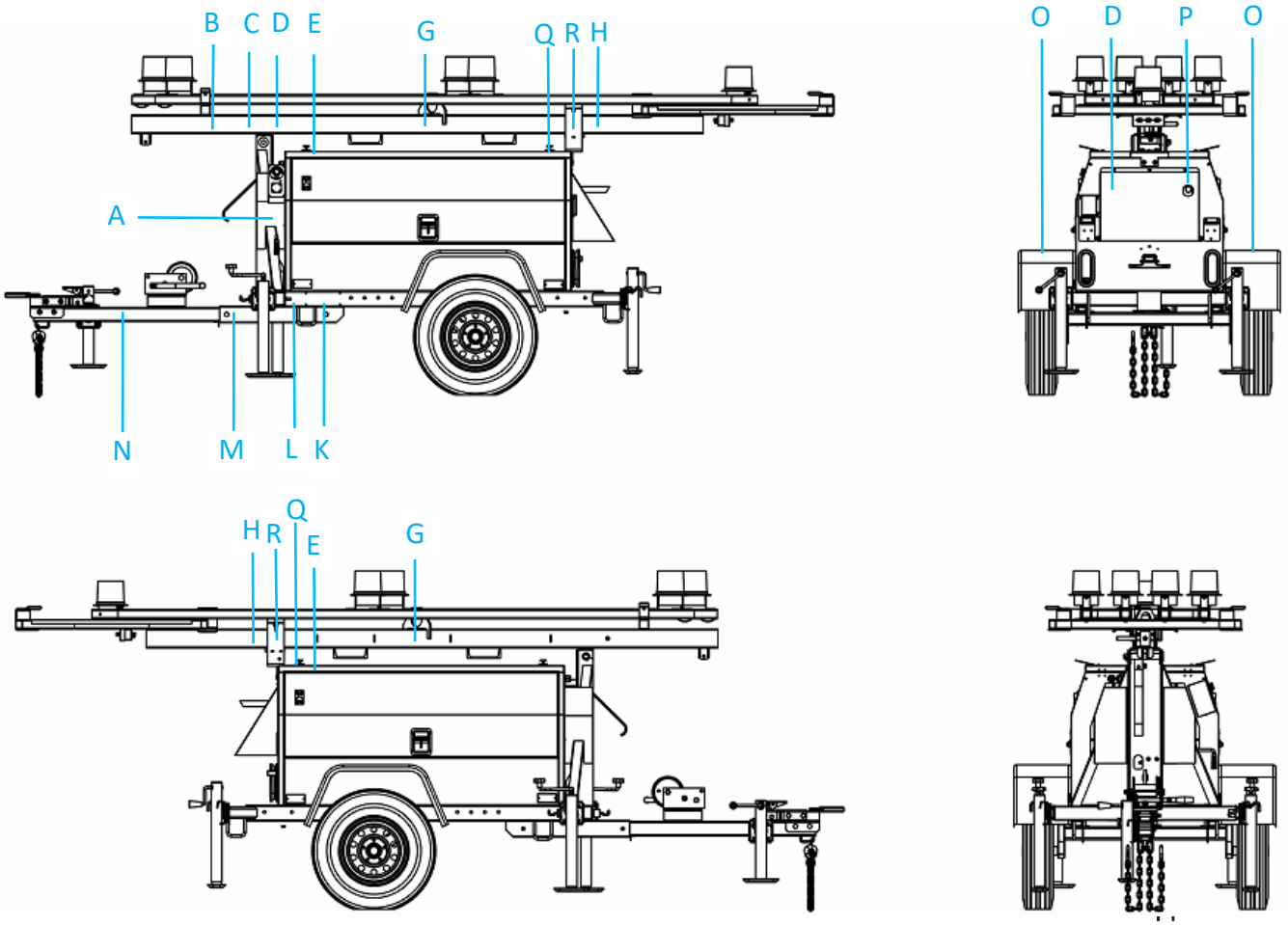
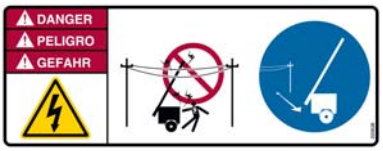
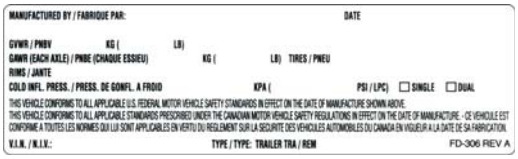
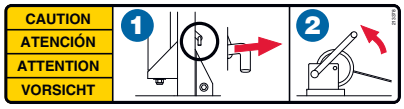
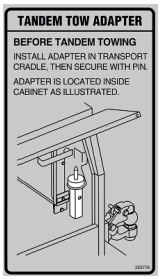


Table 2-1. Exterior label samples and descriptions

Ref.*	Label	Description
A		Danger: falling equipment
B		Danger: shock hazard
C		Warning: crush hazard
D		Danger: falling equipment
E		Caution: panel damage
G		Lifting point
H		Warning: secure transport lock

*Reference Figure 2-1 for label location.

Table 2-1. Exterior label samples and descriptions (Continued)

Ref.*	Label	Description
I		Caution: panel damage
K		Vehicle identification tag
L		Electrical ground
M		Caution: equipment damage¨¨
N		Warning: towing requirements
O		Tire pressure
P		Warning: hot surface
Q		Tandem Tow adapter Location
R		Caution: Secure with Pin

*Reference Figure 2-1 for label location.

Table 2-1. Exterior label samples and description (Continued)

Ref.*	Label	Description
S		Tandem Tow Adapter Front - Right Side
T		Tandem Tow Adapter Front - Left side

*Reference Figure 2-1 for label location.

Figure 2-2. Interior label locations

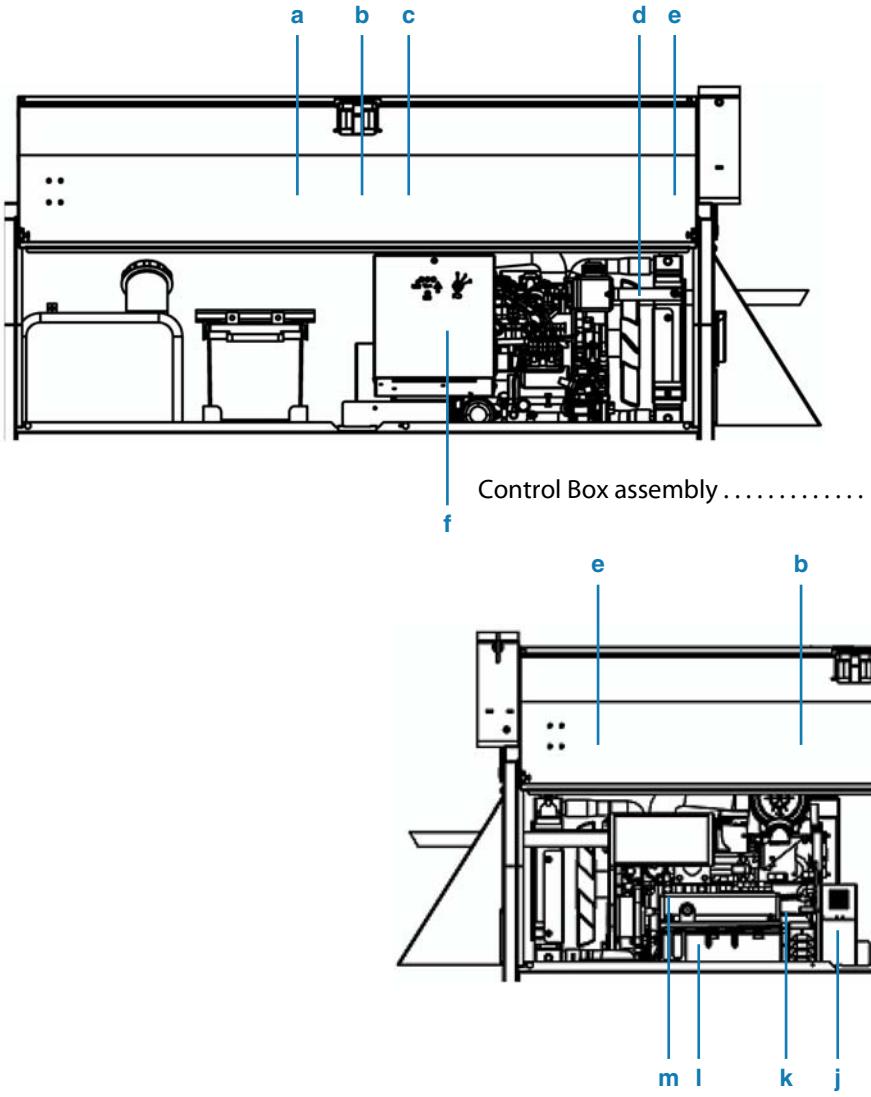
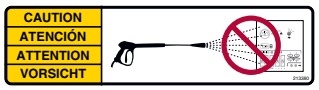
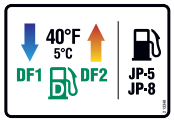


Table 2-2. Interior label samples and descriptions

Ref.*	Label	Description
a		Danger: explosion and fire hazards
b		Risk of fluid spill (Included with optional containment)
c		Caution: equipment damage
d		Do not fill coolant overflow bottle
e		Warning: rotating fan blades
f		Warning: verify operation
g		Fuel type
h		Warning: California Prop. 65
i		Diesel fuel
j		Warning: rotating machinery
k		Warning: hazardous voltage

*Reference Figure 2-2 for label location.

Table 2-2. Interior label samples and descriptions (Continued)

Ref.*	Label	Description
l		Generator identification tag
m		Neutral bonded to frame

*Reference Figure 2-2 for label location.

3 Tow hitch

3.1 Reversing the tow hitch

The standard tow bar includes a combo hitch for a 2-inch ball and 3-inch pintle hook.

When the trailer ships from the factory, the tow bar is set up to use the lunette ring for towing by a vehicle with a pintle hook. To use a ball coupler, follow the procedure below.

To reverse the tow hitch:

1. Remove the two large bolts that hold the tow hitch to the draw bar.
2. Lift the hitch off the drawbar and rotate the hitch end-to-end.
3. Return the hitch to the drawbar, making sure to align the bolt holes.
4. Reinstall the bolts and tighten the nuts fully.

4 Operation

4.1 Read before using

⚠ WARNING

Improper use of equipment could cause serious injury or death.

Before using this product:

- Carefully read, understand, and observe all instructions in this manual and the engine manual.
- Read and follow all safety instructions (see Section 2, page 3).

IMPORTANT!
During the regular visual verification, due to happen every two hours, every light head must be inspected to verify operation of all LEDs within the light head. Any found to have inoperable LEDs should be promptly replaced.

4.2 Overview

A typical deployment of the Wanco Runway Closure Trailer includes the following steps:

1. Moving the trailer to its destination (Section 4.4, page 17)
2. Deploying the light arms:
   a. Locating and positioning the trailer (Section 4.5.1, page 21)
   b. Leveling the trailer (Section 4.5.2, page 21)
   c. Deploying the lights and raising the mast (Section 4.5.3, page 22)
3. Operating the Trailer (Section 4.6, page 26)

4.3 Fluid containment system (optional)

The trailer might be equipped with an integral fluid-containment system that captures up to 110% of all system fluids in the event of leaks, drips, and spills. The containment pan is located at the bottom of the equipment cabinet.

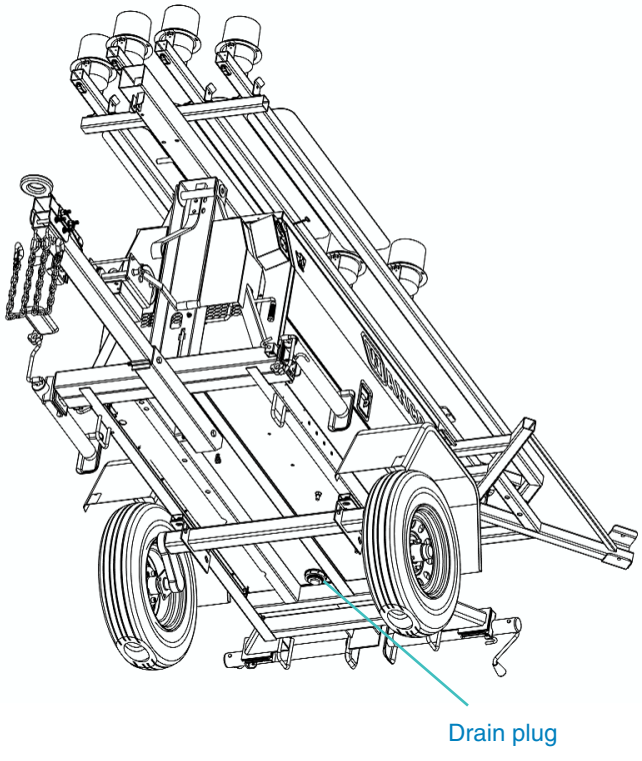
IMPORTANT!

To avoid accumulation of rain, snow, or other moisture in the containment pan, do not operate the trailer with the equipment cabinet doors or maintenance panel open.

Before leaving the trailer running, ensure both gull-wing doors and the top panel are closed and properly latched.

Before using the trailer, ensure the containment pan is empty. To drain the pan, open the drain plug, which is located under and near the back of the trailer (see Figure 4-1).

Figure 4-1. Containment-pan drain plug



4.4 Towing, forking, and hoisting

4.4.1 Before towing

Before towing, prepare the trailer as follows.

1. Follow the safety requirements in Section 2, page 3.
2. Prepare the trailer for transport:
   a. Lower and secure the trailer mast. (For instructions, see Section 4.5.4, page 25.)
   b. Verify the mast is in the down position and secured in place at the transport cradle with the horizontal-lock pin (see Figure 4-2).
   c. Verify the maintenance panel is all the way down and secured in place with the two draw-latches inside the equipment cabinet (see Figure 4-3).
   d. Stow each light arm assembly and secure in place with the locking pins (see Figure 4-8).

> **⚠ WARNING**
> **Loose equipment will damage unit and could result in serious injury or death.**
>
> Before moving the trailer from one location to another, ensure the light arms are stowed and secured in their respective cradles.

   e. Close and latch the gull-wing side doors if previously opened.
   f. If necessary, attach a red flag to the end of the mast at the back of the trailer.

Figure 4-2. Horizontal-lock pi

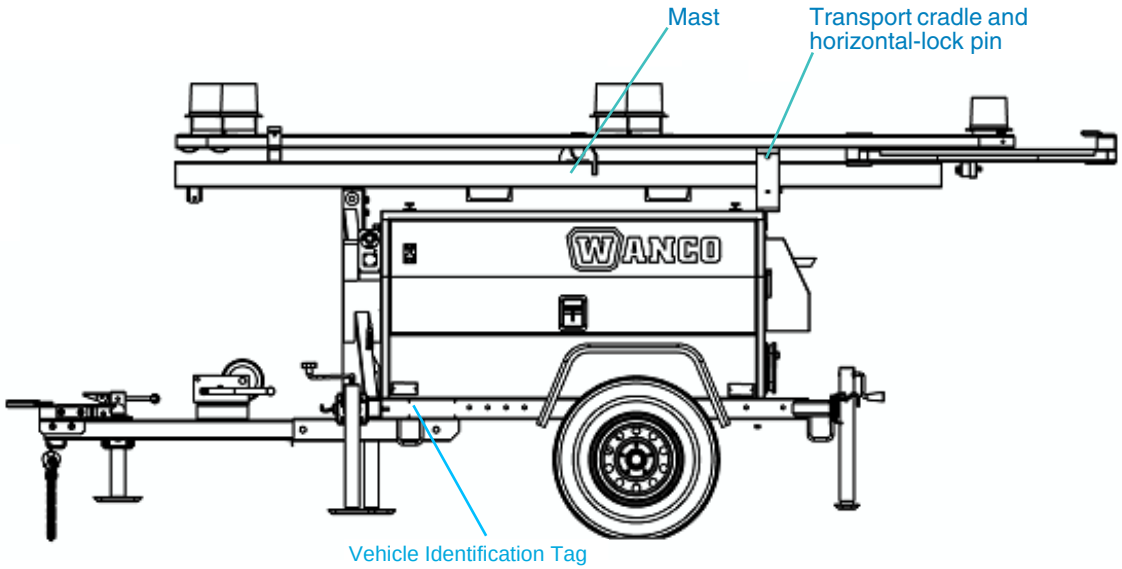
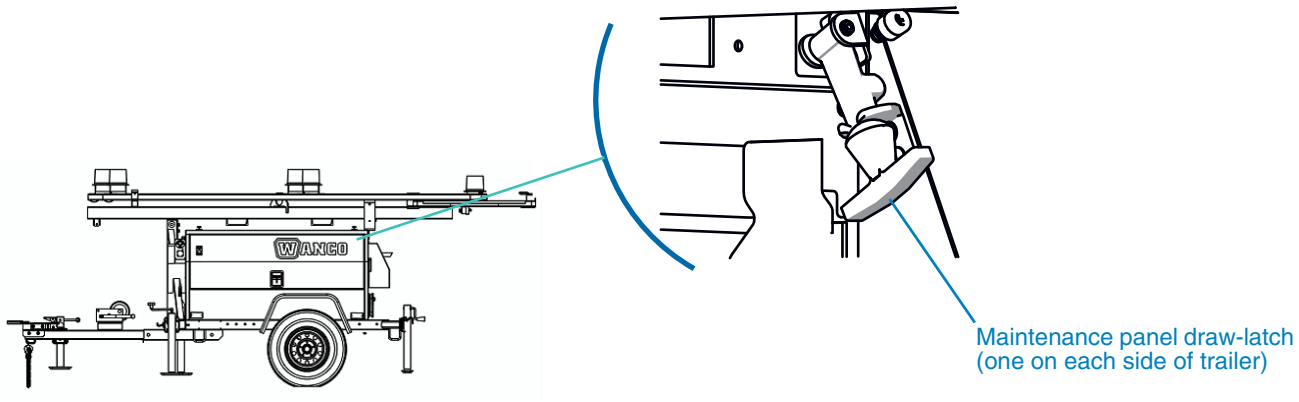
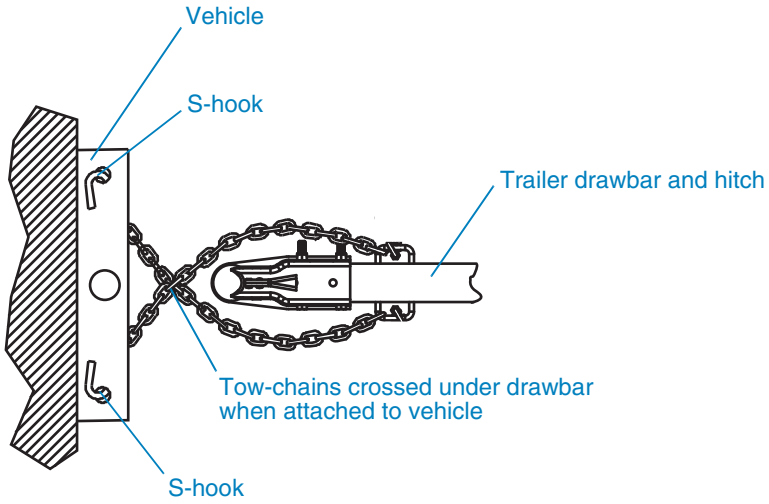


Figure 4-3. Maintenance panel draw-latches



3. Check the tow hitch and safety chains:
   a. Ensure the tow hitch and coupling on the tow vehicle are rated for weight equal to or greater than the trailer's gross vehicle weight rating (GVWR). The GVWR is displayed on the runway closure tower vehicle identification tag (see Figure 4-2).
   b. Ensure the tow hitch on the trailer and the tow vehicle are compatible.
   c. Inspect the tow hitch and coupling for wear and damage. Replace or repair if necessary.
   d. Verify the rear and side leveling jacks are in the up position, the outriggers are contracted, and all are secured with their locking pins:
      - To raise jacks, turn the jack handle until the jack foot is off the ground, then pull the jack locking pin and rotate the jack upward until its locking pin snaps into position with an audible "click."
      - To contract outriggers, pull the outrigger locking pin (not the jack locking pin) and push the outrigger in, toward the trailer, until its locking pin snaps into position with an audible "click."
   e. Use the drawbar jack to raise the front of the trailer and set the drawbar hitch on the tow vehicle hitch. Ensure the coupling is properly engaged and locked.
   f. Raise, rotate, and lock the front jack in the up position.
   g. Verify approved safety chains are attached properly to both the trailer and tow vehicle, as illustrated in Figure 4-4.

Figure 4-4. Tow-chain hook-up



4. Check tires and wheels:
    a. Check tires for wear. Replace worn tires.
    b. Verify tires are fully inflated to the proper pressure.
    c. Verify that all wheel lugs are in place and tightened. Do not tow the trailer if a wheel lug is missing.
    d. Remove blocks or chocks from wheels, if present.
5. Ensure the trailer brake lights, taillights, and directional (turn) indicators are hooked up and functioning properly.
6. Follow the towing requirements in Section 4.4.2.

4.4.2 During towing

- Do not tow the trailer with any people, parts, supplies, or additional equipment attached to it or loaded onto it.
- Do not tow additional trailers or other equipment in tandem with the trailer.
- The recommended maximum speed for highway towing is 65 mph (105 km/h). For off-road towing, the recommended maximum speed is 15 mph (25 km/h) or less, depending on terrain.
- Adhere to applicable transportation department regulations when towing the trailer.

4.4.3 After towing

After towing, unhook the tow chains from the tow vehicle, then use the drawbar-mounted jack to raise the drawbar and release the drawbar hitch from the tow vehicle. Pull the vehicle away from the trailer when ready.

4.4.4 Tandem Towing (Optional)

The trailer might be equipped for Tandem Towing

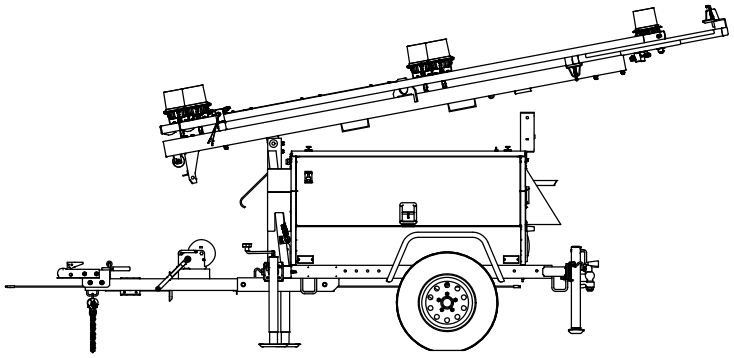
To Tandem Tow

1. Raise the mast using the hand winch so its is free from the cradle (Figure 4.5_1)
2. Locate Tandem Tow Adapter in Cabinet (Figure 4.5_2)
3. Install Tow Adapter in Cradle, making sure it is facing the correct way (Figure 4.5_3)
4. Secure Tow Adapter with Horizontal Mast Lock Pin (Figure 4.5_4)
5. Lower Tower using the hand winch so it rests on the tow adapter (figure 4.5_5)
6. Repeat Steps 1, 3, 4, and 5 for the remaining trailer.
7. Hitch the trailers together, Refer to section 4.4.1 (Figure 4.5_6)

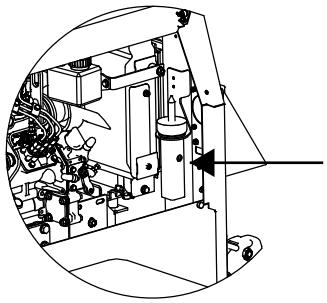
CAUTION

Do not exceed 25mph when tandem towing. Tandem towing is only to be used on Airport Grounds during deployment. Do not tandem tow this unit on highways or public streets.

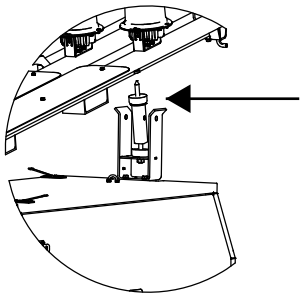
Figure 4.5. Tandem Towing



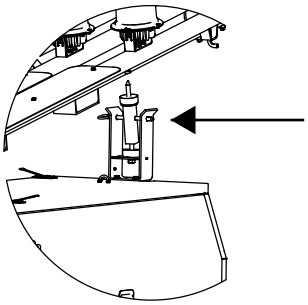
1 - Raise Tower



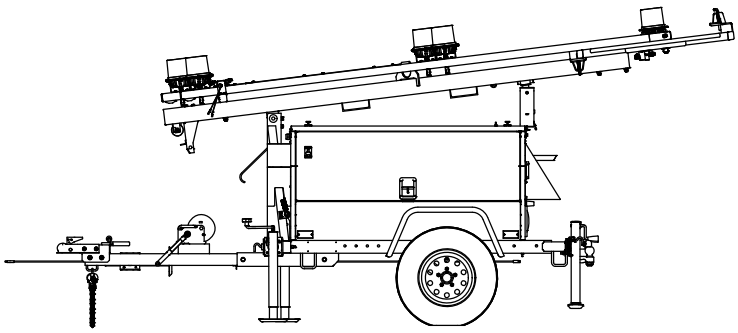
2 - Tandem Tow Adapter



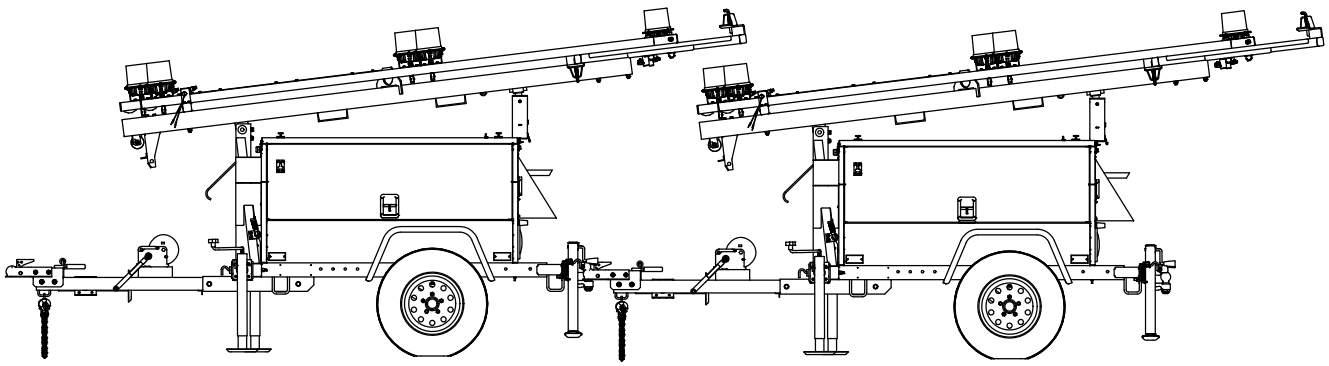
3 - Install Tandem Tow Adapter



4 - Secure Tandem Tow Adapter with Pin



5 - Lower Tower



6 - Tandem Towing Arrangement

Caution: Do not exceed 25mph or tow on Highways

4.4.5 Forking and hoisting

The trailer can be transported using a forklift or hoisted by means of the hoist ring on the mast.

Before using a forklift or hoist to move the trailer:

- Ensure the mast is in the horizontal (transport) position, fully nested in the transport cradle, and secured in place with the attached horizontal-lock pin (see Figure 4-5).
- Ensure both gull-wing doors and the top panel are closed and properly latched.
- Ensure devices such as slings, chains, hooks, ramps, and jacks are secure and will bear the weight of the trailer. The trailer's gross vehicle weight rating (GVWR) is displayed on the runway closure tower vehicle identification tag (see Figure 4-5).
- Be aware and cautious of people's proximity to the trailer. Always ensure the safety of nearby people.
- For trailers with optional underbody forklift pockets, see Figure 4-6 for dimensions.

Figure 4-6. Forklift pockets and hoisting ring

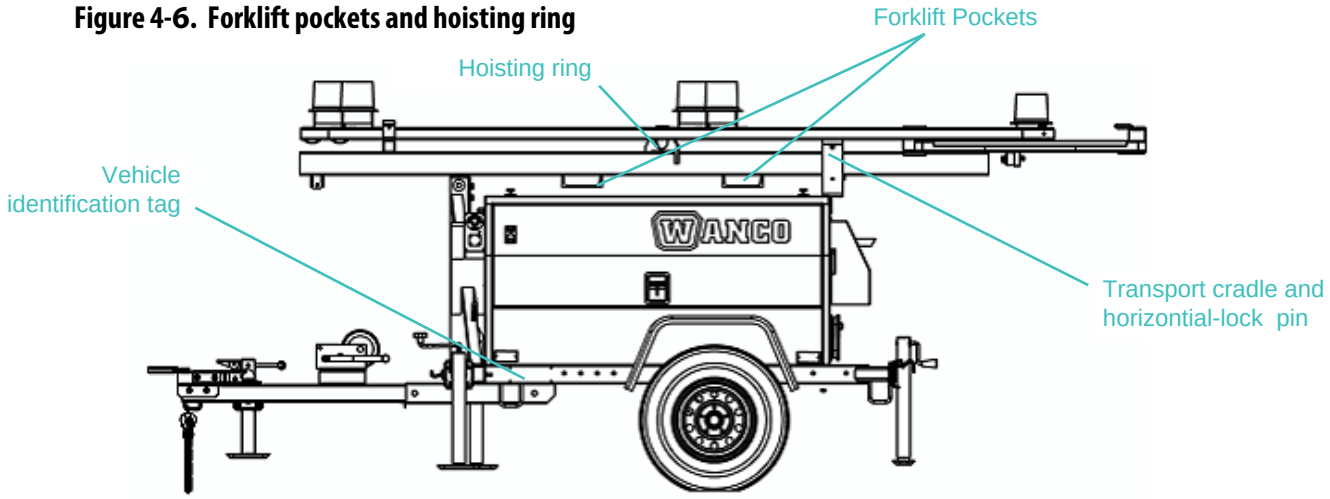
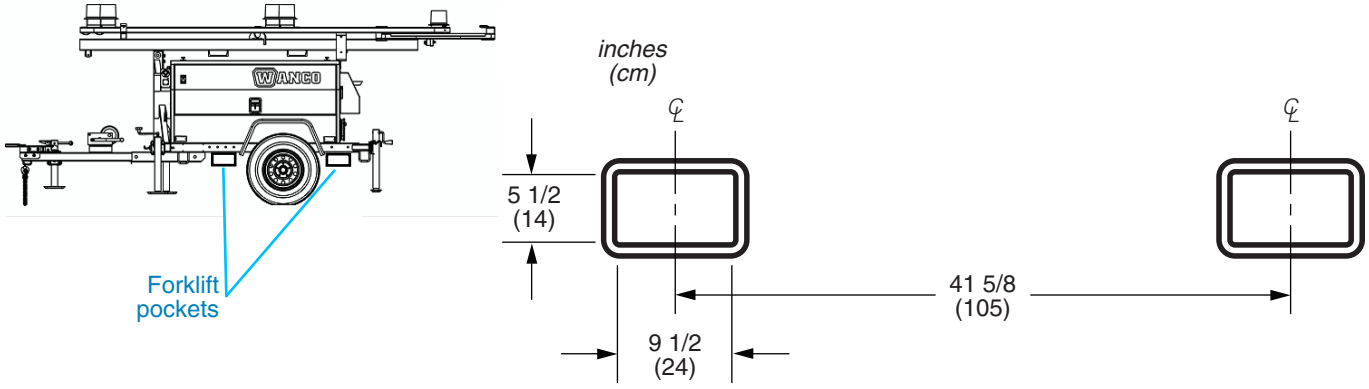


Figure 4-7. Optional underbody forklift pockets



4.5 Deploying the Trailer

4.5.1 Locating the trailer

⚠ DANGER

Electric shock hazard.

Contact with overhead electrical power lines will cause serious injury or death.

Do not position trailer under power lines.

- When deployed, the trailer mast can rise to a height of 20.5 feet (6.25 meters). When choosing a location, ensure the area above the trailer is clear of overhead wires and other obstructions.
- To achieve the best possible visability, locate the trailer in the center of the runway, ensure the trailer is visable from the runway glide path.
- To reduce the risk of personal injury, ensure the surrounding area is in good order and free of debris.
- To reduce the risk of shifting, rolling, or overturning, locate the trailer on a firm, level surface, with enough space to deploy the trailer's outriggers.
- Ensure convenient access to earth ground.

4.5.2 Leveling the trailer

⚠ WARNING

Falling equipment could cause serious injury or death.

- Before deploying the lights, level the trailer and extend its outriggers.
- For safe operation, outriggers must remain extended while the trailer mast is deployed.

Prior to raising and extending the trailer mast, the unit must be level and the outriggers extended for increased stability.

To level the trailer:

1. Block or chock the trailer wheels.
2. Locate the outrigger on either side of the trailer. Pull the outrigger locking pin (not the jack locking pin) and pull the outrigger outward, away from the trailer, as far as it will go. When fully extended, the locking pin snaps into position with an audible "click."
3. Pull the jack locking pin and rotate the jack downward until the locking pin engages. Do not lower the jack foot yet.

4. Repeat the previous two steps for the other outrigger, then locate and rotate the two jacks at the rear corners of the trailer.
5. Determine which corner of the trailer is highest, and extend the jack foot on that corner downward until it rests firmly on the ground. Then level the trailer with the remaining three corner jacks.
6. Lower the drawbar jack if desired for added stability.

4.5.3 Raising the Mast

⚠ DANGER

Electric shock hazard.

Contact with overhead electrical power lines will cause serious injury or death.

Do not raise the mast when it is near or under overhead power lines.

⚠ DANGER

Falling equipment will cause serious injury or death.

- If the mast "hangs up" or the winch cable develops slack while raising the mast, stop immediately, move away from the trailer, and contact a Wanco service representative (see Section 1.4, "Where to obtain service," page 2).

CAUTION

⚠

Crush hazard.

When tilting the mast from horizontal to vertical, keep hands and body parts clear of mast.

- The trailer mast can be raised to 20.5 feet (6.25 meters) in height. Ensure the area above the trailer is clear of overhead wires and other obstructions.

After locating the trailer (Section 4.5.1) and leveling the trailer (Section 4.5.2), deploy the lights and raise the mast and start the unit by following these steps:

1. Follow all safety requirements in Section 2, page 3.
2. Prepare for deployment by referring to Figure 4-7 and following these steps:
   a. Ensure the trailer wheels are blocked or chocked.
   b. Connect the trailer ground stud to earth ground.
   c. Take the weather into account: do not raise or use the tower in high winds or an electrical storm.
3. Raise the tower by referring to Figure 4-8 and following these steps:
   a. Ensure the areas around and above the trailer are clear from obstructions.
   b. Remove the horizontal mast lock pin from the transport cradle. (Figure 4-8_1)
   c. Remove the arm retaining pins (Figure 4-8_2)
   d. Rotate each arm into position. (Figure 4-8_3)
   e. Arms will automatically lock into place (4x). (Figure 4-8_4)
   f. Ensure people are clear of the areas around the trailer. Stand next to the trailer when raising the mast.
   g. Raise the mast into position using the hand winch. The mast will lock at about 5° from the vertical position. (Figure 4-8_5)
4. Starting the generator and turning on the lights:
   a. Starting the generator (Section 4.6.2)
   b. Flip the Function Switch to Automatic mode (Figure 4-9, page 26)

Figure 4-8. Ground stud, Wheel chocks

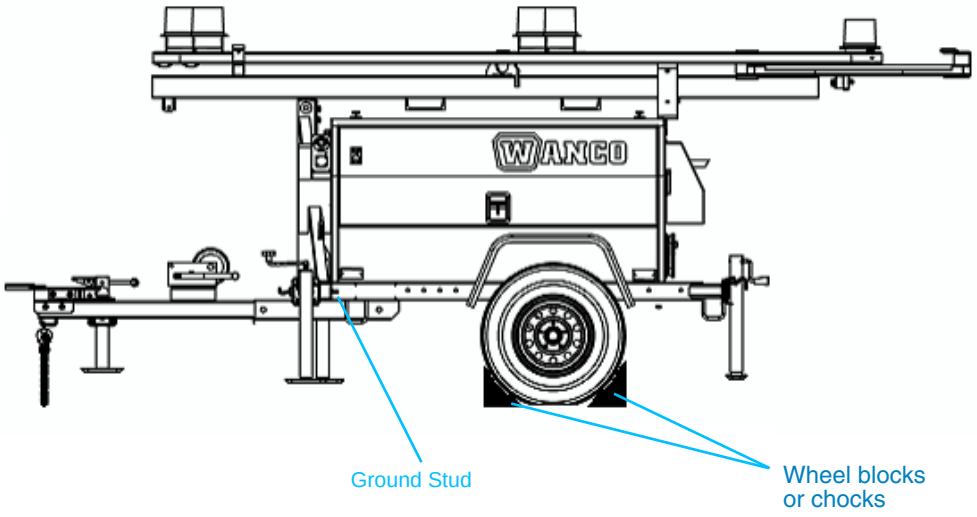
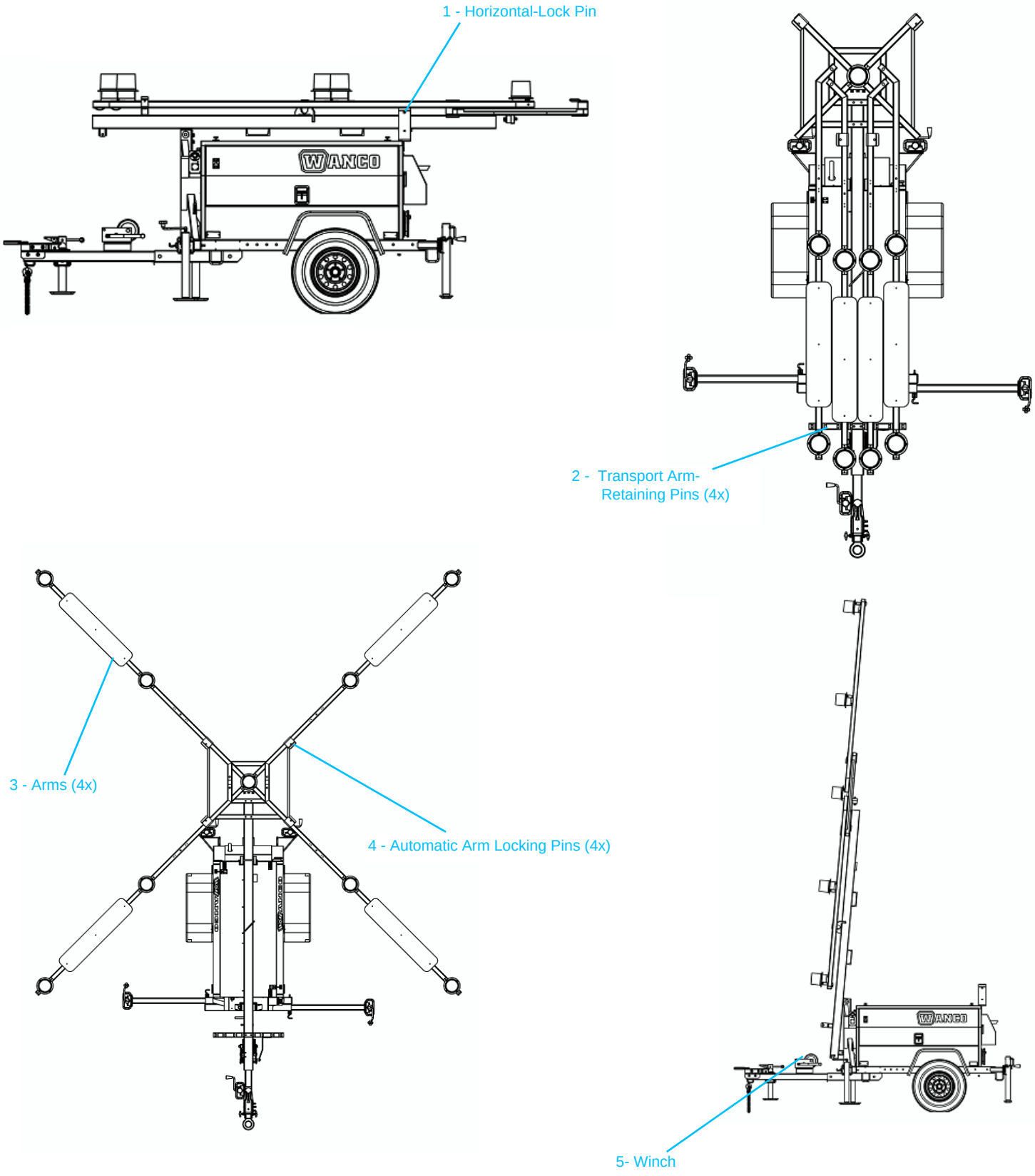


Figure 4-9. Raising the Tower and Deploying Lights



4.5.4 Lowering the tower

⚠ DANGER

Falling equipment will cause serious injury or death.

- If the mast "hangs up" or the winch cable develops slack while lowering the mast, stop immediately, move away from the light tower, and contact a Wanco service representative (see Section 1.4, "Where to obtain service," page 2).

To lower the tower, see Figure 4-8 and use the following instructions.

1. Follow all safety requirements in Section 2, page 3.
2. Turn off lights and engine;
   a. Toggle the function switch to the OFF position. (See Figure 4-9)
   b. Turn off the engine using the key on the control panel. Turn the key to the number 0 position.
3. Lower the tower.

   Ensure people are clear of the areas in front of and behind the runway closure trailer. Stand next to the trailer when lowering the mast.
4. Tilt the mast to the horizontal (transport) position:
   a. Ensure people are clear of the areas in front of and behind the runway closure trailer. Stand next to the trailer when tilting the mast.
   b. Release the spring loaded vertical lock pin by pulling it outward, away from the mast. If the pin resists, ensure the mast is fully deployed by using the drawbar-mounted winch to tighten the cable.

      ⚠ CAUTION

      Operating winch with vertical-lock pin engaged could result in equipment damage and serious injury.

      Mast will not tilt to horizontal with vertical lock pin engaged. First release pin, then operate winch.

   c. While pulling on the pin to release it, use the drawbar-winch to tilt the mast downward. After the mast begins to tilt, release the pin.
      - Rotate the handle of the drawbar winch to loosen the cable and tilt the mast. (Figure 4-8_5)
5. With the mast in the horizontal position, resting in the transport cradle, insert the horizontal mast lock pin and secure it with the attached cotter pin. (Figure 4-8_1)
6. Pull Automatic Arm Locking Pins. (Figure 4-8_4)
7. Rotate the light arms into the travel position. (Figure 4-8_3)
8. Replace the Transport Arm Locking Pins. (Figure 4-8_2)

4.6 Operating the Trailer

4.6.1 Overview

The trailer control panel provides control of the engine, lights and light functions. For details and instructions, see:

- Section 4.6.2, “Manual operation with standard controls,” below
- Section 4.6.5, ”Fuel type,“ page 31
- Section 4.6.6, ”Lights,“ page 31
- Section 4.6.7, ”Optional equipment,“ page 32

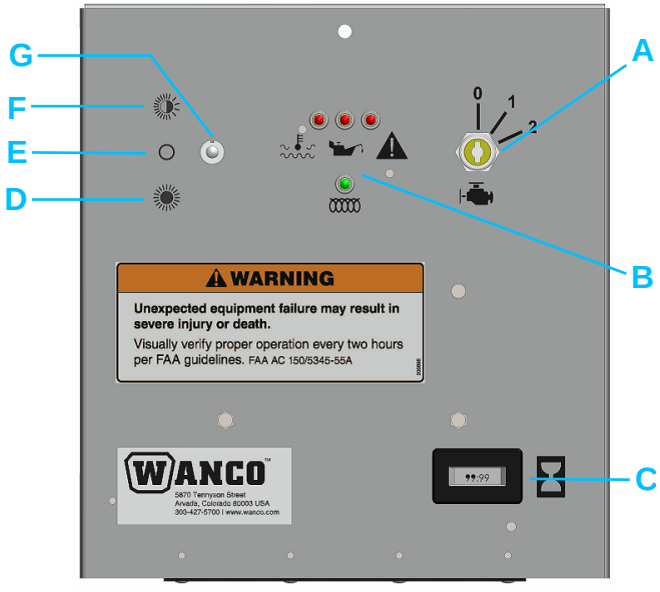
4.6.2 Manual operation with standard controls

Main control panel

For standard trailer models, the main control panel (Figure 4-9) comprises:

- A switch to control light function (Full Bright, OFF, and Automatic Dimming)
- An hour meter to track engine use
- A key switch for starting and stopping the engine and an engine-preheat indicator for the engine’s start coil

Figure 4-10. Main control panel



A – Engine key switch
B – Engine-preheat and status indicators
C – Hour meter
D – Light status - Full Bright (no Dimming)
E – Light status - OFF
F – Light status - Automatic (Auto Dimming)
G - Light Function Switch

VA rating is
436.5
or higher

IMPORTANT!
During the regular visual verification, due to happen every two hours, every light head must be inspected to verify operation of all LEDs within the light head. Any found to have inoperable LEDs should be promptly replaced.

Starting the engine with standard controls

1. Before starting the engine:

   a. Follow all engine safety requirements in Section 2.4, page 6.

   b. Check engine oil, fuel, and coolant levels. Use the proper diesel fuel (see Section 4.6.6, page 31).

   c. If the fuel tank was drained or run dry, it might be necessary to prime the fuel lines. Refer to the engine manual for instructions. (The engine manual is available for download from the engine manufacturer's website.)

   d. Ensure the function switch on the runway closure trailer control panel is in the OFF position.

> **CAUTION**
>
> **Starting the engine under load could damage the runway closure trailer.**
>
> Before starting the engine, ensure function switch is in the OFF position.

   e. If the runway closure trailer is equipped with an emergency stop (E-stop) button, ensure the E-stop button is disengaged by gently pulling the E-stop button outward. The E-stop button is located next to the mast on the outside of the equipment cabinet. The E-stop button is optional equipment and might not be included with your runway closure trailer.

   f. If the runway closure trailer is equipped with an air-intake shutoff valve, ensure the valve is in the open position by checking the T-handle next to the mast on the outside of the equipment cabinet. The valve is open if the T-handle is pushed in toward the equipment cabinet. The air-intake shutoff valve is optional and might not be included with your runway closure trailer.

2. To start the engine:

   a. Insert the engine key into the key slot on the runway closure trailer control panel and turn the key to the number 1 position. The engine-preheat indicator (Figure 4-10, page 28) will light and remain lit for 30 seconds. Do not proceed while this indicator is lit.

   b. When the engine-preheat indicator light goes out, immediately turn and hold the key at the number 2 position until the engine starts. Release the key as soon as the engine starts, or after 10 seconds if the engine does not start.

CAUTION

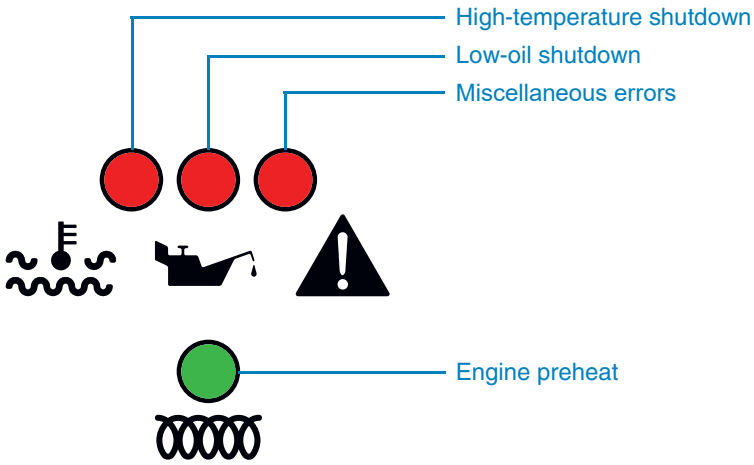
The engine can overheat and damage the start motor.

- Do not hold the engine key at position 2 longer than 10 seconds, regardless of whether the engine starts.
- After 10 seconds, return the key to position 0 and wait 15 to 30 seconds to cool the starter before attempting to start the engine again.

3. After starting the engine, or attempting to start it:

   - If the engine does not start, return the key to position 0 before trying to start the engine again. If the engine key is left in position 1 and the engine is not started, all indicator lights (Figure 4-10) will blink continuously until the key is turned to position 0.
   - If the engine does not gain sufficient oil pressure within 30 seconds of starting, the automatic shutdown system will engage (see Section 4.6.5, page 30). Before attempting to restart the engine, return the key to position 0 to reset the internal 30-second timer.
   - Allow the engine to warm up before engaging power to the lights.
   - Before leaving the runway closure trailer running, ensure both gull-wing doors and the top panel are closed and properly latched.

Figure 4-11. Indicator lights on main control panel



Stopping the engine with standard controls

To manually stop the engine:

1. Toggle function switch to OFF, which shuts down power to the lights.
2. Turn the engine key to the number 0 position.

4.6.3 Emergency engine shutdown

Emergency stop button

If the trailer is equipped with an optional emergency stop button (see Section 4.6.7, page 32), press the button to stop the engine. The button is located next to the mast on the outside of the equipment cabinet.

- Pressing the emergency stop button shuts down power to the engine fuel solenoid, which stops the engine.
- If the emergency stop button is depressed, the engine will not start. Before starting the engine after the emergency stop button has been pressed, first pull the button out.

Air-intake shutoff valve

If the trailer is equipped with an optional air-intake shutoff valve (see Section 4.6.7, page 32), pull the air-shutoff T-handle to stop the engine. The handle is located next to the mast on the outside of the equipment cabinet.

- Pulling the air-shutoff T-handle out from the equipment cabinet stops air intake by the engine. After a few seconds, when the engine runs out of air, it will shut down.
- When the engine shuts down, the lights will continue to run until the batteries are drained.
- The air-intake shutoff valve should open automatically after the engine stops, helping to ensure the engine will start again when needed. If the valve is closed, the engine will not start. Before starting the engine after the shutoff handle is pulled, ensure the handle is pushed in toward the cabinet to ensure the valve is open.

4.6.4 Automatic engine shutdown

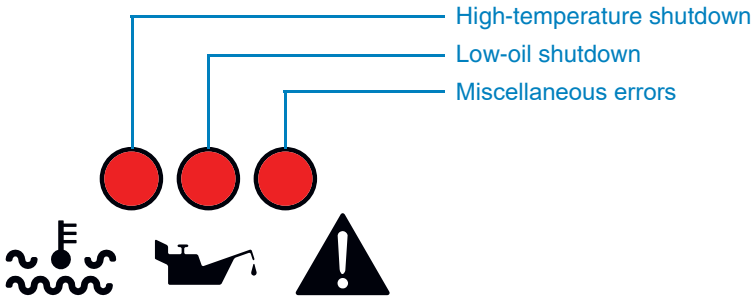
All models

The power system is equipped with an automatic shutdown feature, which prevents damage by shutting down the engine when any of the following conditions occur:

- Oil pressure is too low
- Engine temperature is too high
- Miscellaneous errors

Status indicators on the main control panel (Figure 4-11, page 31) will light displaying the error condition.

Figure 4-12. Shutdown indicators on control panel



4.6.5 Fuel type

Use only diesel fuel for the trailer. The recommended fuel type varies with ambient temperature. Typically:

- When the ambient temperature is 40°F (5°C) or above, use diesel fuel #2 (DF2).
- When the ambient temperature is below 40°F (5°C), use diesel fuel #1 (DF1).
- For very cold climates, use the appropriate winter-blend diesel fuel.
- JP-5 and JP-8 fuels are also acceptable.

For more information about fuel type, read the engine manual. (The engine manual is available for download from the engine manufacturer's website.)

4.6.6 Turning the lights on and off

Allow the engine to warm up before turning on the lights.
To turn on the lights, toggle the switch to the desired mode. The modes are, full bright and automatic.

- LEDs do not require any warm-up or cool-down time, and may be turned on and off at any time.
- When you turn on the LED lights, they reach full brightness instantly.

Lights that will not turn on

If the lights are not lit when the engine is running and power is applied, follow these steps:

1. Check the function switch to ensure it is not in the OFF position. If it is in the ON position and the lights still are not lit.
2. Turn function switch to OFF and stop the Engine.
3. Lower the mast (for instructions, see Section 4.5.4, page 25).
4. Ensure all plugs are fully engaged. (Control Box, Junction Box, and Generator)
5. If connections are secure, contact the Wanco Service Department (see Section 1.4, "Where to obtain service," page 2).

4.6.7 Optional equipment

Emergency engine stop

The emergency-stop (or E-stop) button allows the operator to quickly shut down the trailer engine. The button activates an electric fuel solenoid that shuts off fuel to the engine when activated.

The E-stop button is located next to the tower mast on the outside of the equipment cabinet. Access to the main control panel is not required for using the E-stop button.

The E-stop button is optional, auxiliary equipment that might not be included with your trailer.

Air-intake shutoff valve

The air-intake shutoff valve allows the operator to manually shut down the trailer engine in environments where combustible gas may be in the air around the trailer. The valve will automatically close if the engine speed accelerates due to environmental conditions.

The trailer engine runs on diesel fuel. Under normal circumstances, when the operator takes action to shut down the engine, the diesel fuel supply is shut off and the engine stops. However, in environments where combustible gases are present, the air supply to the engine might allow the engine to continue running. When the air-intake closes, it interrupts the engine's air supply, causing the engine to shut down.

The T-handle that is used for manually closing the valve is located next to the tower mast on the outside of the equipment cabinet. Access to the main control panel is not required to close the valve.

The air-intake shutoff valve is optional, auxiliary equipment that might not be included with your trailer.

- **Cold-weather package**
  The cold-weather package provides equipment that aid in starting the engine when temperatures are very low. The package includes an electric oil-pan heater, an electric engine block heater, and a GFCI receptacle with extension cable.

- To use the cold-weather engine-start aids, plug the extension cable from the GFCI receptacle into a 120-volt AC, 60-Hertz power supply (such as an AC power generator or a commercial power grid). DO NOT use the trailer engine to power the oil-pan heater or block heater. The extension cable MUST exit the equipment cabinet through the access port on the rear of the cabinet.

- The cold-weather package is an option that might not be included with your trailer.

Heavy-duty forklift pockets

Because large forklift forks will not fit in the standard forklift slots that are welded to the tower mast, oversized, heavy-duty forklift pockets are available for handling with large equipment. These pockets are installed under the tower frame and are accessible from either side of the Unit (see Section 4.4.4, page 20).

The heavy-duty forklift pockets are optional, auxiliary equipment that might not be included with your runway closure trailer.

Containment Switch

Because it is not always clear if there is fluid in the containment pan, a switch is available that will light a beacon when the pan has fluid in it. If the pan continues to fill up a second switch will shut down the engine to protect the components.

5 Maintenance

5.1 Read before servicing

IMPORTANT!

The trailer is equipped with a battery bank to provide constant power to the lights. You should always have the engine running while operating the lights.
Failure to do so will drain the battery bank and will cause the lights to turn off.

5.2 Safety

⚠ DANGER

High voltage.

Contact with live electrical circuits will result in serious injury or death.

- Before servicing any component on the trailer, turn off power, then disconnect cables from battery.
- Only a qualified electrician should service the light tower electrical system.

⚠ CAUTION

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

Whenever possible, perform maintenance indoors.

CAUTION

Pressure wash could damage control panel and electronics.

Use a slightly damp, soft cloth to clean control panel when necessary.

The engine is permanently grounded to the trailer. NEVER perform even routine service before disconnecting battery cables: first from the positive (+) battery terminal, then from the negative (–) terminal.*

Before performing any type of service or maintenance, read and follow all safety instructions. See Section 2.5, page 7.

**Removing the positive cable first is a requirement specifically for negative-ground systems.*

5.3 Routine inspection

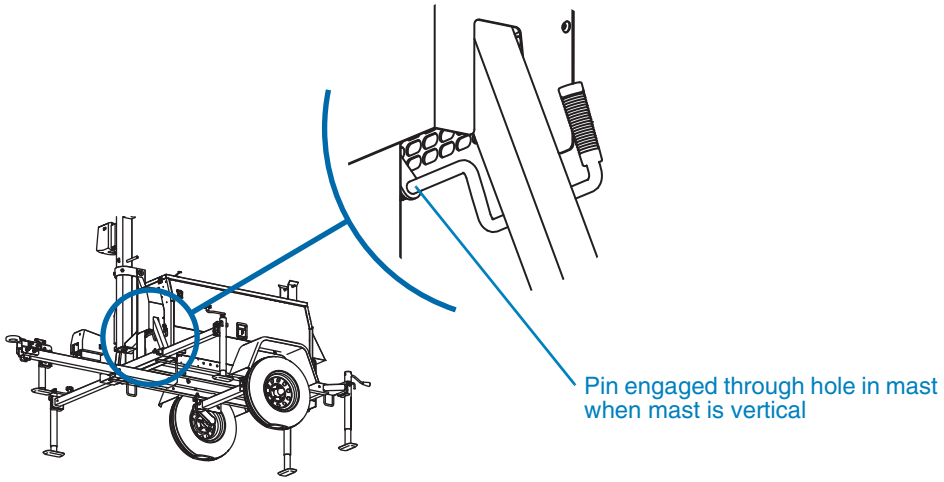
Before performing any type of service or maintenance, read and follow all safety instructions. See Section 2, page 3.

When the runway closure trailer is in regular use, you should routinely perform the following maintenance checks:

- Check fluid levels and look for leaks. Refill fluids if necessary. Repair leaks before using the runway closure trailer.
- Check the containment pan for fluid. The containment pan is located at the bottom of the equipment cabinet. If fluid is present, use the drain plug under the trailer to drain the pan before using the light tower (see Figure 4-1, page 16).
- Inspect all exposed wiring for damage, worn insulation, and cuts. Repair or replace if necessary.
- Inspect winch cable for wear and damage. Repair or replace if necessary.
- If the runway closure tower is deployed, verify the vertical-lock pin is engaged and secure (see Figure 5-1).

Repair or replace worn and damaged components immediately. Never use any equipment that is damaged or in need of repair.

Figure 5-1. Vertical-lock pin



5.4 Servicing the engine

5.4.1 Before servicing

Before performing any type of service or maintenance, read and observe all service safety instructions. See Section 2.5, page 7.
For engine-related maintenance and servicing, see the engine manual. (The engine manual is available for download from the engine manufacturer's website.)

- To drain engine oil and coolant, see below.
- To check and refill coolant, see Section 5.4.3, page 38).

5.4.2 Draining engine oil

If the trailer has a fluid containment pan (located at the bottom of the equipment cabinet), draining the engine oil requires the following steps:

1. Ensure there is no fluid in the containment pan. If fluid is present, it will flow through the drain hole when the plug is removed in Step 3. Be prepared to capture the fluid and prevent it from spilling onto the ground.
2. Start the engine and allow it to warm up. For engine operating instructions, see Section 4.6, page 26.
3. Locate and remove the containment pan drain plug. The plug is located under and near the back of the trailer (see Figure 5-2).

4. Locate the engine oil drain hose, which is connected to the bottom of the engine block inside the equipment cabinet. The other end of the hose is loose and lying in the containment pan. The loose end of the hose has a plug inserted into it, while the end of the hose connected to the engine has a valve. See Figure 5-3.
5. Route the drain hose through the drain hole in the bottom of the containment pan.
6. Put the hose in an oil drain pan, a bucket, or another container to capture the engine oil when the plug is removed. Before removing the plug from the loose end of the drain hose under the trailer, note that the hose might be full or partially full of oil.
7. Remove the plug from the end of the drain hose and let the contents of the hose drain into your container.
8. Open the drain valve at the engine end of the drain hose using the valve lever. The lever moves in two directions, as indicated in Figure 5-3. The oil will drain from the engine through the hose into your container.
9. When the engine oil has finished draining:
    a. Close the drain valve.
    b. Reinstall the plug at the loose end of the drain hose.
    c. Pull the hose from the containment pan drain hole and lay it in the pan.
    d. Reinstall the containment-pan plug.

Figure 5-2. Containment-pan drain plug

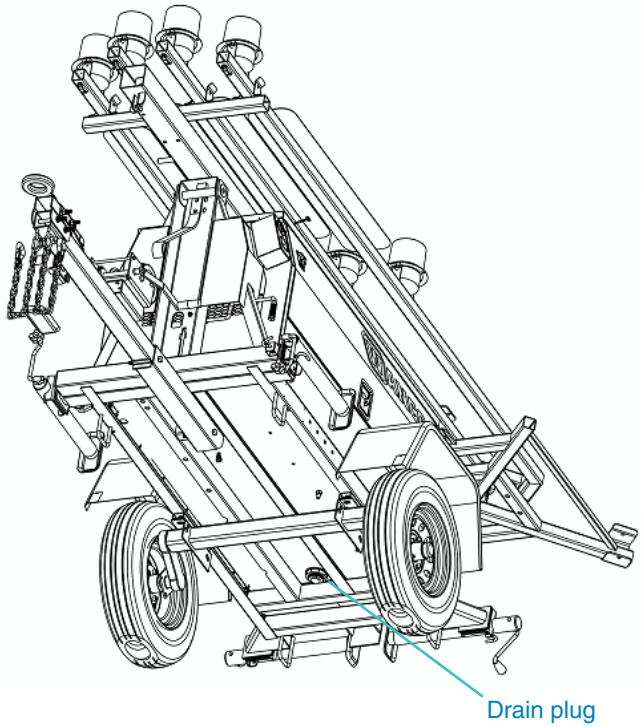
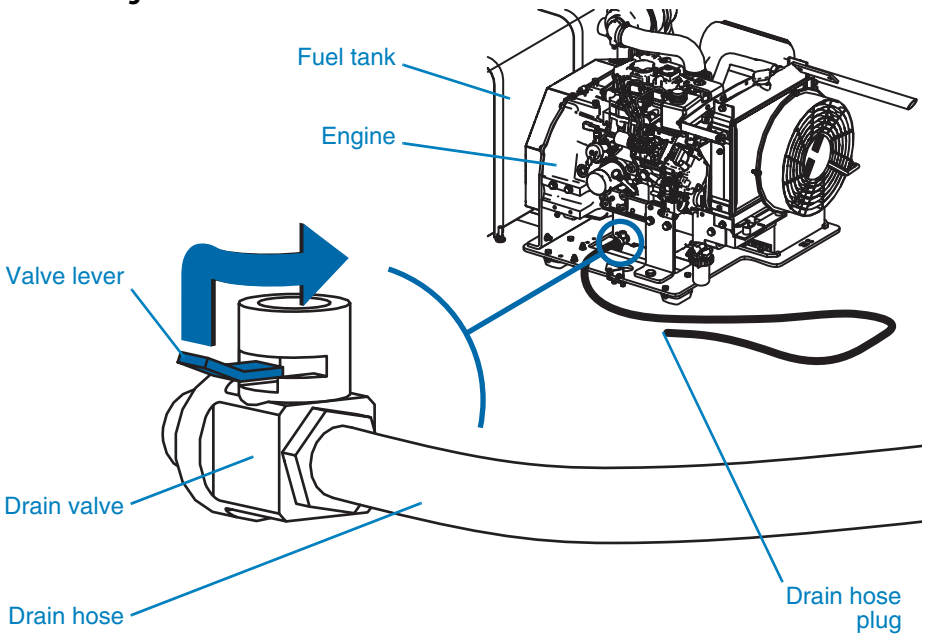


Figure 5-3. Engine-oil drain hose and valve



5.4.3 Coolant overflow and recovery

The engine is equipped with a coolant overflow bottle, which is also part of a coolant recovery system. When the engine is hot, the overflow/recovery bottle will have coolant in it, and may become full. When the engine is cool, the bottle may be empty or nearly empty. This is normal.

Do not add coolant to the system using the overflow/recovery bottle. Add coolant only at the radiator, and only when needed.

If the engine is cool and the overflow/recovery bottle is completely empty, check the coolant level at the radiator.

5.5 Wiring and replacement parts

For wiring diagrams and replacement parts, contact the factory (see Section 1.4, ”Where to obtain service,“ page 2).

5.6 Engine maintenance

5.6.1 Using the maintenance panel

Before performing any type of service or maintenance, read and follow all safety instructions. See Section 2, page 3.

Figure 5-4 calls out the components necessary for accessing the engine for routine maintenance and repairs. Access the engine using the two gull-wing side doors and the maintenance panel.

To raise the maintenance panel using the lifting chain:

1. When shipped from the factory, the lifting chain is attached to the enginre, next to the fuel tank inside the engine cabinet. Remove the chain from inside the cabinet and connect it to the mast and maintenance panel.
   - Ensure the lifting chain is not twisted.
   - Ensure the chain is well connected to both the mast and the maintenance panel.
2. Release the two rubber draw-latches located inside the engine cabinet (see Figure 5-5).

Figure 5-4. Engine access

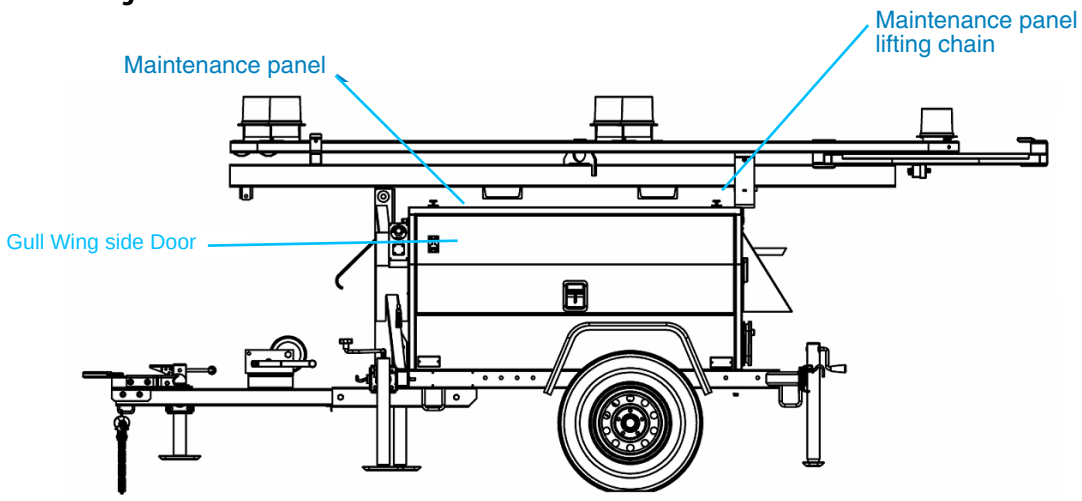
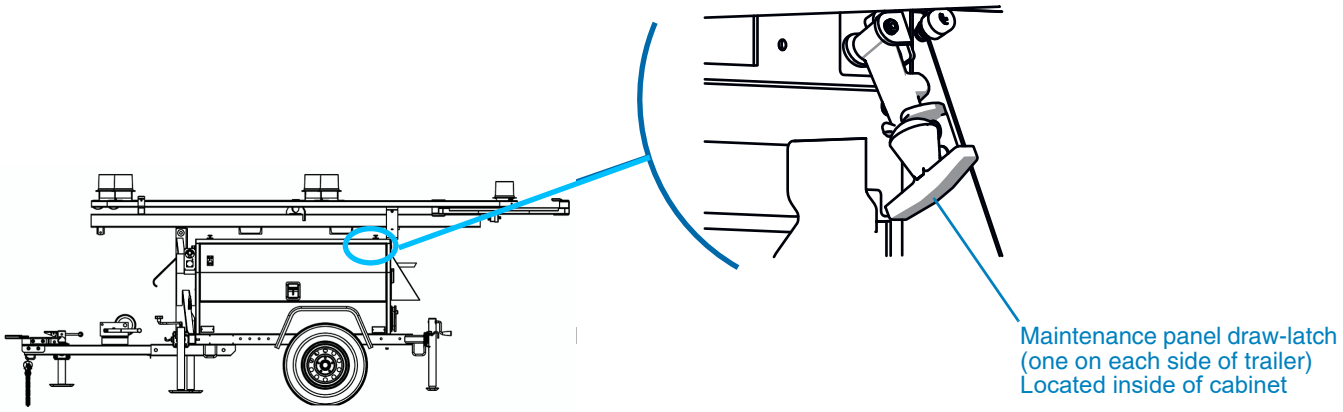


Figure 5-5. Maintenance panel draw-latches



⚠ CAUTION

Improperly raising the maintenance panel could damage equipment and cause personal injury.

- Do not raise the maintenance panel before releasing its two rubber draw-latches and closing both side doors.
- Keep all body parts clear of the path of the maintenance panel, both above and below it, while it is being raised.
- Raise the panel fully by deploying the mast.

3. Close both side doors.

4. Raise the runway closure trailer mast, and the attached panel, using the drawbar-mounted winch (see the runway closure trailer user's manual). Raise the panel fully, bringing the mast to vertical so that the vertical-lock pin engages.

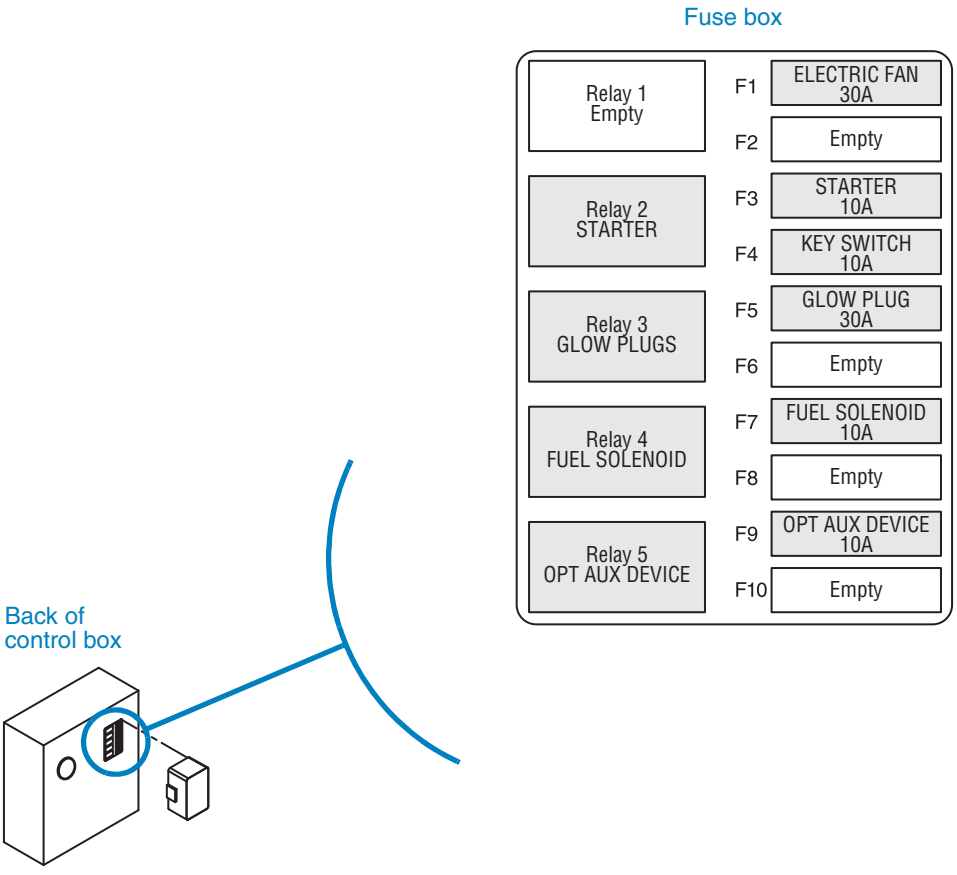
When maintenance is complete, lower the mast and maintenance panel, attach the two rubber draw-latches, detach the lifting chain, and store the chain by attaching it to the generator next to the fuel tank.

5.7 Fuses and relays

Check and replace fuses when necessary.

The fuse box is located on the back of the control box (Figure 5-6) and is accessed from the right side or the top of the runway closure trailer.

Figure 5-6. Fuses and relays



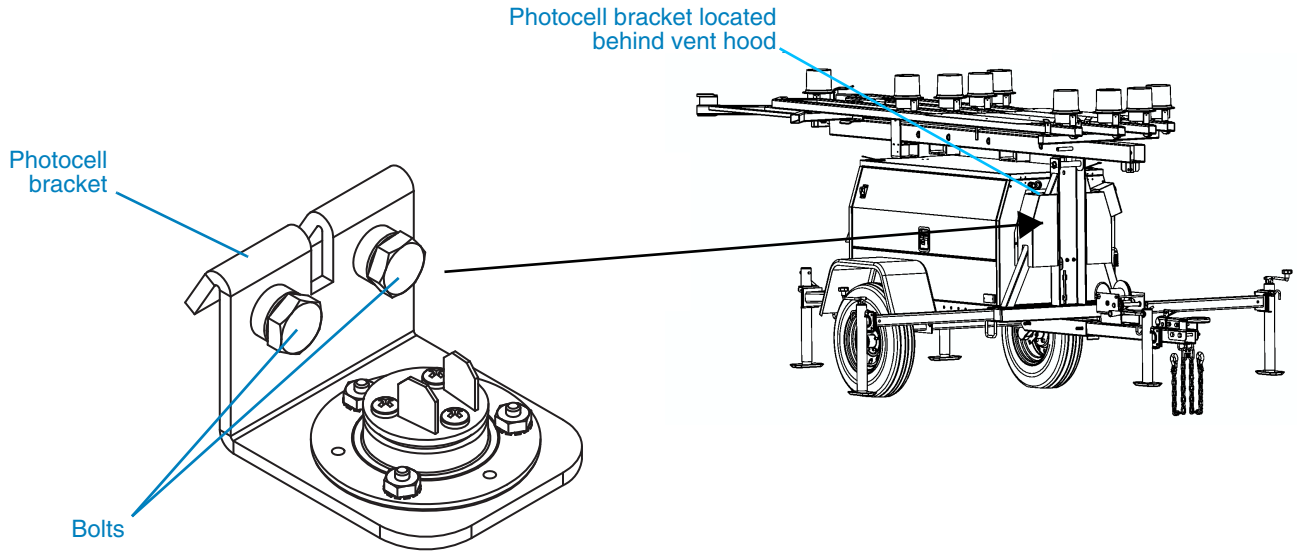
5.8 Photocell adjustment

The photocell automatically controls light brightness on the runway closure trailer, turning the light tower to dim at dusk and full bright at dawn and during the day . The system uses a photocell sensor to detect ambient light levels around the trailer.

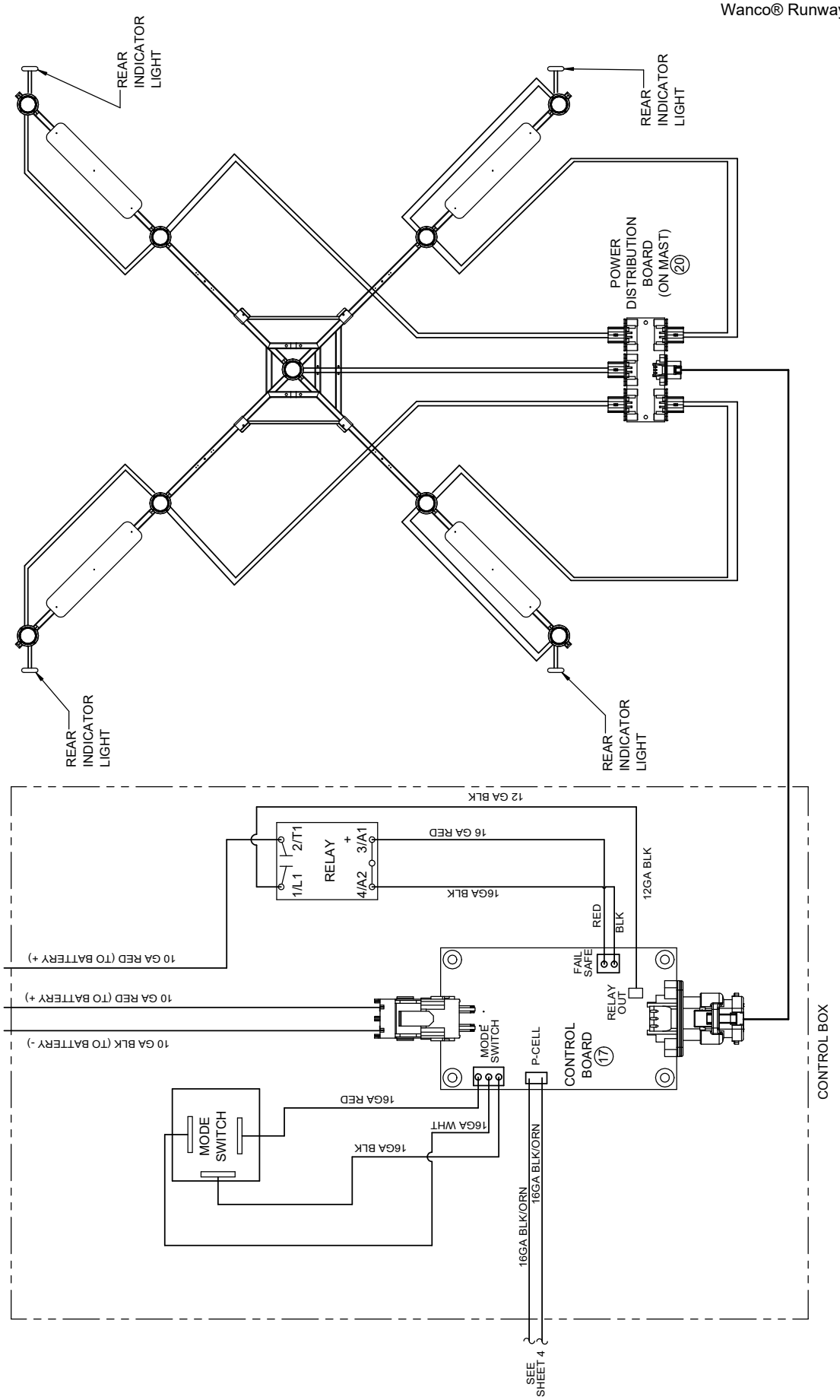
To change the photocell position, refer to Figure 5-7 and follow these steps:

1. While facing the front of the runway closure trailer, identify and remove the vent hood to the left of the runway closure trailer mast.
2. Loosen the two bolts that hold the photocell bracket in place.
3. Using care not to affect the photocell wiring connections, slide the bracket up, out of its vent slot, and move it up or down, inserting it into another slot. Moving the photocell changes both the dim and full bright times:
   - Moving the bracket higher will cause the photocell to receive less ambient light. As a result, the auto dimming system will dim the runway closure trailer lights earlier in the evening and go to full bright later in the morning.
   - Moving the bracket lower will cause the photocell to receive more ambient light. As a result, the auto dimming system will dim the runway closure trailer lights later in the evening and go to full bright earlier in the morning.
4. Tighten the bolts to secure the bracket in place.
5. Reinstall the vent hood.

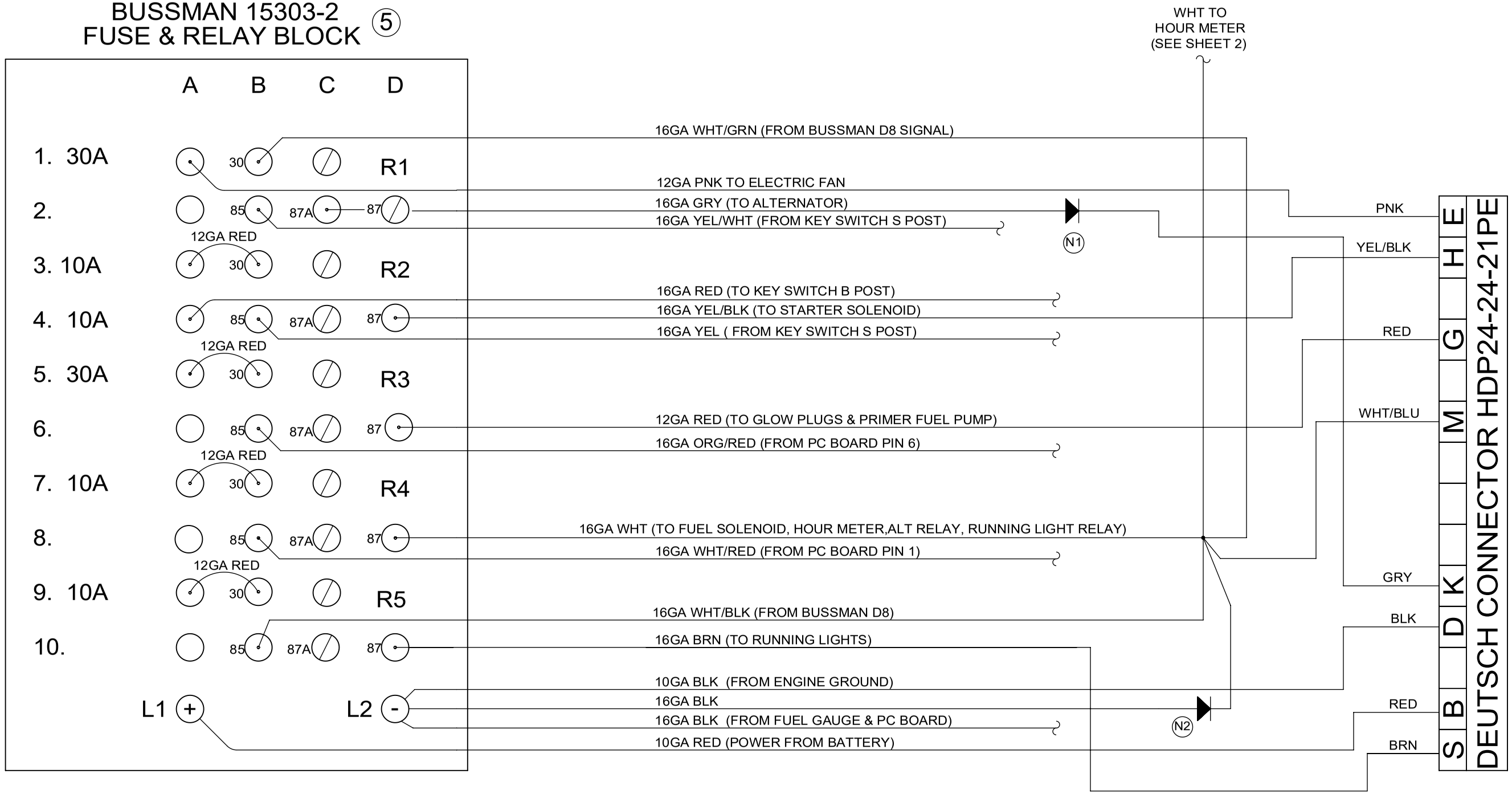
Figure 5-7. Photocell bracket



6.1 X-Beacon wiring diagram



NOMENCLATURE
DM2 - DEUTSCH MALE 2 PIN DT06-2S
DF2 - DEUTSCH FEMALE 2 PIN DT04-2P
DM3- DETUSCH MALE 3 PIN DT06-3S
DF3 - DEUTSCH FEMALE 3PIN DT04-3P



FUSES
1. ELECTRIC FAN (OPTIONAL)
2. EMPTY
3. STARTER RELAY
4. KEY SWITCH POWER
5. GLOW PLUG RELAY
6. EMPTY
7. FUEL SOLENOID RELAY
8. EMPTY
9. RUNNING LIGHTS RELAY
10. EMPTY

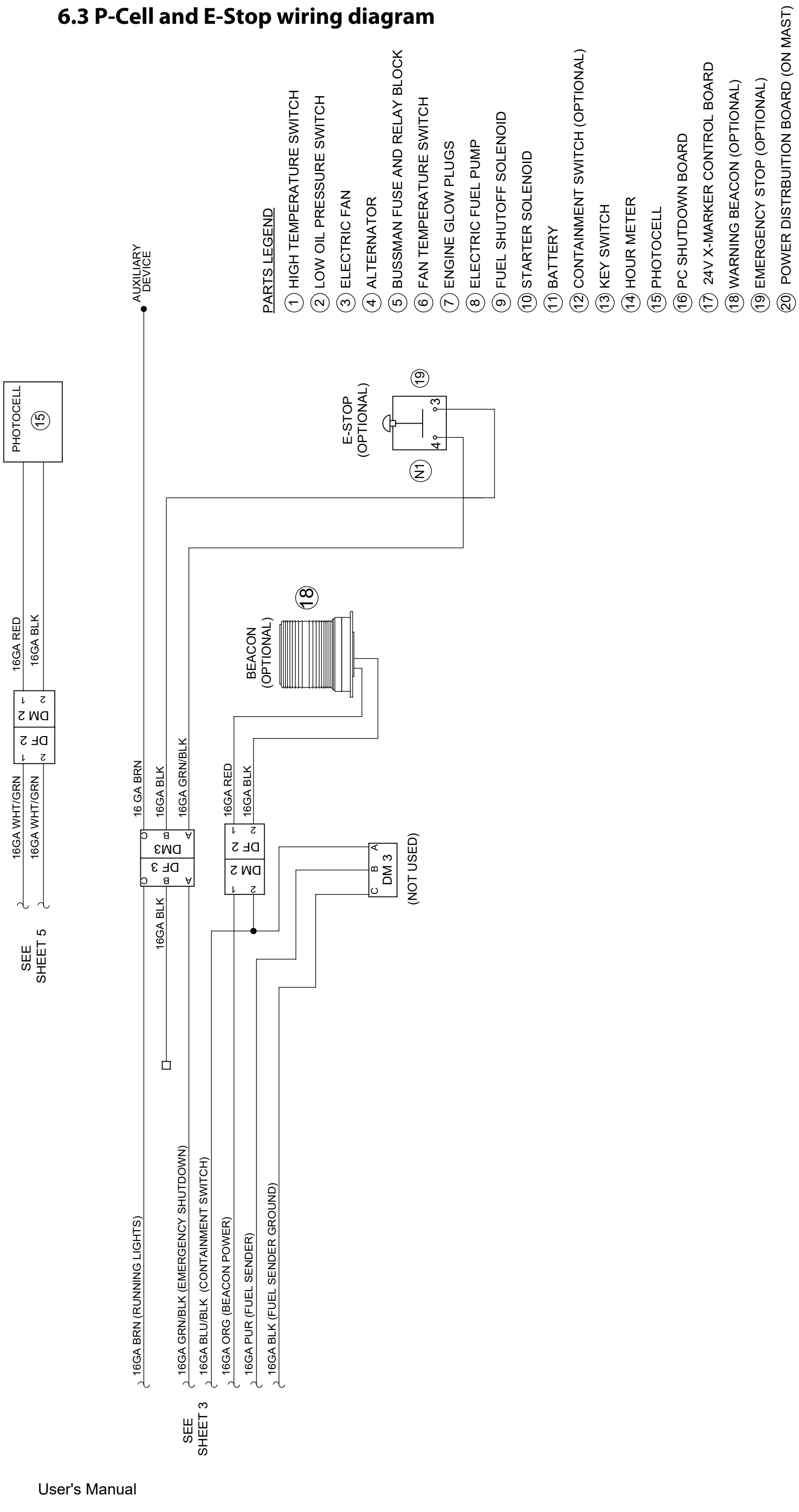
L1 12 VOLTS POSITIVE BUSS
L2 GROUND BUSS

RELAYS
R1 ALTERNATOR START DISCONNECT
R2 STARTER
R3 GLOW PLUGS
R4 FUEL SOLENOID
R5 RUNNING LIGHTS (OPTIONAL)

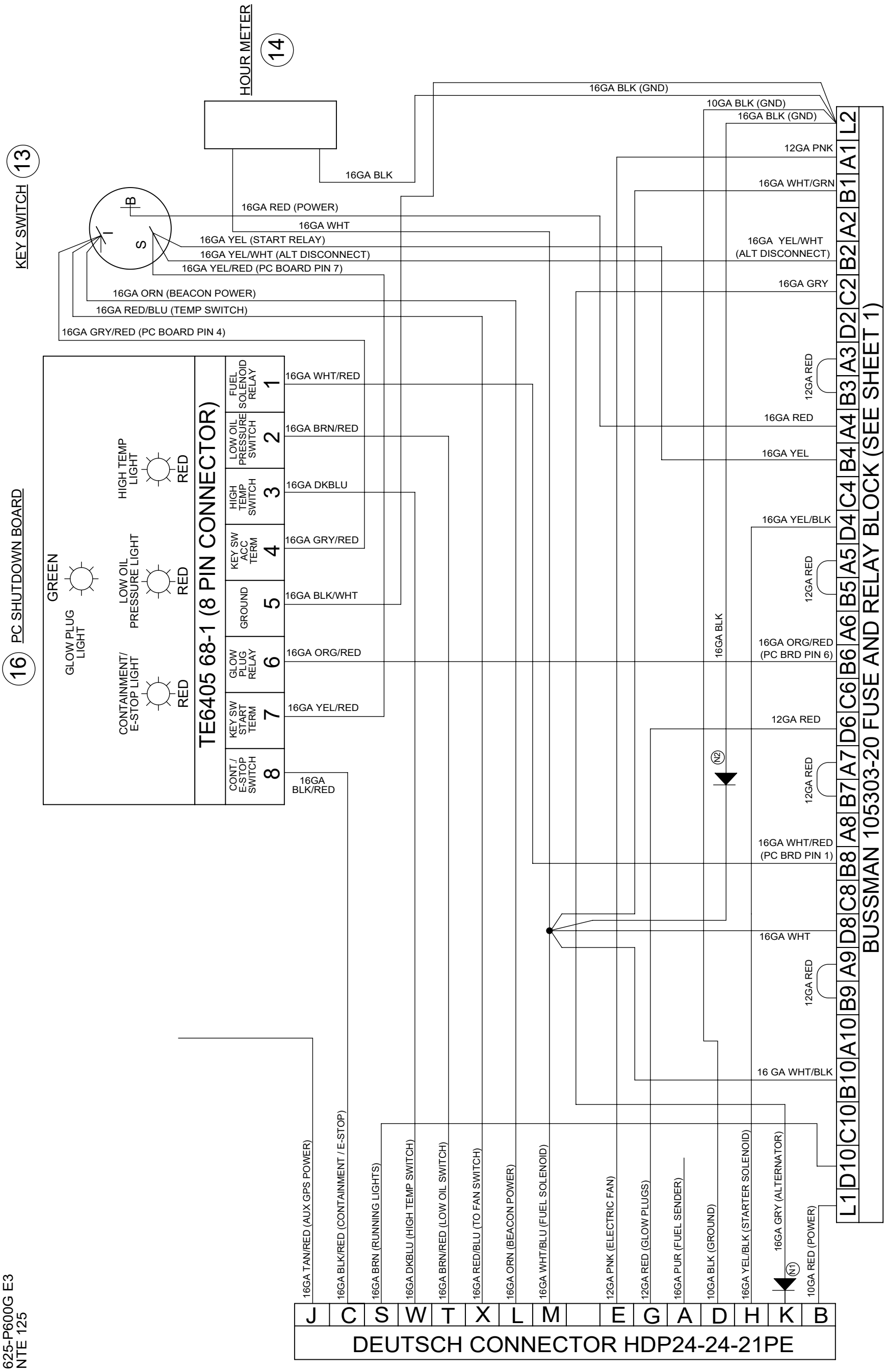
NOTES:
N1 : DIODE - 625-P600G E3
N2 : DIODE - NTE 125

RELAY 86 IS BUSS GROUNDED TO
L2 COMMON GROUND

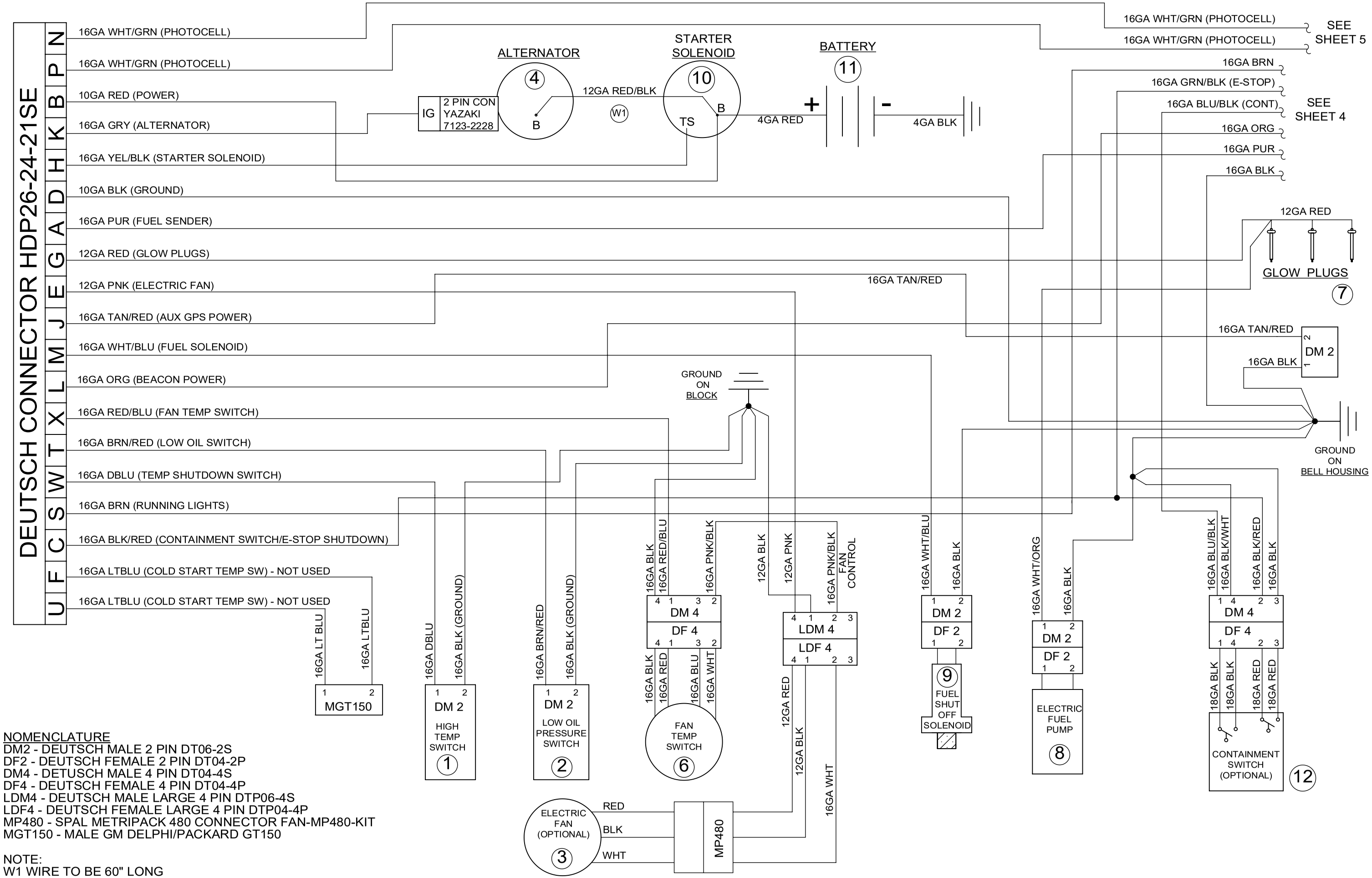
6.3 P-Cell and E-Stop wiring diagram



6.4 Engine Controller Wiring diagram



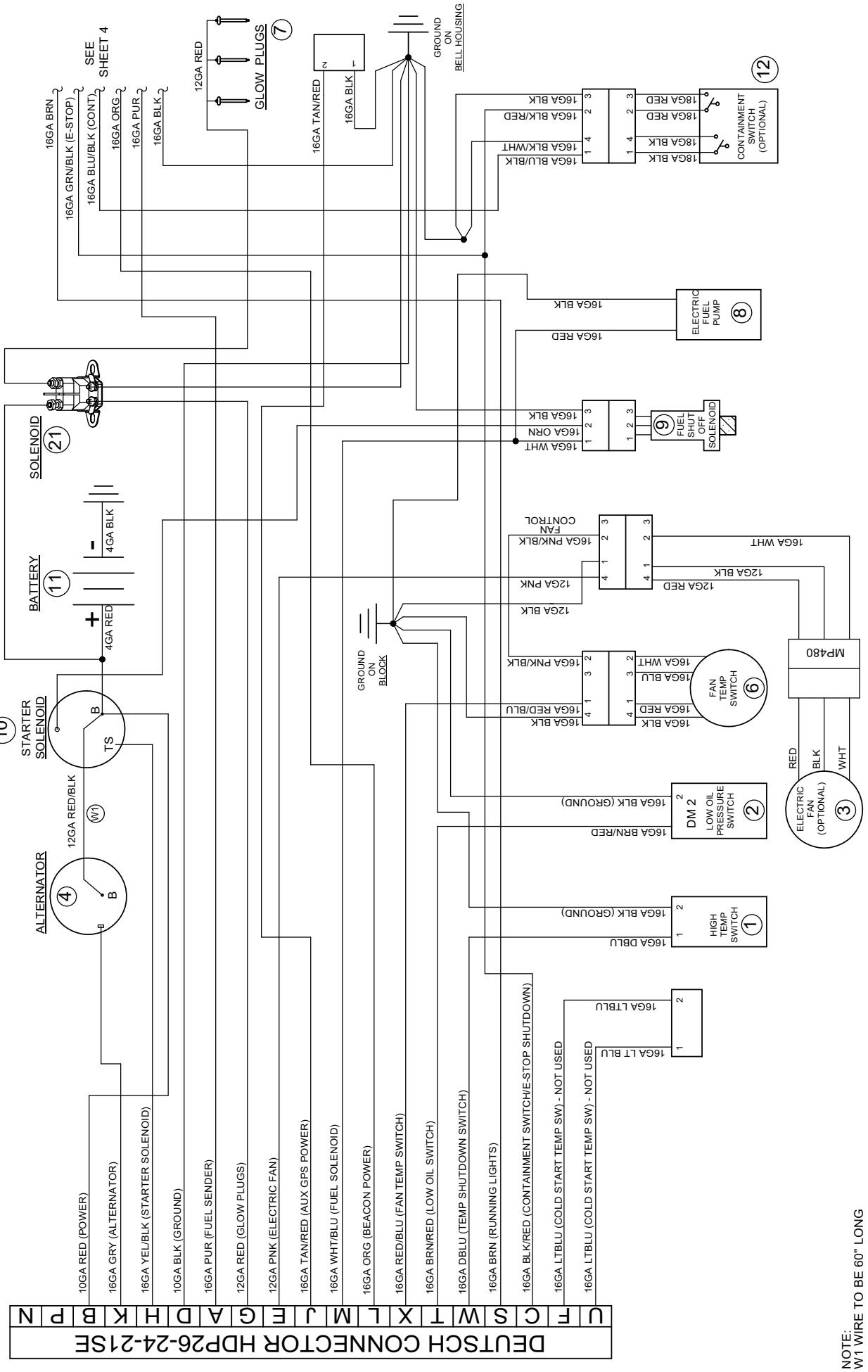
NOTES:
N1 : DIODE - 625-P600G E3
N2 : DIODE - NTE 125



NOMENCLATURE
DM2 - DEUTSCH MALE 2 PIN DT06-2S
DF2 - DEUTSCH FEMALE 2 PIN DT04-2P
DM4 - DETUSCH MALE 4 PIN DT04-4S
DF4 - DEUTSCH FEMALE 4 PIN DT04-4P
LDM4 - DEUTSCH MALE LARGE 4 PIN DTP06-4S
LDF4 - DEUTSCH FEMALE LARGE 4 PIN DTP04-4P
MP480 - SPAL METRIPACK 480 CONNECTOR FAN-MP480-KIT
MGT150 - MALE GM DELPHI/PACKARD GT150

NOTE:
W1 WIRE TO BE 60" LONG

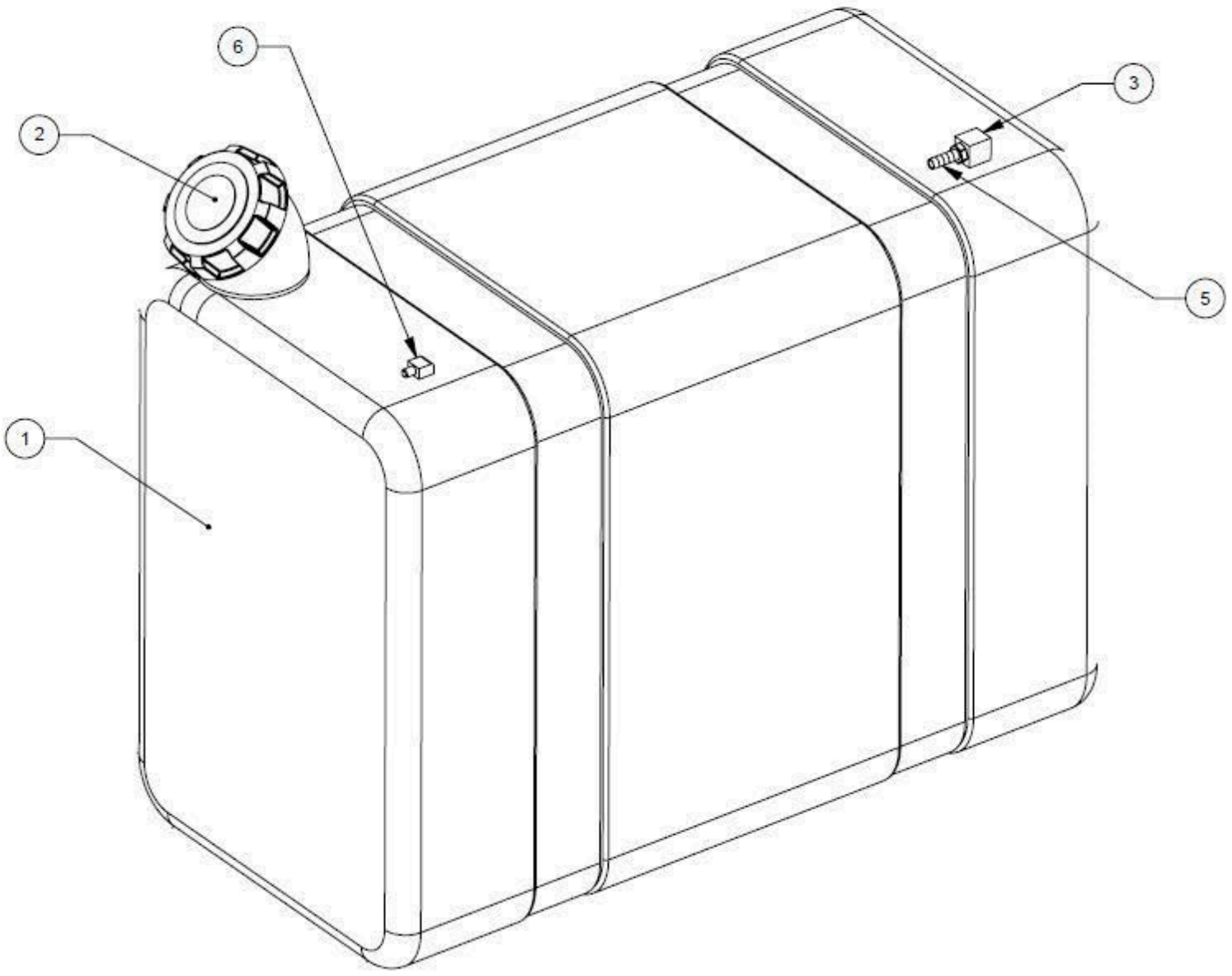
6.6 Engine Wiring diagram (Mitsubishi)



NOTE:
W1 WIRE TO BE 60" LONG

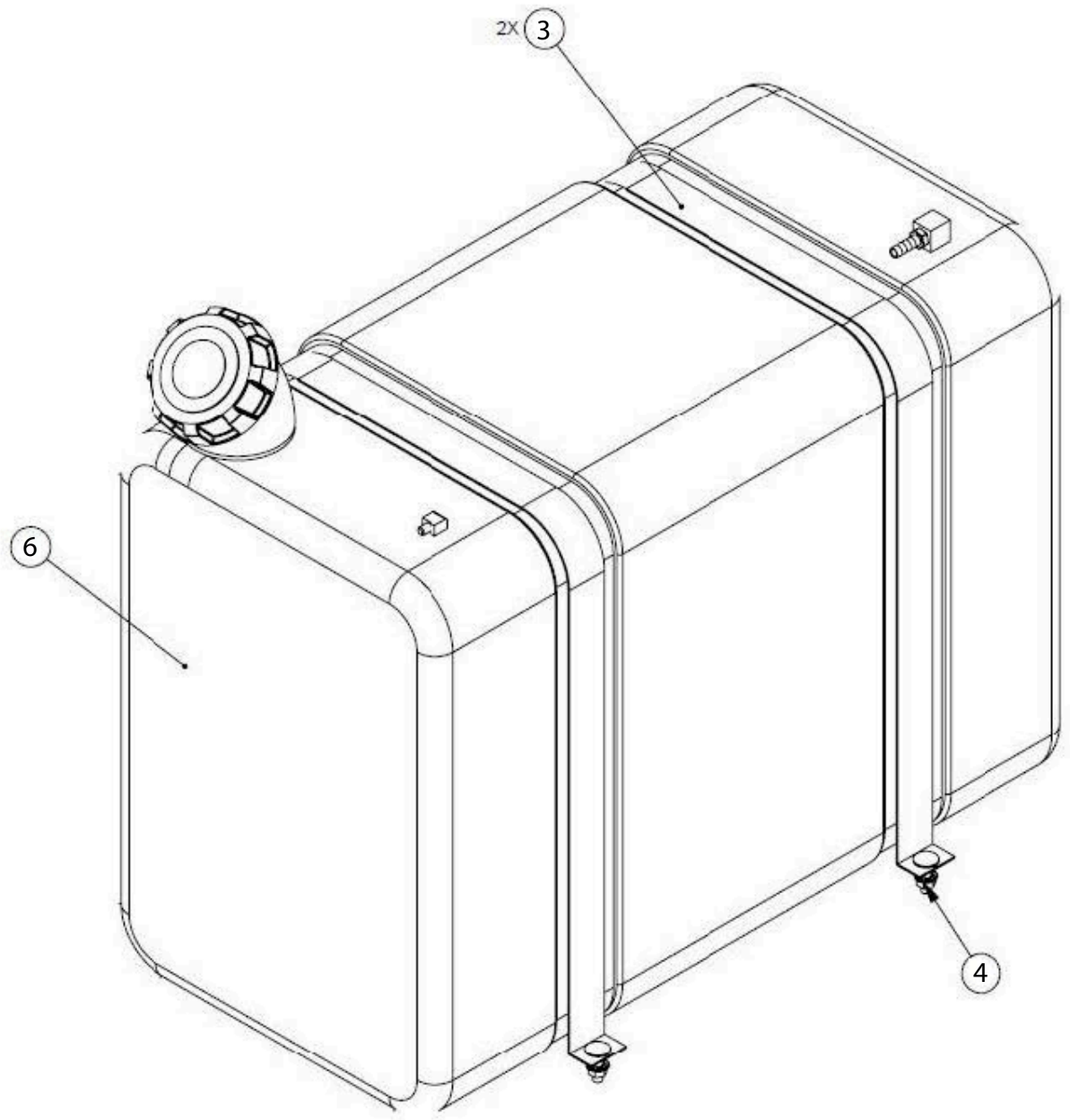
Wanco Runway Closure Trailer Parts Manual

7.1 Fuel tank assembly



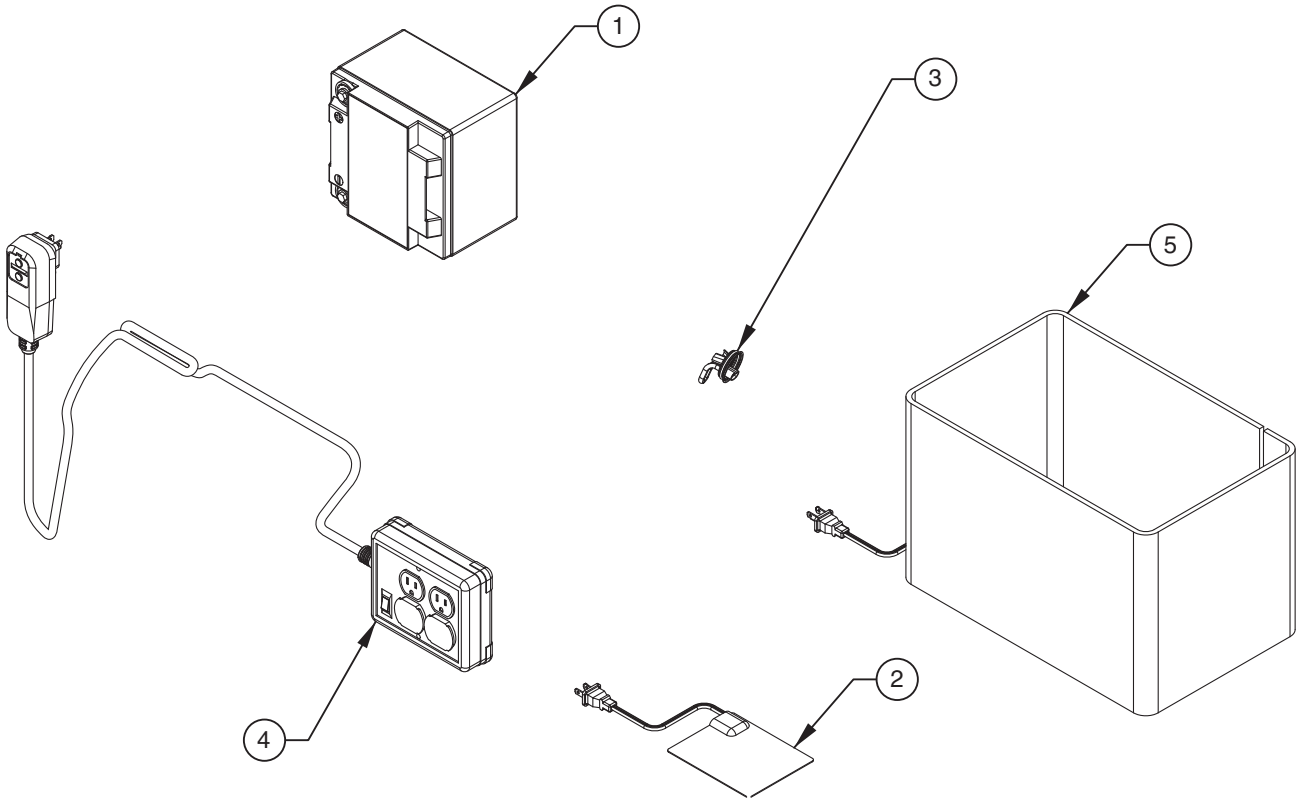
Item	Part No	Description	Qty
1	105726	TANK-FUEL, DIESEL, WCT	1
2	105406	CAP-FUEL, 3.5", PLASTIC	1
3	104921	STAND PIPE-18.75 LG, 1/2" DIA W/ STRA	1
4	103022	FTG-PLUG, BRASS HX HD, 3/8NPTM (Not Shown)	1
5	100386	FTG-BARB, 1/4NPTMX1/4 BARB	1
6	100384	FTG-ELBOW, 1/4NPTMX250 BARB	1

7.2 Fuel tank hold-down assembly



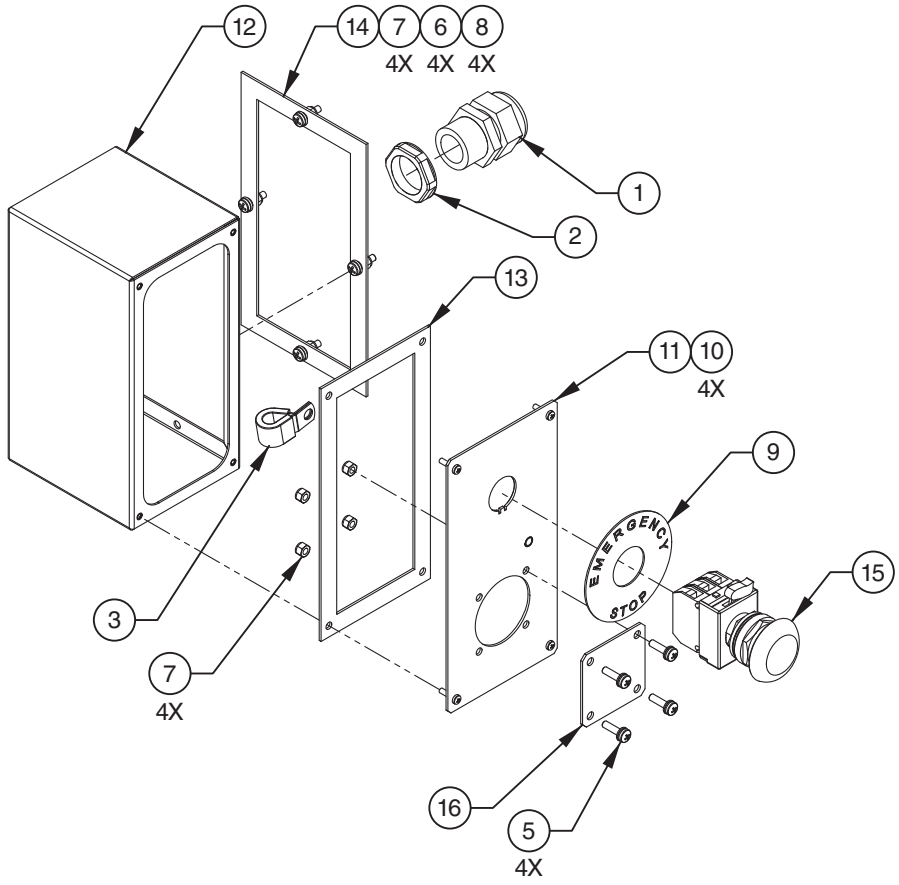
Item	Part No	Description	Qty
3	200497	STRAP-FUEL TANK, 30 GAL, LTC4L, PC BLK	2
4	201371	ASSY, HDW, FUEL TANK, STRAP	1
6	105726	FUEL TANK ASSY	1

7.3 Cold-weather start kit (optional equipment)



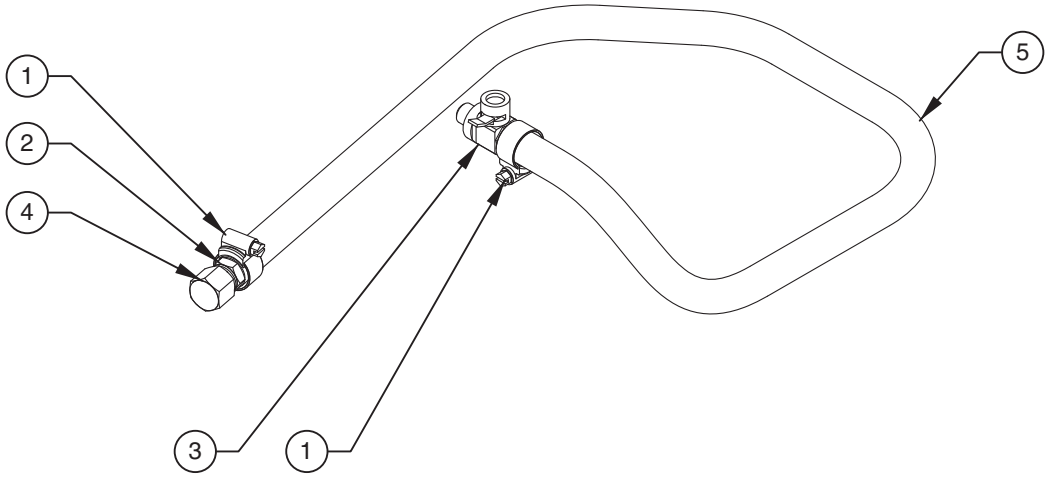
Item	Part No	Description	Qty
1	211940	AGM BATTERY	1
2	212557	OIL PAN HEATER	1
3	212558	BLOCK HEATER (CORD NOT SHOWN)	1
4	212661	GFCI RECEPTACLE ASSEMBLY	1
5	212926	BATTERY HEATER	1

7.4 E-stop assembly (optional equipment)



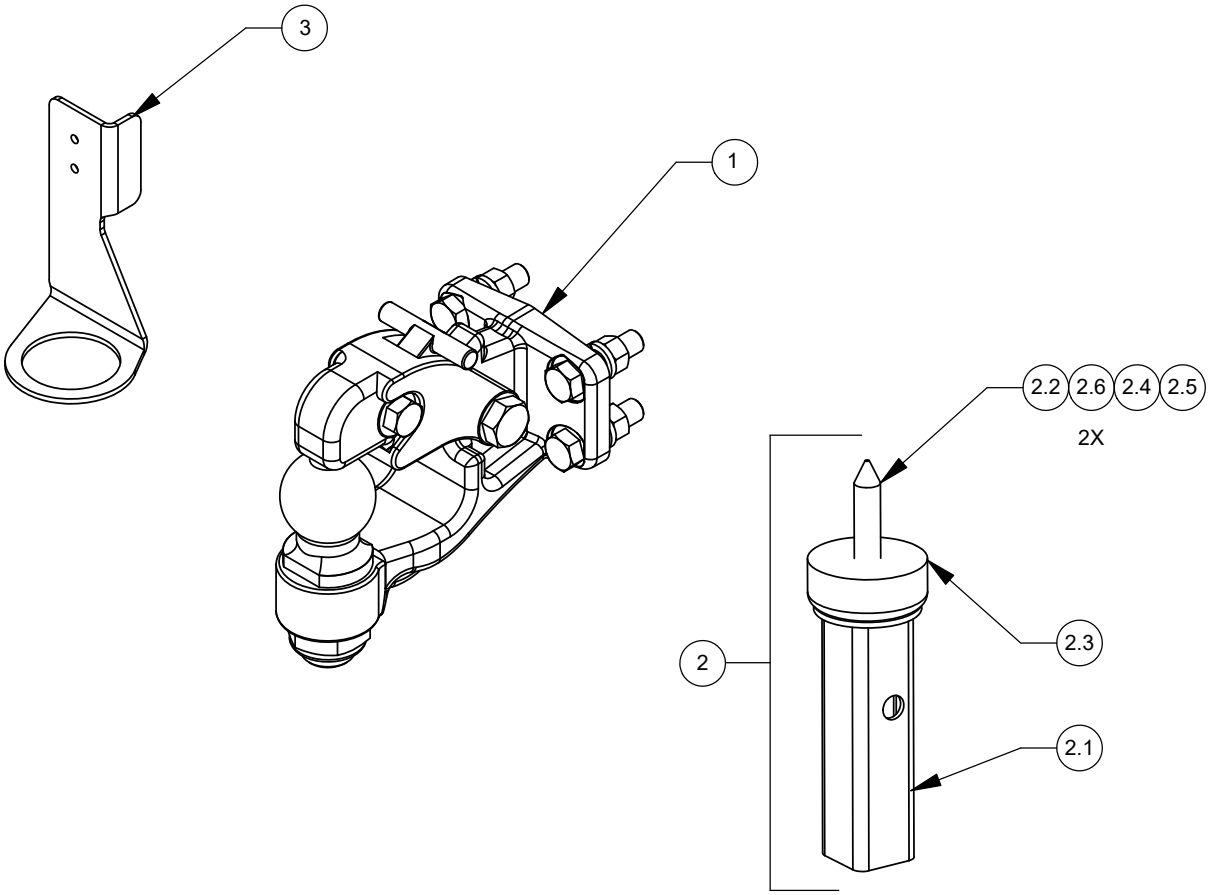
Item	Part No	Description	Qty
1	100135	CORD GRIP, 3/4" NPT	1
2	219846	LOCKNUT, 3/4" NPT	1
3	101582	P-CLAMP	1
5	105795	PAN-HEAD SCREW, M4-.7 X 16	4
6	105795	PAN-HEAD SCREW, M4 X 15	4
7	218464	HEX NUT, NYLON INSERT LOCK M4-.7	8
8	106001	FLAT WASHER, M4	8
9	106014	LABEL PLATE	1
10	106438	PAN-HEAD SCREW, M3 X 12	4
11	106639	CONTROL BOX COVER	1
12	106640-001P2	CONTROL BOX	1
13	107169	COVER GASKET	1
14	107562	CONTROL BOX GASKET	1
15	108259	EMERGENCY SWITCH	1
16	211408-P2	COVER PLATE	1

7.5 Oil drain hose assembly (optional equipment)



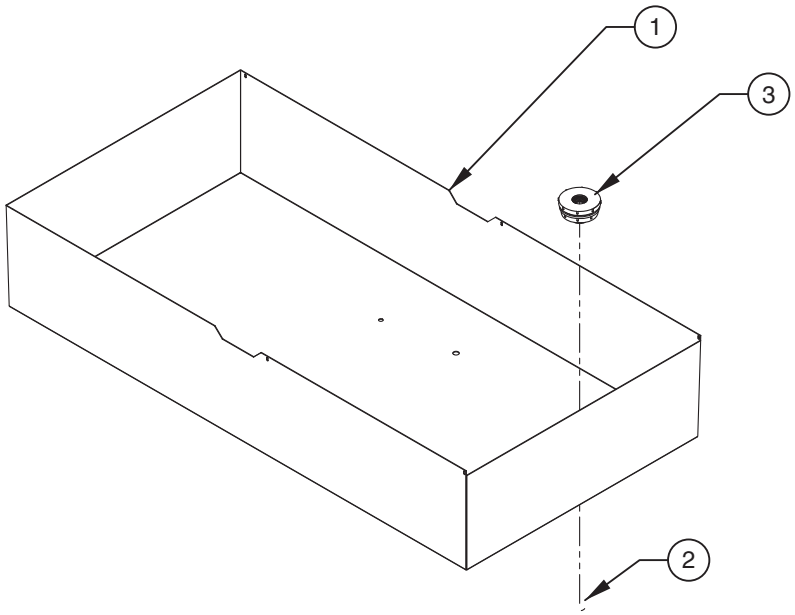
Item	Part No	Description	Qty
1	103006	HOSE CLAMP	2
2	106716	BARB FITTING, 3/8" NPT	1
3	212289	DRAIN VALVE	1
4	212759	CAP, 3/8" NPT	1
5	212760	DRAIN HOSE, 36"	1

7.6 Tandem tow accessories (optional equipment)



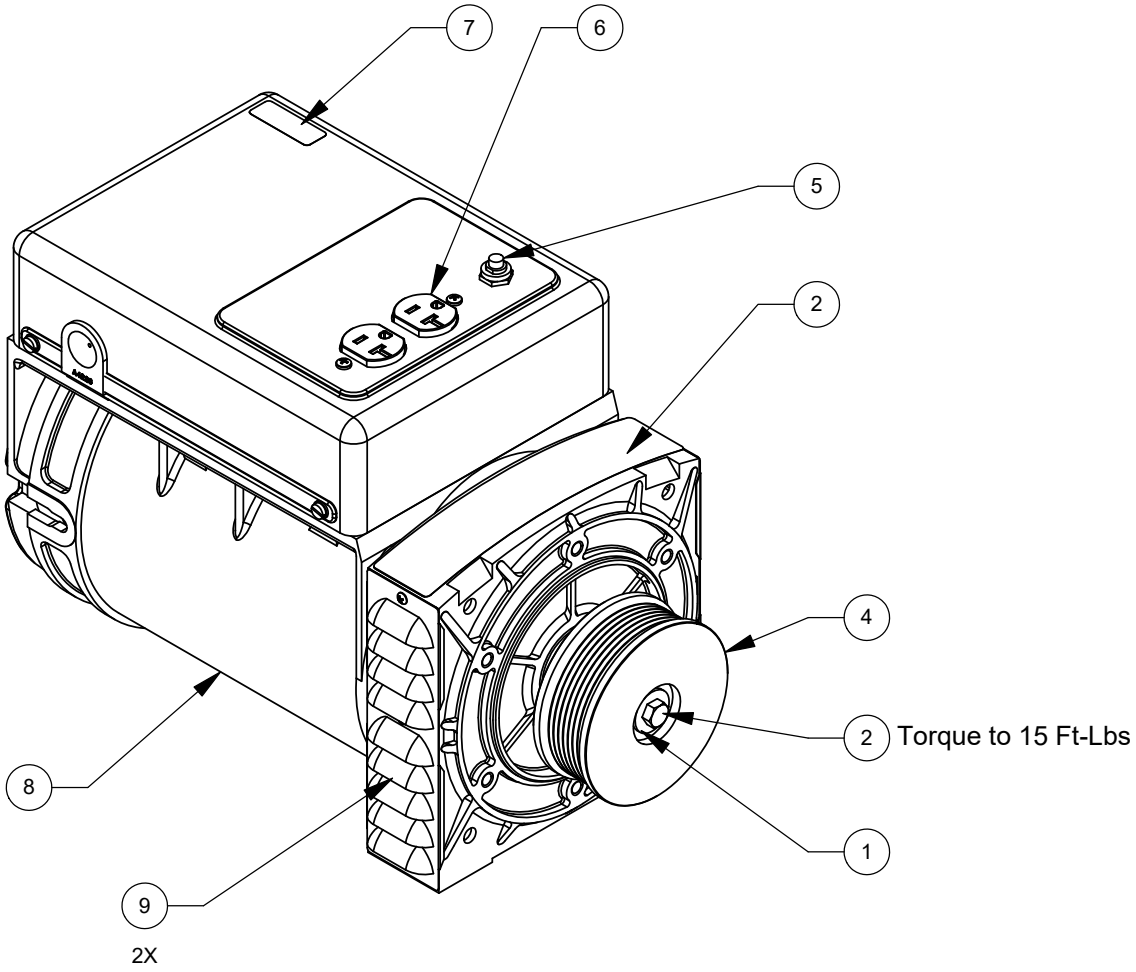
Item	Part Number	Description	Qty	Rev
1	223564	Hitch Combination Ball and Pintle Hook 2" 8-Ton	1	N/A
2	223579-C1	Prop Assembly Tandem Tow Runway Closure Marker	1	A
2.1	223578-P2	Prop Tandem Tow Runway Closure Marker	1	A
2.2	105621	Pin Chamfered M14 x 100mm Stainless Steel	1	N/A
2.3	102004	Bumper Rubber 2 1/2" x 1"	1	N/A
2.4	106006	Washer Flat M14 A-2 SS	1	N/A
2.5	106103	Washer Regular Split M14 Plain Zinc	1	N/A
2.6	218990	Nut Hex Finished M14-2.00mm Plain Cl8 Zinc	2	N/A
3	223583-P2	Bracket Prop Keeper Tandem Tow Runway Closure Marker	1	A

7.7 Containment pan assembly (optional equipment)



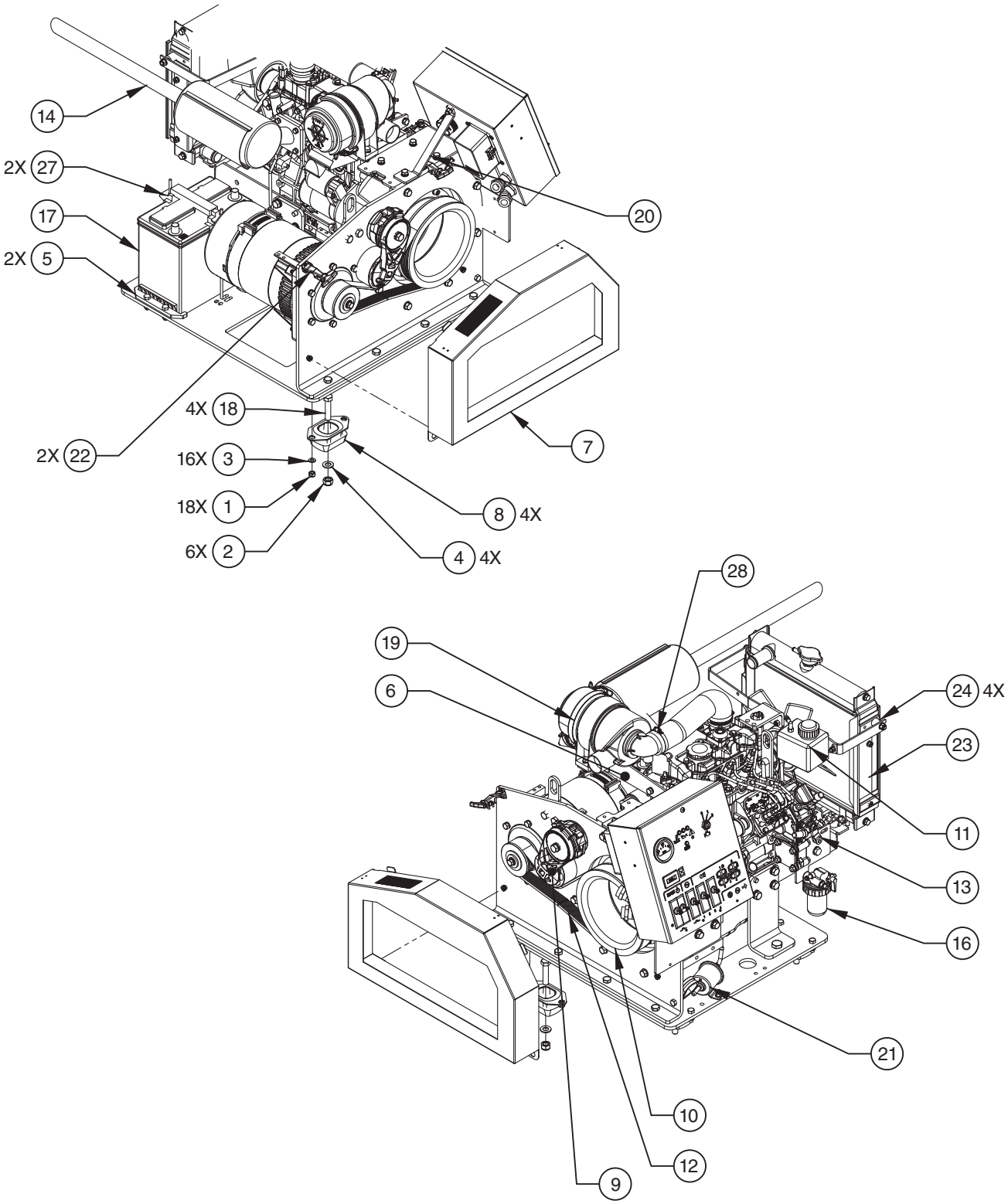
Item	Part No	Description	Qty
1	211800-P2	CONTAINMENT PAN	1
2	211878	DRAIN PLUG	1
3	211879	DRAIN FITTING	1

7.8 Generator assembly



Item	Part Number	Description	Qty
1	10620	Washer Flat 3/8" 316 SS	1
2	203838	Decal Warning Hazardous Voltage	1
2	211804	Screw Hex M8-1.25mm x 20mm Plain Cl8.8 Zinc	1
4	216495	Pulley K-Section 8-Groove 4.2"OD x 24mm Shaft Aluminum	1
5	217451	Circuit Breaker 20A 250V	1
6	217452	Receptacle Duplex CR20 20A 125V NEMA 5-20R	1
7	221422	Decal Indication Neutral Bonded To Frame	1
8	221802	Generator Brushless 1PH 2P 6.6KW 240V 60HZ No Coating/Cover	1
9	221863	Panel Louver Generator Screen Protection	2

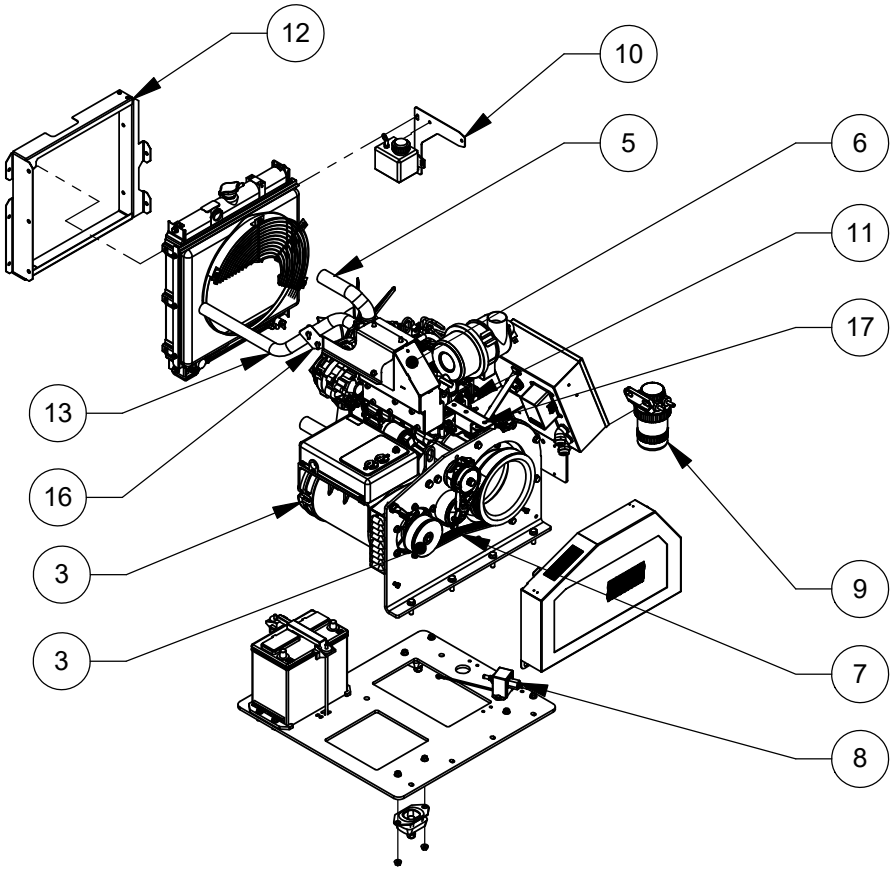
7.9 Engine assembly (Perkins)

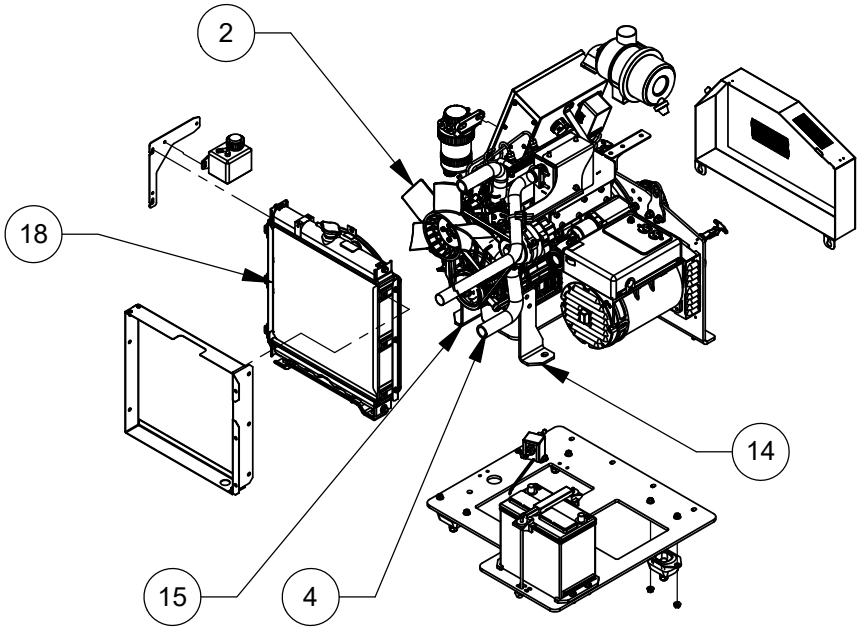


7.9 Engine Assembly (Perkins) parts list

Item	Part No	Description	Qty
1	105805	HEX NUT, NYLON INSERT LOCK M8- 1.25	18
2	105806	HEX NUT, NYLON INSERT LOCK M12-1.75	6
3	106003	FLAT WASHER, M8	16
4	106005	FLAT WASHER, M12	4
5	210590-P2	BATTERY BRACKET, BOTTOM STOP	2
6	214397-P2	AIR-FILTER BRACKET	1
7	211357-P	BELT GUARD	1
8	211490	VIBRATION MOUNT	4
9	211511	BELT TENSIONER	1
10	216494	PULLEY	1
11	211518	COOLANT BOTTLE	1
12	223799	DRIVE BELT	1
13	211520	DIESEL ENGINE	1
14	211522	MUFFLER	1
16	211564	FUEL FILTER	1
17	211565	BATTERY	1
18	211737	HEX SCREW, M12-1.75 X 55	4
19	211968	AIR FILTER KIT	1
20	212288-P2	CONTROL BOX BRACE	1
21	212292	FUEL PUMP	1
22	212295	RUBBER DRAW-LATCH	2
23	212298	RADIATOR MOUNTING BRACKET	1
24	212299	RADIATOR VIBRATION ISOLATOR	4
26	212555	AIR INTAKE HOSE	1
27	213114	BATTERY HOLD-DOWN BRACKET	1
28	213335	HOSE CLAMP, #28	2
29	212439	MAIN WIRING HARNESS (NOT SHOWN)	1

7.9.1 Engine assembly (Mitsubishi)

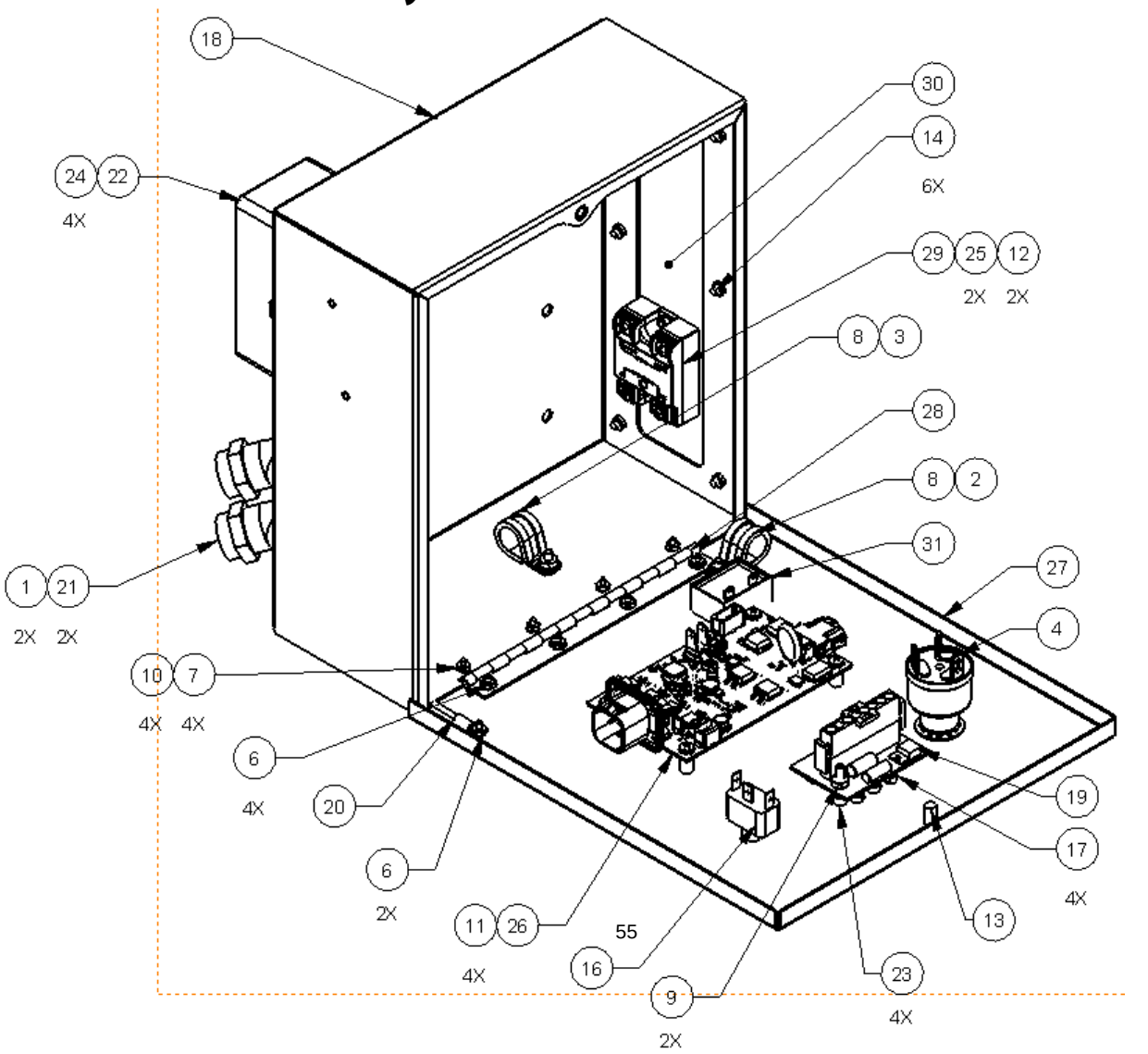


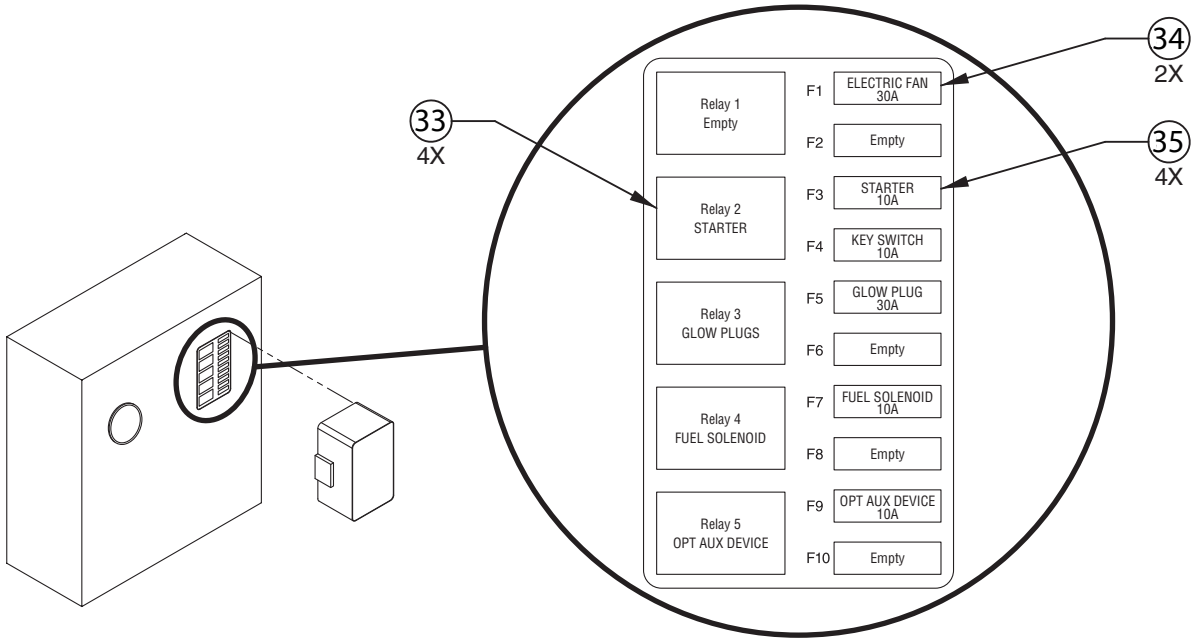


7.9.1 Engine assembly (Mitsubishi) parts list

Item	Part No.	Description	QTY
1	216495	Pulley K-Section 8-Groove 4.2"OD x 24mm Shaft Aluminum	1
2	220575	Engine Assembly Mitsubishi TDSL3-4516A_00_1_445	1
3	220647	Generator Assembly 6.6KW 1 Phase 2 Pole 60HZ 120VDC Duplex Receptacle	1
4	223603	Hose Radiator Lower Mitsubishi Light Tower	1
5	223604	Hose Radiator Top Mitsubishi Light Tower	1
6	223734	Muffler Assembly Mitsubishi	1
7	223799	Belt Drive K-Section 8-Ribs 43" Outside Length	1
8	224147	Pump Fuel Electric 12 VDC 4-6 PSI (0.03 MPA) 29 GPH	1
9	224415	Filter Fuel Water Seperator Mitsubishi	1
10	224469-P2	Bracket Mount Overflow Radiator Small Kubota	1
11	224862	Solenoid 12 Volt 80 Amp 50% Duty Cycle	1
12	224967-P2	Shroud Assembly Mount Radiator Kubota	1
13	224968	Tube Exhaust Mitsubishi Manifold Muffler	1
14	224969-P2	Mount Engine Mitsubishi Left Front	1
15	224970-P2	Mount Engine Mitsubishi Right Front	1
16	225663-P2	Bracket Support Tube Exhaust Manifold Muffler Mitsubishi	1
17	225664-P2	Intake Mount bracket	1
18	225668	Radiator Kubota Small D1105	1

7.10 Control box assembly

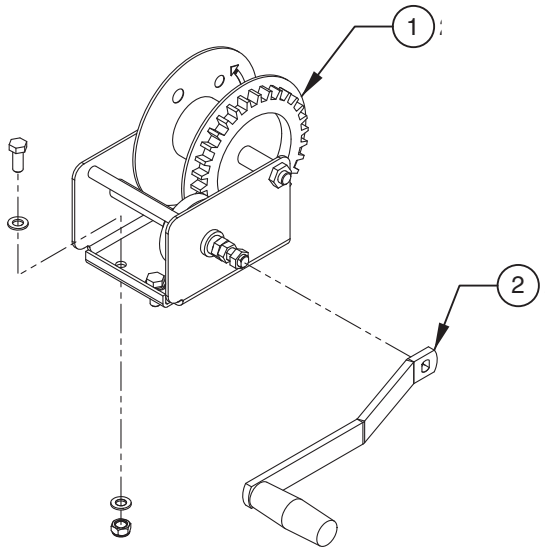




Control box assembly parts list

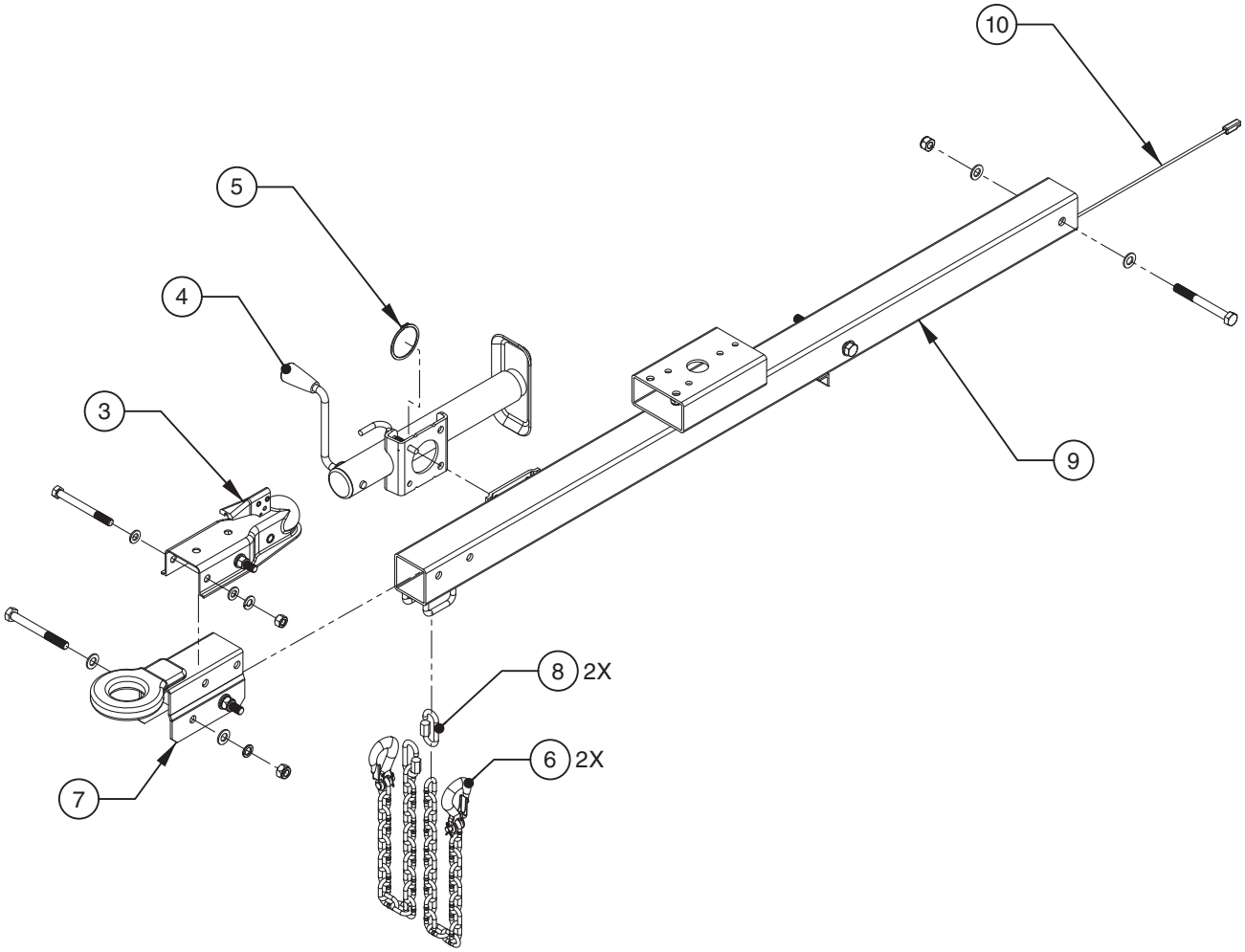
Item	Part Number	Descirpiton	Qty
1	100133	Nut Conduit 1/2"-14 NPT Zinc Plated	2
2	101489	Nut Lock Nylon #10-24 Regular NE Plain Gr5 Zinc	1
3	203694	Nut Lock K #10-32 18-8 SS	1
4	101759	Switch Key Ignition 3 Position 5/8" Dia	1
5	102552	Tie Cable 18LB 3/32"x8" Nylon 6/6 Black	7
6	103124	Nut Lock K #6-32 Plain Gr5 Zinc	6
7	103828	Nut Lock K #4-40 Plain Gr5 Zinc	4
8	104488	Clamp P 3/4" ID #10 Screw Zinc Plated Steel	2
9	103534	Nut Lock K #8-32 Plain Gr5 Zinc	2
10	105619	Screw Button Head #4-40 x 3/8" x Full Plain Gr5 Zinc w/Flat Washer	4
11	105688	Machine Screw Pan #8-32 x 3/8" Phillips Plain Zinc w/Ext Tooth Washer	4
12	106555	Nut Lock K M4-0.7mm Plain Cl8 Zinc	2
13	203684	Machine Screw Pan 1/4"-20 x 1/2" Phillips 18-8 SS	1
14	205242	Machine Screw Pan #8-32 x 3/8" Phillips Plain Zinc w/Spring Tension Washer	6
15	205895	Decal Warning Visually Verify Operation	1
16	206434	Switch Toggle SPDT 3 Position On-Off-On Panel Mount	1
17	211526	Plug Window Clear 5/16 Diameter	4
18	211546-P2	Control Box Enclosure Perkins Flat Black	1
19	211573	Shutdown PCBA Perkins 403D-07	1
20	211743	Wire Assembly Ground Control Box to Cover	1
21	212293	Cord Grip 1/2NPT 45° .50-.63 Cable Aluminum	2
22	212297	Harness Assembly Control Box Keystart	1
23	213843	Standoff Round.166ID x .313OD x .188L,Nylon	4
24	101805	Screw Pan Head #10-32 x 1/2" Phillips Plain Zinc	4
25	218463	Machine Screw Pan M4-0.7mm x 10mm Phillips Plain Zinc w/Spring Tension Washer	2
26	219791	Controller PCBA Runway Closure Marker	1
27	219966-S	Panel Engine Control with Function Switch Intertek Silkscreen	1
28	220634-P2	Hinge Control Box Door Flat Black	1
29	221537	Relay Solid State 40Amp 100VDC	1
30	221539-P2	Plate Cover Control Box with Relay Mount Flat Black	1
31	221728	Meter Hour 12VDC Digital	1
32	221735	Wire Kit Control Box Interior	1
33	211559	Relay 12VDC 35A	4
34	213989	Fuse Mini 32VDC 30A Green	2
35	104900	Fuse Mini 32VDC 10A Red	4
36	214388-C1	Photocell Assembly	1

7.11 Manual-winch assembly



Item	Part No	Description	Qty
1	101007	HAND-OPERATED WINCH, 1500-LB. CAP.	1
2	215906	WINCH HANDLE, 11"	1

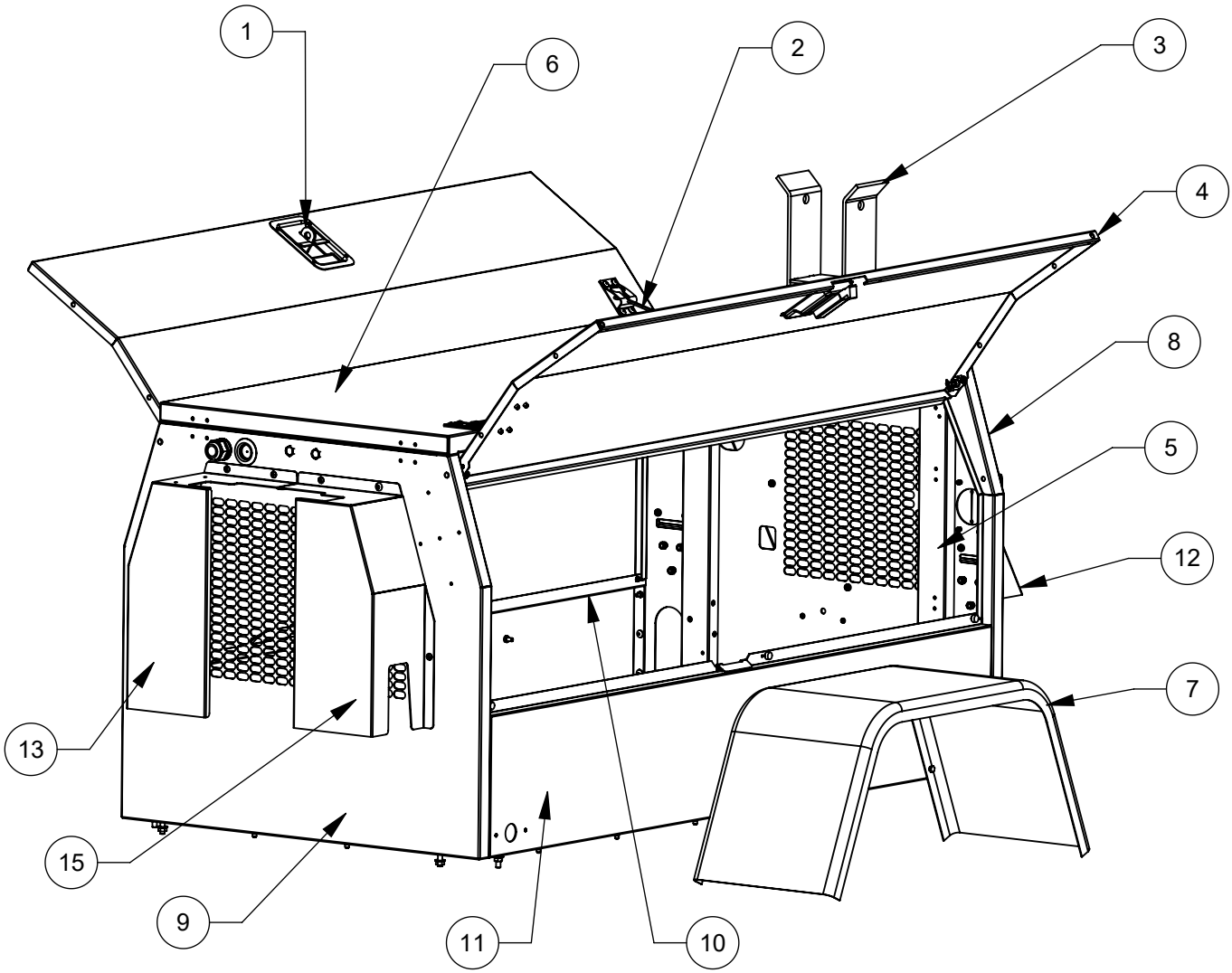
7.12 Drawbar assembly



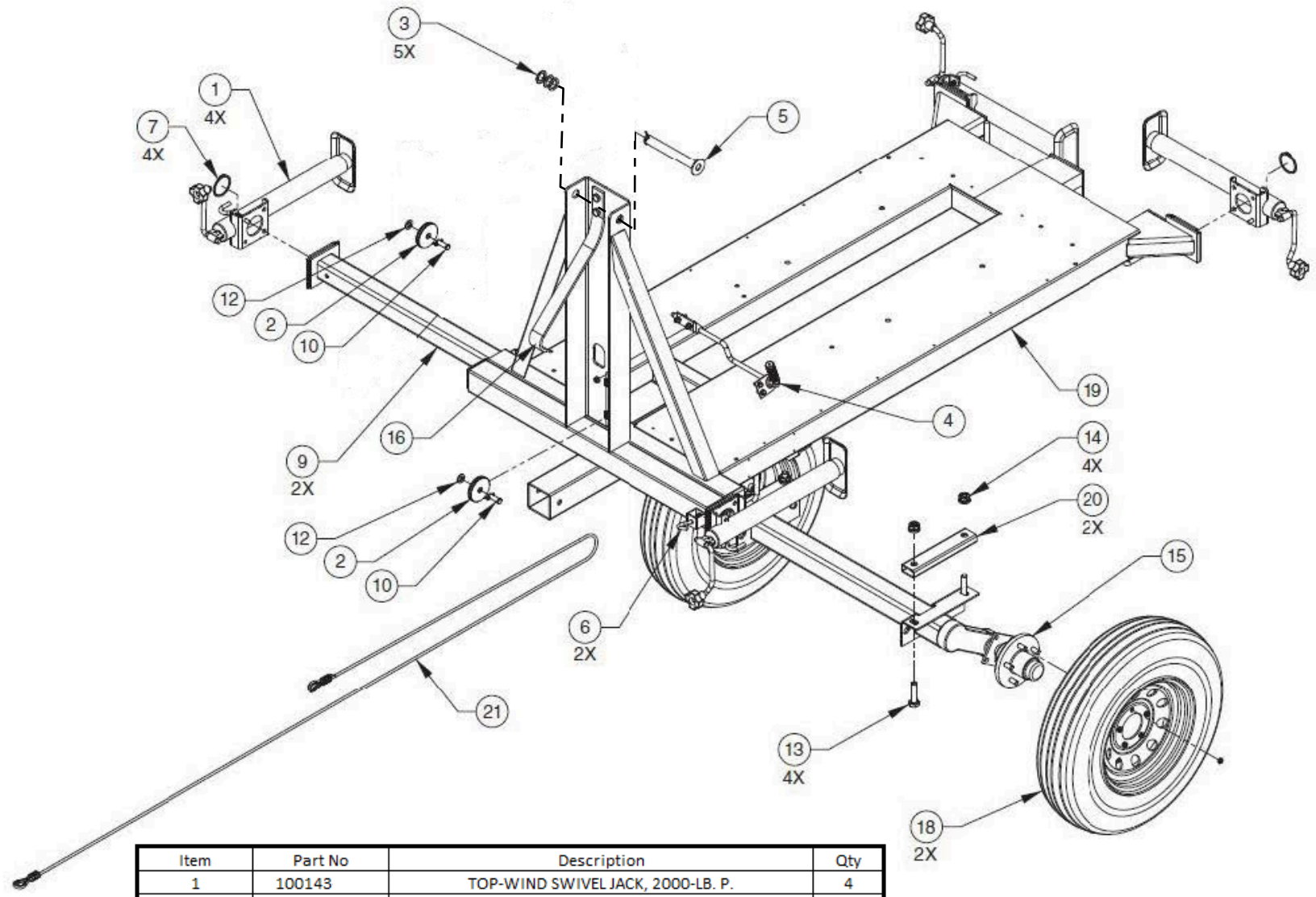
Item	Part No	Description	Qty
3	101677	TOW HITCH, 2" BALL	1
4	101933	SHORT SIDE-WIND SWIVEL JACK, 2000-LB. CAP.	1
5	215874	SWIVEL JACK SNAP RING, 2 1/2"	1
6	104859	TOW CHAIN WITH HOOK	2
7	105740-P2	COMBO-HITCH BRACKET, 2 1/2" EYE	1
8	201432	QUICK-LINK FOR TOW CHAIN	2
9	211136-P2	LIGHT TOWER DRAWBAR	1
10	215875	TAILLIGHT CABLE WITH FLAT-FOUR PLUG	1

7.13 Body assembly

Item	Part Number	Description	Qty	
1	219732	Latch Paddle Handle 30 Degree With Padlock Eye 5 1/2" x 4 1/4"	2	
2	104911	Holder Door LTC4	2	
3	220831-Z3	Cradle Welded Runway Closure Marker Tower Retention Plating B633 T3	1	
4	220194-P2	Panel Door Service Top Light Tower Flat Black	2	
5	200471-P2	Frame Panel Brace Support Tower Flat Black	1	
6	201203-P2	Panel Top Body Service Flat Black	1	
7	203751-P2	Fender Jeep Style 30" x 13" x 12" 16 Gauge Flat Black	2	**Use with Torsional Axle**
7	220238-P2	Fender Jeep Style 30" x 13" x 8" 16 Gauge Flat Black	2	**Use with Leaf Spring Axle**
8	209967-P2	Panel Rear Body Service Long Run Flat Black	1	
9	209968-P2	Panel Front Body Service Long Run Flat Black	1	
10	210335-P2	Panel Side Right Lower Body Service Long Run Flat Black	1	
11	210336-P2	Panel Side Right Lower Body Service Long Run Flat Black	1	
12	211212-P2	Panel Shroud Radiator Body Lower Long Run Flat Black	1	
13	211433-P2	Panel Side Left Shroud Intake Long Run Flat Black	1	
14	211383-P2	Panel Shroud Intake Side Right Flat Black	1	
15	211560	Cover Receptacle Dual Gang Weatherproof Gray	1	
16	212913	Gasket Receptacal Single Dual Gang EPDM	1	

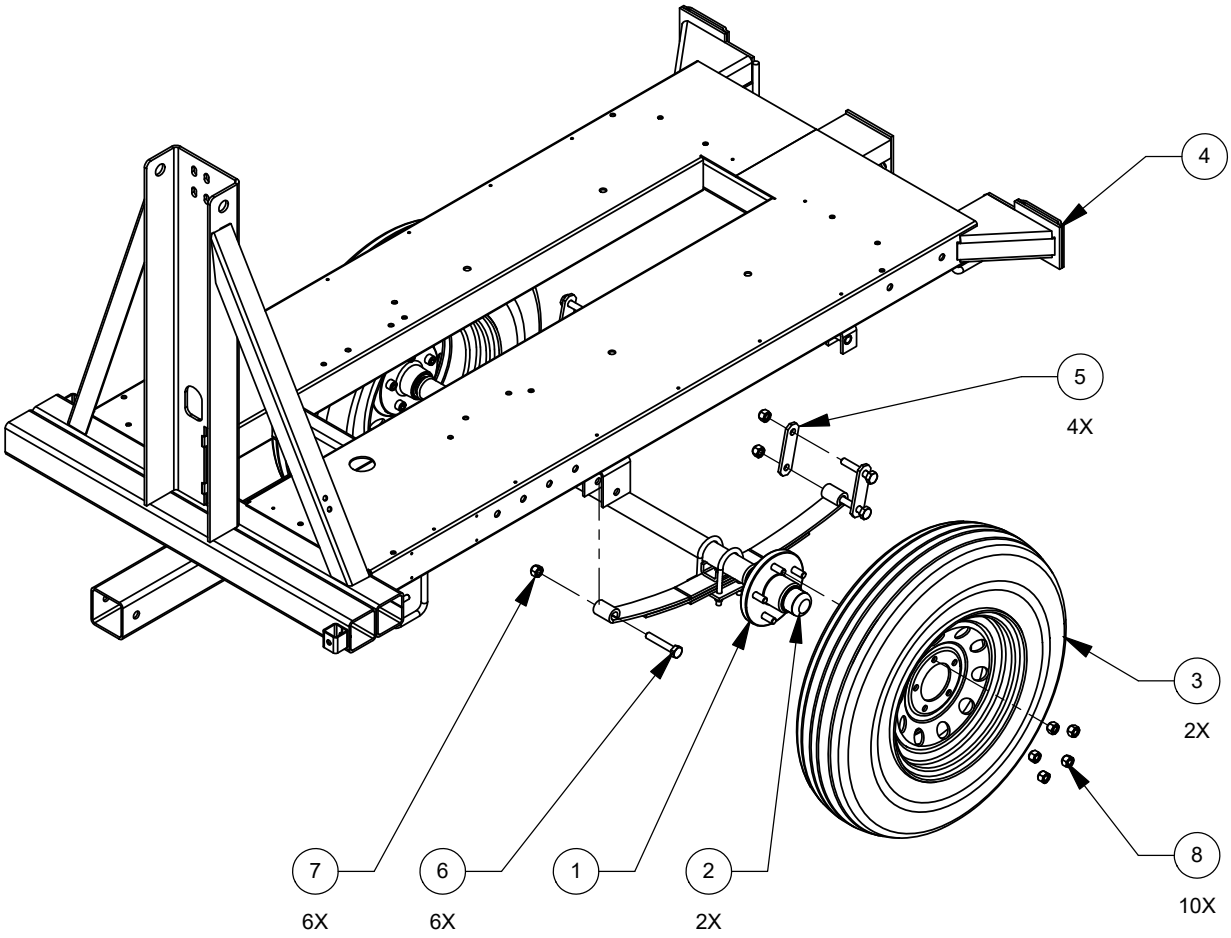


7.14 Frame assembly (torsional axle)



Item	Part No	Description	Qty
1	100143	TOP-WIND SWIVEL JACK, 2000-LB. P.	4
2	217093	PULLEY SINGLE GROOVE	2
3	100177	BUSHING, 1" X 1.5" X 0.068"	5
4	214533-C1	SPRING-LATCH ASSEMBLY	1
5	221646	PIN FOR SWIVEL BASE	1
6	101990	OUTRIGGER-LOCK PLUNGER ASSEMBLY	2
7	215874	SWIVEL JACK SNAP RING, 2 1/2"	4
9	105694	OUTRIGGER ASSEMBLY	2
10	205132	CLEVIS PIN	2
11	106006	FLAT WASHER, M14	2
12	108370	HEX SCREW, 5/8-11 X 2 3/4"	4
13	108372	TOPLOCK HEX NUT, 5/8-11	4
14	203171	AXLE ASSEMBLY, 2800-LB. CAP., 46 1/2" TRACK	1
15	205600	TOWER SPRING	1
16	205581	TRAILER TIRE WITH WHEEL, ST 185/80D-13	2
17	211210-P2	TRAILER FRAME	1
18	211478-P2	AXLE MOUNT	2
19	214210	MAST-TILT CABLE ASSEMBLY	1
20	211478-P2	AXLE MOUNT	2
21	214210	MAST CABLE	1

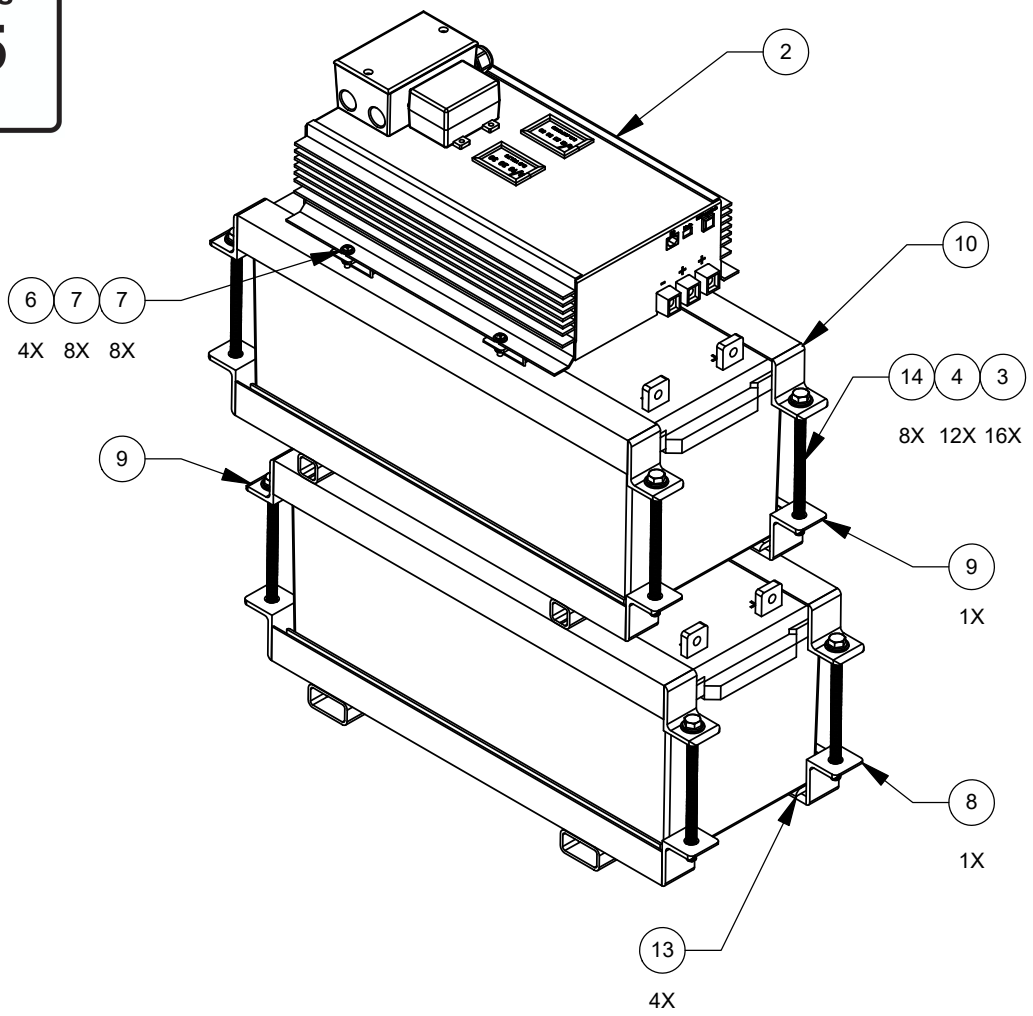
7.15 Leaf Spring Axle assembly



item	Part Number	Description	Qty
1	200101	Axle Sub-Assembly Leaf Spring 2200lb 41" Track 29" Spring Center	1
2	213434	Cap Grease Axle Leaf Spring 1.98OD	2
3	205581	Tire and Wheel Assembly Special Trailer Load Range D 13"	2
4	223563	Frame Trailer Leaf Spring Extended Deck	1
5	200108	Strap Shackle Axle Below 3500lb capacity Zinc Plated	4
6	200109	Screw Hex Suspension 9/16-18 x 3.000 Zinc	6
7	200110	Nut Lock Stover 9/16"-18 Zinc Plated	6
8	101323	Nut Wheel 1/2"-20 x 60ø Cone Zinc Plated	10

7.16 Battery stack assembly (AGM)

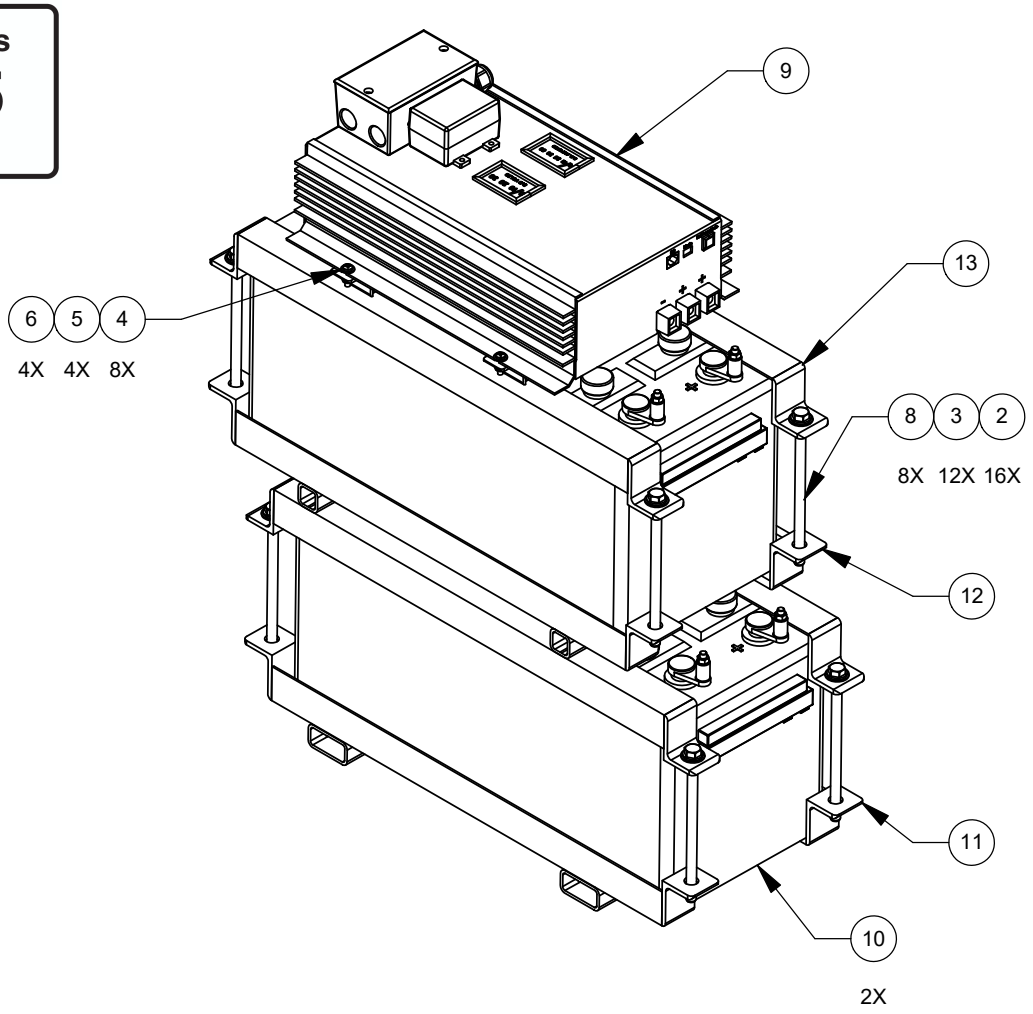
VA rating is
436.5
or higher



Item	Part Number	Description	Qty
1	205016	Battery 12V AGM UB4D 200AH	2
2	220842	Charger Assembly Runway Closure Marker Surge Protection	1
3	100234	Washer Flat SAE 3/8" x 7/8" x .05" 18-8 Stainless Steel	16
4	100723	Washer Regular Split 3/8" Plain Zinc	12
5	203685	Machine Screw Pan #10-32 x 3/4" Phillips 18-8 SS	4
6	101721	Nut Lock Nylon #10-32 Regular NE Plain Gr5 Zinc	4
7	101526	Washer Flat SAE #10 Plain Zinc	8
8	222930 -P2	Stack Battery Weldment Bottom	1
9	222931 -P2	Stack Battery Weldment Middle Offset	1
10	222932 -P2	Stack Battery Weldment Top Mount Charger	1
11	217637	Screw Hex 3/8"-16 x 1" x Full Plain Gr5 Zinc	4
12	100073	Nut Lock Nylon 3/8"-16 Regular NE Plain Gr5 Zinc	4
13	223566- P2	Angle Spacer Battery Stack AGM	4
14	223569	Screw Hex 3/8"-16 x 6" Full Thread SS	8

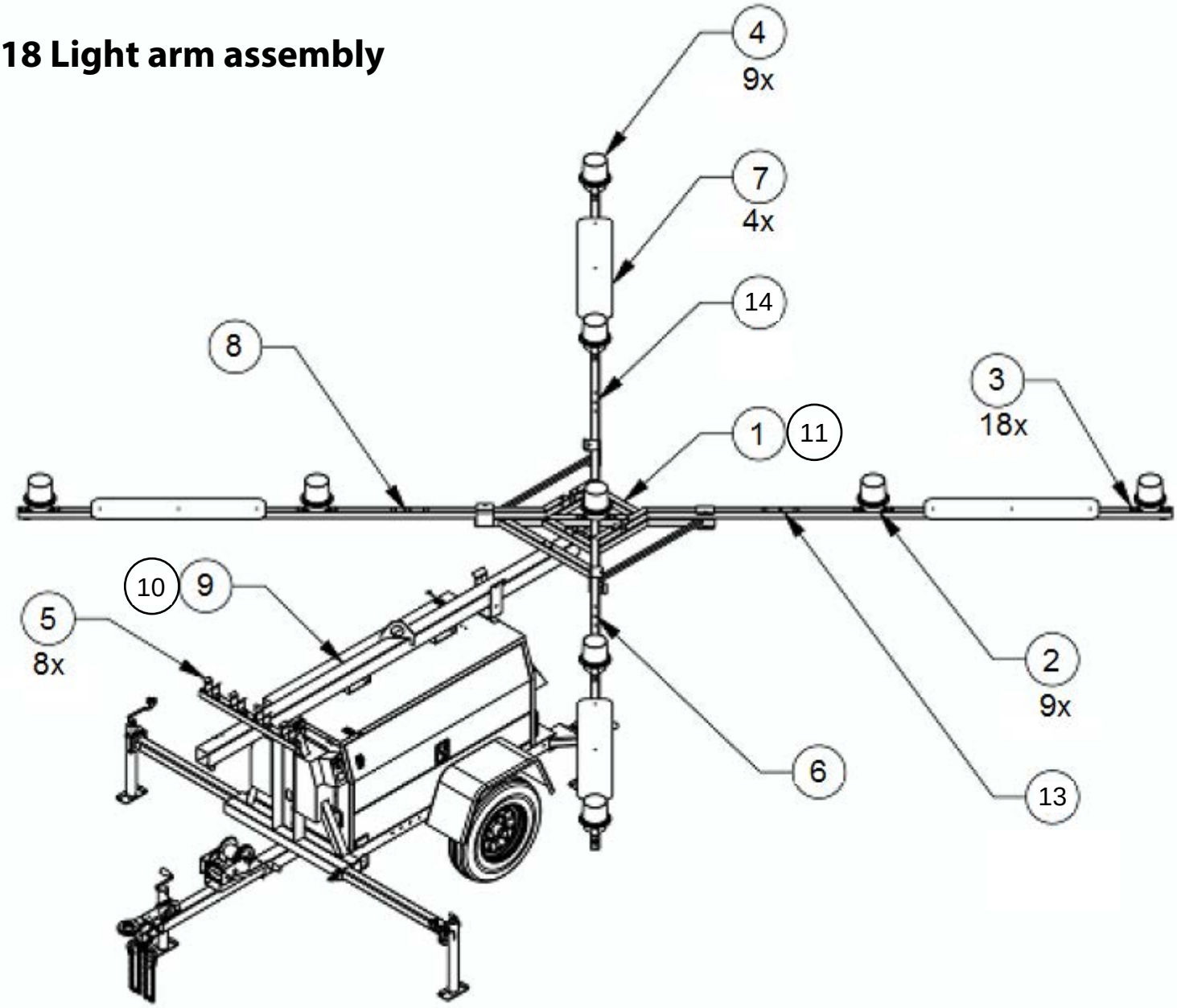
7.17 Battery stack assembly (Flooded)

VA rating is
436.5
or higher



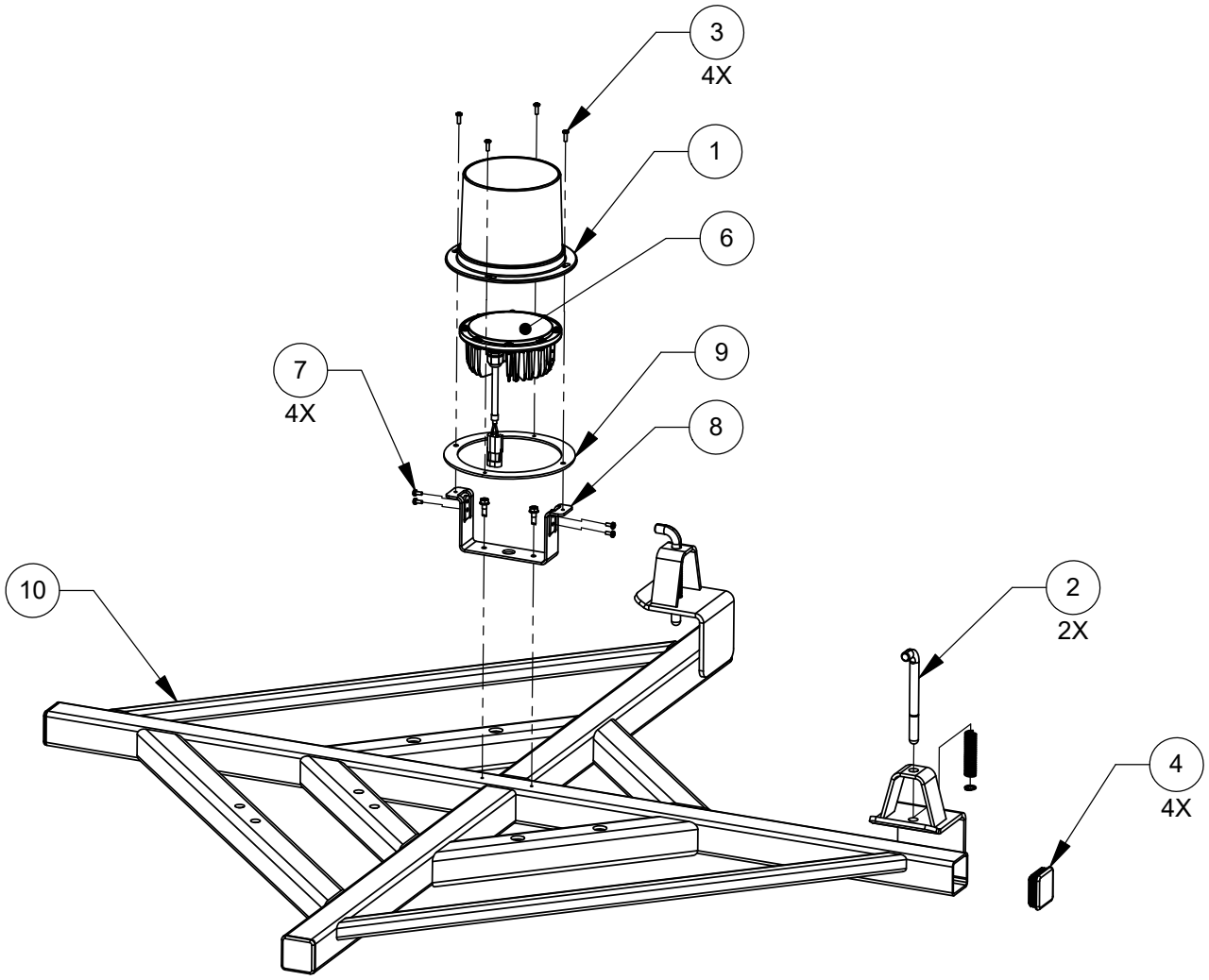
Item	Part Number	Description	Qty
1	100073	Nut Lock Nylon 3/8"-16 Regular NE Plain Gr5 Zinc	4
2	100234	Washer Flat SAE 3/8" x 7/8" x .05" 18-8 Stainless Steel	16
3	100723	Washer Regular Split 3/8" Plain Zinc	12
4	101526	Washer Flat SAE #10 Plain Zinc	8
5	101721	Nut Lock Nylon #10-32 Regular NE Plain Gr5 Zinc	4
6	203685	Machine Screw Pan #10-32 x 3/4" Phillips 18-8 SS	4
7	217637	Screw Hex 3/8"-16 x 1" x Full Plain Gr5 Zinc	4
8	217654	Screw Hex 3/8"-16 x 6 1/2" x 1" Plain Gr5 Zinc	8
9	220842	Charger Assembly Runway Closure Marker Surge Protection	1
10	221878	Battery 4D 12VDC Flooded	2
11	222930 -P2	Stack Battery Weldment Bottom	1
12	222931 -P2	Stack Battery Weldment Middle Offset	1
13	222932 -P2	Stack Battery Weldment Top Mount Charger	1

7.18 Light arm assembly



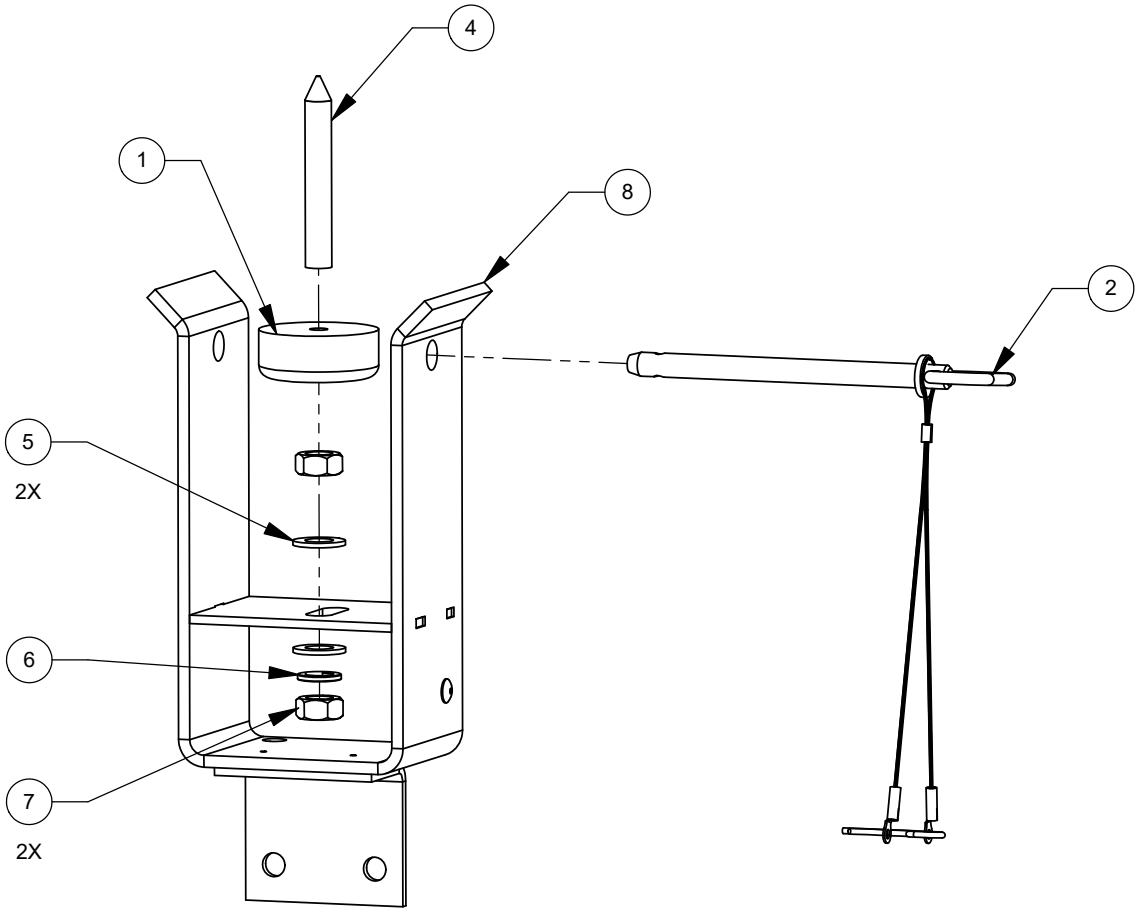
Item	Part No	Description	Qty
1	220246- P7	Frame Base Runway Closure Marker Yellow	1
2	218206	Light LED PAR46 White	9
3	219990-P7	Bracket Mounting Light PAR46 Yellow	9
4	100342	Visor Bulb PAR46 Large 5-1/2"	9
5	219940- P7	Bracket Retention Arm	8
6	220250- P7	Arm Runway Closure Marker 4:30 Position Yellow	1
7	219941- P7	Plate Wing Conspicuity Yellow	4
8	220253- P7	Arm Runway Closure Marker 7:30 Position Yellow	1
9	20358- P7	Mast Light Arm Mounting	1
10	220690	Arm Locking Pin	12
11	220303	Junction Box Assembly	1
12	220311	Mast Stop Bracket	1
13	220252- P7	Arm Runway Closure Marker 1:30 Position Yellow	1
14	220249- P7	Arm Runway Closure Marker 10:30 Position Yellow	1

7.19 Lamp and spring lock assembly



Item	Part Number	Description	Qty
1	100342	Large Arrowboard Visor PAR46	1
2	100394	Latch Hinge 1/2" Spring Pin Left Hand Zinc Chromate	2
3	102516	Screw Thread Cutting Pan 23 #8-32 x 1/2" Phillips Plain Gr5 Zinc	4
4	104311	Plug Square 2" x 2" 10-14 Gauge Wall Black Plastic	4
5	107154	Screw Hex #14-16 x 3/4" SDSM G5 Zinc Plated	2
6	218206	Light LED P46 24VDC 700mA 42W White	1
7	218463	Machine Screw Pan M4-0.7mm x 10mm Phillips Plain Zinc w/Spring Tension Washer	4
8	219990-P7	Bracket Mounting Light PAR46 Single	1
9	220007-P7	Plate Ring Shroud	1
10	220246-P7	Frame Base Runway Closure Marker	1

7.20 Horizontal cradle with locking pin



Item	Part Number	Description	Qty
1	102004	Bumper Rubber 2 1/2" x 1"	1
2	103830	Hitch Pin Assembly 1/2" x 5 3/4" with Lanyard & Hairpin	1
3	104605	Rivet Magna Lock 3/16" x 1/16" to 17/64" Steel	1
4	105621	Pin Chamfered M14 x 100mm Stainless Steel	1
5	106006	Washer Flat M14 A-2 SS	2
6	106103	Washer Regular Split M14 Plain Zinc	1
7	218990	Nut Hex Finished M14-2.00mm Plain Cl8 Zinc	2
8	220831-Z3	Cradle Welded Runway Closure Marker Tower Retention	1

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