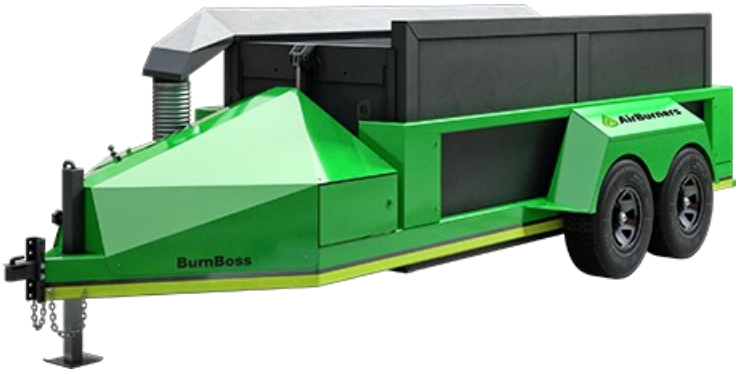
Operating Manual

BurnBoss® T24

Trailer Mounted Refractory Walled Air Curtain Burner

Equipped With Kubota Z482-E4 Diesel Engine



"Better Economically - Better Environmentally"

MADE IN THE USA

Factory and Main Office

Air Burners, Inc.
4390 SW Cargo Way
Palm City, FL 34990

Phone: 772-220-7303
888-566-3900
E-mail: support@airburners.com

Visit Our Website at

AirBurners.com

GSA

(Vers. 11.07.2023)

Caution

PLEASE READ ALL WARNING NOTICES BEFORE OPERATING THE BURNBOSS T24.

Caution

When towing the street-legal BurnBoss T24 on public roadways observe all rules and regulations of the competent authorities and travel at a safe speed. Ensure that the towing vehicle and its trailer hitch system are of the proper size and type to safely handle the BurnBoss trailer weight (GVWR) of approximately 10,000 lb. (4500 kg).

Make sure the towing vehicle is equipped with an appropriate brake controller for the self-adjusting electric brakes. See Page 8 for more information.

The firebox (burn chamber) of the BurnBoss T24 has no bottom and must be lowered onto level earthen ground (dirt) and never onto combustibles like dry grass or peat moss and the machine must also not be operated on a surface like a concrete pad, gravel, crushed stone or asphalt (See Page 5 for more details).

Contact Air Burners, Inc. should you require any assistance. Send Email to support@airburners.com, call 772-220-7303 or 888-566-3900 and ask for Customer Support.

INDEX

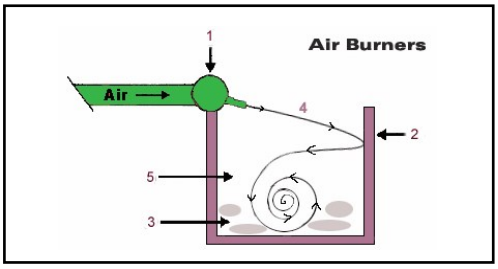
"BurnBoss" T24 Trailer Mounted FireBox

PRINCIPLE OF AIR CURTAIN INCINERATION

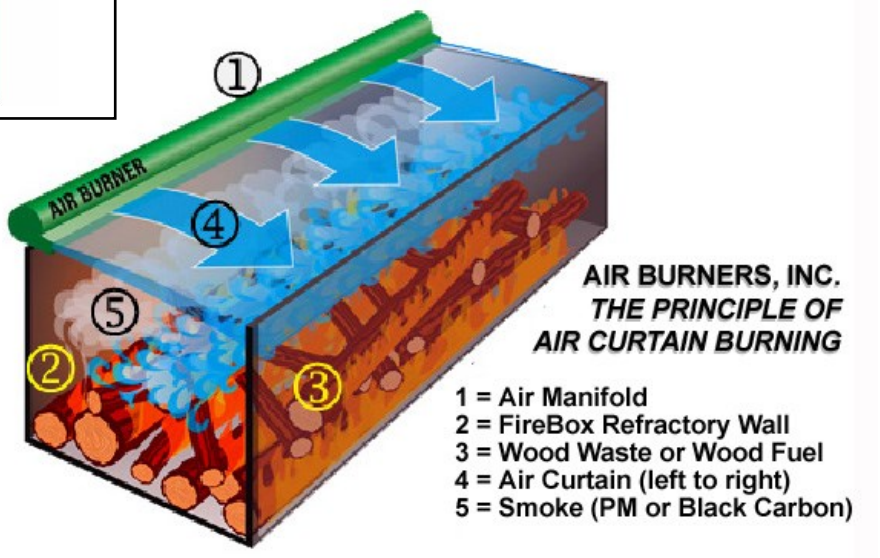
OPERATION

Air curtain burners are designed primarily as a pollution control device. Using a diesel engine driven fan, these machines generate a curtain of air with a very particular mass flow and velocity. This curtain of air acts as a trap over the top of an earthen trench or thermal ceramic lined firebox. The wood debris is dumped into the trench or firebox and then ignited (usually with a propane torch and with a small amount of diesel) just as you would light any other pile of wood you intended to burn.

Once the fire has gained strength, the air curtain is turned on. The air curtain traps most of the smoke particles and causes them to re-burn under the air curtain where the temperatures can exceed 1,800º F. These machines do not inject any fuels into the fire, the fire is sustained only by adding more wood debris. The air from the air curtain is not heated. The only fuel used in the continuous operation is that of the diesel engine driven fan.



Scan for video
“Open Pile Burning
vs FireBox Burning”



GENERAL DESCRIPTION OF BURNBOSS®

The BurnBoss design is intended to allow for the use of our self-contained refractory walled air curtain system design, but mounted on a trailer frame for ease of mobility.

The standard S-Series machines are offered in several sizes as indicated below. Most of the functions and principles for the BurnBoss are the same as the standard FireBox (S-Series). The T26 CharBoss is a trailer-mounted street-legal Biochar processor designed do optimize production of high-grade Biochar. The self-propelled T28 TrackBoss is similar to the T24 BurnBoss, however, with the trailer frame replaced by a remotely controlled track system.

Above-Ground Air Curtain Burner Dimensions					
Model	**Overall Size** L x W x H	**Firebox** L x W x H	**Weight** lbs.	**Fuel** gal/hr.	**Average Thru-put*** tons/hr.
S330	40' 4" x 11' 10" x 9' 6"	30' 2" x 8' 5" x 8' 1"	59,000	3.0	11-13
S327	37' 4" x 11' 10" x 9' 6"	27' 2" x 8' 5" x 8' 1"	54,600	3.0	9-11
S223	33' 3" x 8' 6" x 8' 6"	22’ 11” x 6’ 2” x 7’ 1"	40,250	2.0	7-9
S220	30' 1" x 8' 6" x 8' 6"	19’ 8” x 6’ 2” x 7’ 1"	36,650	2.0	5-7
S119	27' 3” x 7' 2" x 7' 4"	19 x 5’ x 6'	30,100	1.9	3-5
S119R**	27' 6” x 7' 2" x 8' 3"	19 x 5’ x 6'	39,900	1.9	3-5
S116	24 7”' x 7' 2" x 7' 4"	16' x 5’ x 6'	27,500	1.9	2-4
S116R**	24' 11” x 7' 2" x 8' 3"	16' x 5’ x 6'	36,300	1.9	2-4
T28	17' 10" × 8' 5" × 5' 8"	12' × 4' × 4'	15,350	1.1	½-1
T26	21’ 8" × 7' 8" × 6' 8"	12’ × 4' × 4'	17,500	1.1	½-1
T24	19' 8" × 7' 8" × 5' 8"	12' × 4' × 4'	9,980	0.56	½-1

* Approximate values. Achievable through-put depends on nature of waste stream and other factors.
** Cable-hoist version; Hook-lift version is 5” shorter

Standard FireBox S220

Roll-off FireBox S119R

GENERAL DESCRIPTION OF BURNBOSS

The BurnBoss is a proven design that adds mobility to the Air Burners S-Series FireBox line of machines. When delivered to a job site, the machine is ready for use as soon as it is off-loaded. The firebox system (burn chamber) is built on a patented trailer frame that allows the firebox to be raised and lowered for easy movement over the ground. The firebox is lined with proprietary thermal-ceramic refractory panels. The panels are cured prior to installation at the factory to drive out any moisture to ensure they are stable at first use in the field.

The forward equipment deck under the cowling supports a two cylinder diesel engine, a 10 gallon fuel tank, the direct drive system and the air fan. In addition, the battery and firebox hydraulic controls are located here. When viewed from the rear of the unit, the patented air disbursement manifold is mounted on the right top side of the combustion chamber.

The diesel engine is directly coupled to the air fan. The high velocity air is sent down the manifold through the vanes and directed to the outlet nozzles. A balanced and distributed air flow is directed across the top of the firebox (burn chamber) and then reflected down into the combustion zone.

The curtain of air acts as a top over the firebox, trapping a large percentage of the escaping particulate matter (smoke) and causing it to burn down even further under the curtain before finally escaping through the curtain as a hot gas. The air from the nozzles travels across the firebox creating the air curtain effect, then it reflects off the far side thermal-ceramic wall adding oxygen to the combustion zone helping to generate a hotter more complete fire. This additional agitation helps prevent the fire from starving for oxygen as the ash builds up during burning operations.

All of this is carefully engineered to provide the correct amount of air at the correct velocity. It is sometimes thought that more air flow will actually increase the burn rate. This is INCORRECT. Modifying the air flow will actually have the opposite effect and reduce the machine's throughput. Additionally, it will reduce the machine's ability to meet air quality minimum standards. There is a maximum rate at which wood can burn. Trying to exceed that rate by adding more air to an air curtain burner causes two major problems:

1. It will cool the fire reducing combustion efficiency creating more smoke (carbon dioxide and nitrogen enriched). This will begin a circular effect of further reducing the oxygen and further reducing combustion efficiency. The result is that your throughput drops and smoke increases.
2. Increasing the air flow beyond design standards will over pressurize the firebox causing significantly more particles (embers) to be ejected from the firebox. Besides violating the EPA limits for PM (particulate matter) the larger hotter embers ejected will pose a much greater fire hazard.

T24 BurnBoss in Full Operation

T24 BurnBoss - Trailer Mounted FireBox

SAFETY CONSIDERATIONS

READ ALL SECTIONS OF THIS MANUAL BEFORE YOU BEGIN BURNING OPERATIONS

The BurnBoss operator is dealing with fire on a daily basis; it is very important that each and every individual involved with the machine be alert and practice very rigid safety precautions.

When you are running the BurnBoss you are responsible for ensuring that it is operated in the safest possible manner at all times. If you notice something wrong, correct it immediately, and if you cannot correct it, find someone who can and/or shut down the machine.

Basic Safety Points:

1. The BurnBoss must be placed onto cleared, level ground.
   The BurnBoss should be driven onto level ground to facilitate loading, dumping and moving of the unit. When lowered, the firebox must touch the ground on all four sides or smoke and embers will escape.
2. The unit should be positioned such that no combustible material is stored within a minimum 100 ft. clearance in any direction.
   The firebox of the BurnBoss does not have a bottom and must not be located over combustibles such as dry grass or peat moss which may cause a fire to spread to other areas. It is equally important not to place the BurnBoss on anything other than earthen soil, never on a concrete pad, on gravel, crushed stones or asphalt. There is a good reason for this warning. Concrete or gravel can contain water which the heat in an operating BurnBoss could vaporize quicker than it can be drawn out. This could result in increased vapor pressure that can cause the concrete or stones to explode. Fragments could possibly fly out of the firebox and cause injury or death to persons nearby.
3. The unit should not be operated when the wind speeds reach 20 mph, as the potential to carry hot embers is significantly increased.
   As an operator you should always be aware of wind speed and direction. Increased wind speed will affect the integrity of the “air curtain” and will cause hot embers to travel farther. See the wind speed chart regarding suggested set-back on Page 6.

DANGER:
Watch for the danger notices throughout this manual.

4. NEVER use highly combustible materials to light the wood waste.
   Highly combustible materials such as gasoline, refined spirits, etc. ignite at an explosive rate which may cause serious injury or death. The safest method to start the fire in the firebox is to use materials such as kindling wood. In the absence of these materials or when starting materials with a high moisture content, use diesel fuel as an acceptable option.
5. NEVER climb onto the BurnBoss or lean over to view or light the fire.
   Always load and operate the machine from the MANIFOLD side.

   Hot embers will escape at a low height opposite the manifold. The left side of the machine (opposite the manifold) must be restricted access to prevent injury to persons.
6. Shut the BurnBoss down in an emergency.
   Stop loading the unit, stop the air flow by shutting down the engine. Dump dirt or sand onto the fire. Water should only be used as a last resort as it will likely damage the refractory panels.

DANGER:
Falling into the firebox will cause serious injury or death.
DO NOT stand within 20 feet of the BurnBoss on the side opposite the manifold.

WIND SPEED VS. SAFE DISTANCE			
Wind Speed mph	Approximate Safe Distance for:		
	Structures (Houses, etc.) ft.	Woods/Trees ft.	Stored Brush Piles ft.
10	300	150	100
12	300	150	100
14	300	200	150
16	400	250	150
18	400	250	200
20	500	250	200

DANGER: The above distances serve as a GUIDELINE ONLY! You MUST ALWAYS observe the down range area regardless of the wind speed. You must always observe local fire ordinances and directives from the local fire department or other competent authorities.

7. Personal Safety (Personal Protective Equipment – PPE)

Operators need to be aware of the following potential hazards:

a. Flying hot embers being released from the fire. Operators or anyone within the 100 ft. radius of the fire should wear appropriate fire resistant clothing. The ideal outerwear for an operator would include a Nomex jacket, leather gloves, eye protection, hard hat, cotton work jeans and steel toe boots. Operators should never wear synthetic material (i.e., polyester) around the fire as this type of material can melt and cause injury. Additionally, some synthetic materials will support combustion and could be very dangerous around fire. One hundred percent cotton materials would be the minimum, cotton treated with a fire retardant would be better and fire proof materials like Nomex would be best.

b. Noise: Ear protection is recommended around the BurnBoss. It is a good practice to wear approved ear protection when working in close proximity to the fan and engine.

c. Hot Panels: The backs of the thermo-ceramic panels and parts of the steel structure can each temperatures as high as 500ºF. Caution should be taken to ensure operator and visitors do not come in contact with these hot areas.

d. Ash and dust can be released during the operation and during cleaning. Operators should wear appropriate breathing masks (PPE, such as respirators) to protect themselves from inhaling the dust and ash.

DANGER: You must ensure combustible debris does not build up on the equipment. It must be keep clean at all times during operation to prevent a fire that would damage or destroy the engine and accessories.

HOW TO TRANSPORT THE MACHINE

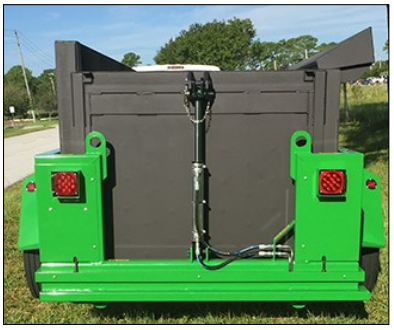
A. Towing BurnBoss T24

Towing the T24 BurnBoss is like towing any other “heavy” trailer. It is important that the frame rails are as level as possible when hooked to the truck. The T24 comes equipped with electric brakes, be sure your truck has an appropriate brake controller.

T24 models shipped from the Factory after September 1, 2021 are fitted with self-adjusting brakes. They are properly adjusted at the Factory, but it is the operator’s responsibility to keep them adjusted by periodically backing up the BurnBoss while applying the brakes hard.

The T24 is also fitted with a breakaway system. Make sure the battery is charged and the pig tail is properly connected to the towing vehicle, so that the brakes and lights will function and the breakaway battery be charged (Refer also to page 28). Be sure your hitch assembly is rated for the towing weight 9,983 lb. (4528kg) and tongue weight of 1200 lb. (544kg). A 2-5/16 in. (58.7 mm) trailer hitch ball is required.

Always maintain correct tire pressure to prevent premature wear and blow outs. Consult the tire decal inside the fuel tank access door. Though it is street-legal, should the need arise to move the BurnBoss a distance of more than 150 or 200 miles, it is recommended to transport it on a suitable trailer rather than towing it on roadways. This is not a requirement, but will reduce wear and tear. Always tow the BurnBoss at safe travel speeds.


T24 BurnBoss

TOWING AND TRUCK CONNECTION

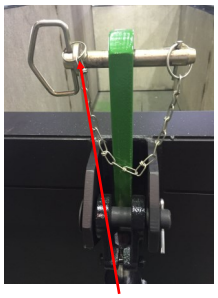
1. The BurnBoss lower trailer frame rail MUST be level to the ground when connected to the towing vehicle.
2. The electrical “pigtail” connection must be properly made. Check the electric brakes, break-away system and lights to make sure they operate properly.
3. The front jack stand must be up and secure.
4. Make sure the firebox travel safety pins in front and rear are properly in place and secured with their hitch pins for towing (See Page 10).
5. The safety chains and breakaway cable must be properly connected to the truck.
6. Test the brakes before you drive away.

DANGER: The BurnBoss lower trailer frame rail MUST be level to the ground when connected to the tow vehicle or significant accident and/or injury may occur. Always test the electric brakes before towing the BurnBoss to confirm that they operate properly. Back up periodically and apply the brakes to adjust them. They are self-adjusting. No manually adjustment is required.

HOW TO TRANSPORT THE MACHINE

B. LOWERING THE FIREBOX FOR USE

1. The firebox must be lowered onto level ground directly on dirt, not on any combustible, like dry grass or peatmoss and not on a concrete pad, gravel, crushed stone or asphalt.
2. The machine should be disconnected from the tow vehicle.
3. The front jack stand should be down and secure.
4. Use the tethered hydraulic control (inside left access door) to raise the firebox slightly to release the load on the travel safety pins.
5. Remove the travel safety pin at each end of the firebox. Store it as shown to right as to not misplace it.
6. Lower the firebox until it contacts the ground.
7. Important: Shovel dirt around the inside edges where the firebox contacts the ground to prevent heat and smoke from leaking out, especially behind the tires.
8. Wear Personal Protective Equipment (PPE).

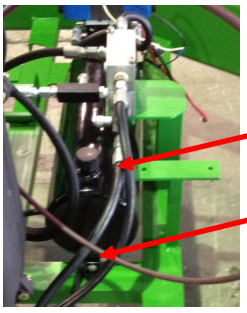


Travel Safety Pin stored with firebox lowered

<u>Hydraulic Oil</u>

If you are operating in cold weather you may need to warm the hydraulic oil before use. In most cases running the engine for 30 minutes will generate enough heat. If you still have difficulties operating the hydraulic system you will need to change the oil to a colder spec oil. Your machine's hydraulic system comes standard from the factory with Am Soil Synthetic hydraulic oil ISO32 (Am Soil P/N HVH05-EA).

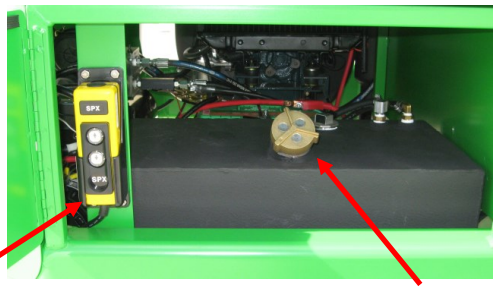
If your machine will operate in cold temperatures or remain outside for long periods in cold tempera-



Hydraulic Oil Tank (Fill)

Hydraulic Oil Tank (Drain)

Tethered Hydraulic Control

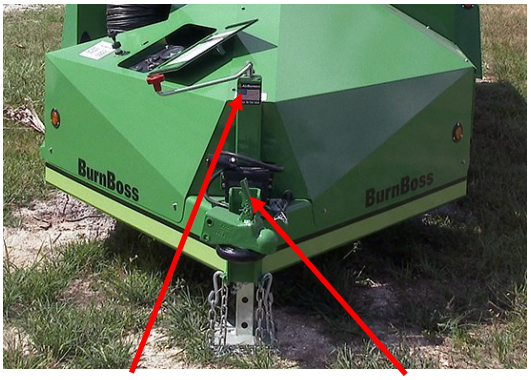


Diesel Fuel Fill

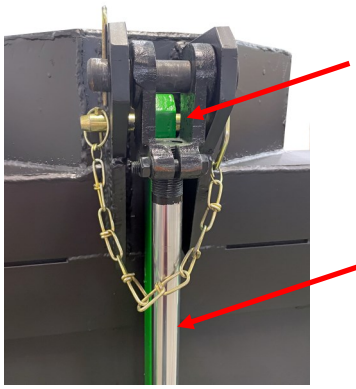
C. RAISING THE FIREBOX FOR TRANSPORT

1. Connect machine to tow vehicle.
2. Raise jack stand.
3. Raise the firebox until it stops.
4. **Immediately** move the machine forward if there are hot ashes in the firebox to prevent tire damage by hot embers.
5. Install both safety pins, front and rear.
6. Make all safety chain and electrical pigtail connections to towing vehicle.
7. Ensure you have read the section on “TOWING” (page 8) prior to moving the machine.

DANGER: If the FireBox contains hot ash then it must be moved immediately after it is raised to prevent damage to the tires.



Jack Stand Break-Away Unit



Travel Pin Installed

Hitch Pin Attached to Chain

DANGER: Do not tow the machine without both travel safety pins and hitch pins properly installed, as the hydraulic actuators may bleed down dropping the firebox on the road which may cause injury or death.

Adjustable Height Ball Hitch & Safety Chains

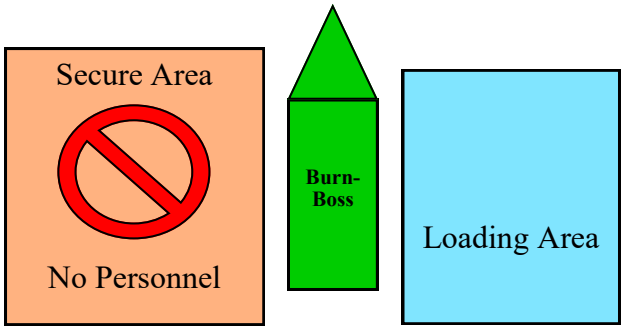
The T24 Ball Hitch Trailer Coupler in the adjustable Channel Mount Receiver shown to the left can be replaced with an optional Pintle Hitch (MIL Hitch) available from our Parts Department.

HOW TO SET UP THE MACHINE

A. POSITIONING THE UNIT

The BurnBoss unit is self-contained and ready to use upon delivery to the job site.

1. The BurnBoss must be setup on level ground.
2. The firebox is lowered to the ground using the hydraulic controls (see page 12).
3. The bottom edges of the firebox must touch the ground to ensure smoke and embers will not escape underneath the firebox walls. If necessary shovel some dirt into (INSIDE) the firebox to seal the edges. This must be done prior to loading the firebox. Add dirt around the bottom behind the tires to prevent any heat from damaging the tires.
4. With respect to the prevailing wind direction, the unit should be positioned such that the wind comes over the back of the manifold. This is the preferred position. It is also acceptable to have the wind blow into the manifold. It is discouraged, however, to have the wind come from either end of the machine, as this will tend to disrupt the air curtain.
5. The firebox will be loaded either by hand or by machine OVER THE MANIFOLD. The firebox should not be loaded opposite the manifold as there are many hot embers in this area making it dangerous for personnel.
6. Secure the area (orange safety cones, signs, fencing, etc.) opposite the manifold (20 ft. x 20 ft. - see diagram below) and along the side of the machine to ensure personnel do not get near the hot fire or embers.



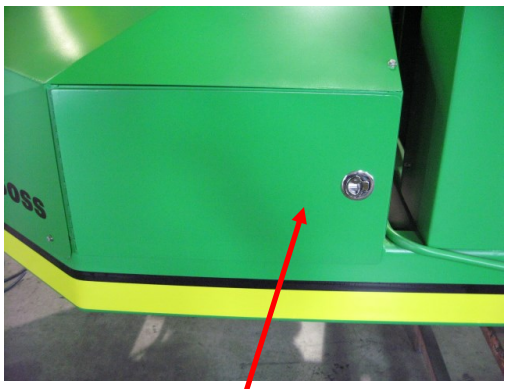
DANGER: Load the machine over the Manifold to prevent hot embers from endangering personnel.

B. PRE-OPERATION CHECKS:

1. Air filter for cleanliness (VERY IMPORTANT).
2. Engine oil level and hydraulic oil level.
3. Engine coolant level and antifreeze rating.
4. Diesel fuel level (Check fuel gauge).
5. Battery cable connections.
6. Check hydraulic lines.

DANGER: Never move the machine with the firebox down, this will cause significant damage to the machine.

Engine Controls

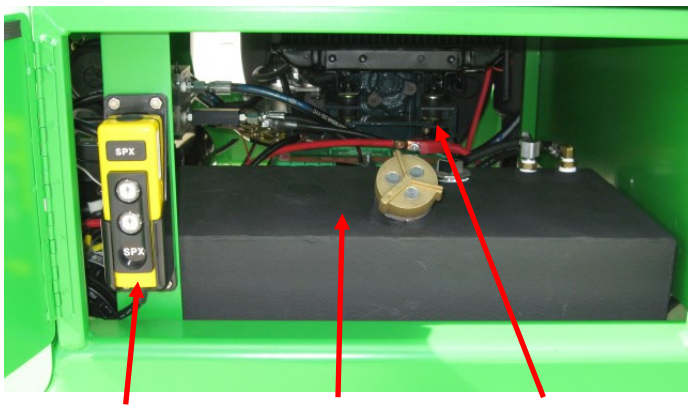

Access Cover for
Battery, Fuel Tank, Hydraulic Control

QR Code
For Operating Manual
& Servicing Information

Throttle

Engine Oil Check

Operating Instructions



Tethered
Hydraulic Control

Fuel Tank

Battery

HOW TO SET UP THE MACHINE

C. STARTING (Kubota Z482-E4)

1. Turn the speed control knob clockwise to ensure engine speed is at idle.
2. If needed, turn key switch counterclockwise to the PREHEAT position for not more than 5 seconds.
3. Turn the key switch clockwise to the RUN position.
4. The gauges will register to confirm that power is supplied to the panel.
5. Start the engine by turning the key switch all the way clockwise to “START”, then release key switch, and warm up the engine at idle speed of 1,000 RPM for 5 to 10 minutes.
6. Shut the engine down to prepare for loading and lighting (see pages 16-18 for loading and lighting instructions). **The fan is direct-drive, so leaving the engine running during lighting will make it more difficult to light.**
7. Once running, the engine speed may be varied as required by turning the speed control knob clockwise to decrease, counter clockwise to increase.
8. The maximum engine speed is governed to provide the correct amount of air flow.

Throttle Key Switch

Control Panel

SITE PREPARATION

THE GOALS TO GOOD SITE PREPARATION ARE:

To place the BurnBoss for easy access.
To sort the waste wood pile.
To organize the inflow of new wood waste.

When towing and positioning the BurnBoss at the burn site:

1. Consider where the waste piles will be located. We generally recommend two waste piles (explained in next Section).
2. Consider the predominate wind direction. Hot embers *will be* escaping from the firebox during all burning operations.
3. Consider clearances to empty the firebox. The unit must raised and towed ***forward*** until all the ash remains behind. When emptying, the tires cannot come in contact with the hot embers or they will be damaged. In most cases cold ash can be reapplied to the land. Check your local ordinances.
4. Once the BurnBoss is in position, it is important to place dirt around the inside bottom of the firebox where the thermal-ceramic panels meet the ground to “seal” the bottom. This will prevent smoke and heat from escaping. Pay particular attention to the seal between the tires and firebox and between the front wall and engine bay.

DANGER: Never dig a pit in the center of the firebox. This will allow high level heat to destroy the bottom of the T24 BurnBoss, voiding the warranty.

DANGER: Never operate the BurnBoss on combustibles like peat moss or dry grass, and never position it on a concrete pad, gravel, crushed stones or asphalt.

DANGER: This machine DOES NOT prevent hot embers from escaping. This machine is designed primarily as a pollution control device to reduce the smoke generated from open pile burning clean wood waste.

SITE PREPARATION

FASTER OPERATION THROUGH STAGING THE WOOD PILES

Air Burners air curtain burners were designed primarily as a pollution control device but operated correctly they will burn clean wood two or three times faster than open pile burning. To achieve the best throughput the fire must remain at the highest temperature possible. You achieve this by remembering three rules:

1. **Don't smother the fire with a huge load or a load of very dense material.**
2. **Load "less more often" smaller bucket loads more often.**
3. **Sort out a pile of your best burnable wood, use it to create a hot fire.**

The basic principle of operation is not too different from a campfire. You use your best wood to get it started and if the fire dies down you add some more "Good Wood" to bring it back up. The big difference is that on your campfire you are probably not adding root balls, leaves or pine needles. These are the high moisture content and dense materials that bring the fire temperature down.

The temperature drops (smoke increases) and your burn rate slows down, if you overload the machine with materials that have high moisture content such as tree branches with leaves and needles, or green branches such as palm fronds. While these are certainly ok to burn in the BurnBoss, you want to add them to a hot fire, so they dry out and ignite quickly.

To keep the temperature up and to maintain the highest throughput of waste, you should mix the very burnable wood with the less burnable materials throughout the course of the burning operation. The most common way to accomplish this is to stage a pile of the most burnable materials or what we call the "two pile system."

BurnBoss in Full Operation — No Visible Smoke

"If it's burning clean, it's burning hot, If there is smoke, you're losing money."

SITE PREPARATION

THE "TWO PILE SYSTEM"

For an efficient operation you would have two piles:

The **first pile** or "Main Debris" Pile, is the material being generated from the land clearing or forest clearing operation and is located away from the ember path but with good access to your loading machinery.

The **second pile** or "Good Wood" Pile is your best and most burnable wood. When you first setup the site the operator should spend some time sorting through the main debris pile pulling out what appears to be your best and most burnable materials. This is the material you will start the fire with, this is the material that will give you a good hot burning base fire. You will also draw from the "Good Wood" pile throughout the day if you should need to stoke up the fire (more on this in the following sections).

As the BurnBoss operator is drawing from the main debris pile throughout the day he should continue to replenish the "Good Wood" pile as necessary. The "Good Wood" pile only needs to be enough material to stoke-up the fire if needed and enough material to get you started the next day.

IMPORTANT WARNING ABOUT BURNING OF PALLETS

Wooden Pallets, especially spent pallets burn extremely hot. DO NOT load the BurnBoss above approximately 3/4 of the height of the firebox. Heat damage to the manifold and other structure may occur which would not be covered under your Limited Factory Warranty.

DANGER: You must ensure debris does not build up on the machine. It must be kept clean at all times during operation to prevent a fire that would damage or destroy the engine and accessories.

LOADING AND STARTING THE BURNBOSS

THE GOALS IN STARTING A BURNBOSS ARE:

\

To achieve an even fire across the length of the firebox.

To start the fire from the bottom of the initial pile.

To build a hot base fire.

There are two methods for lighting the unit; a cold start and a hot start. A cold start means the BurnBoss is clean and has no hot coals left from a previous burn. A hot start uses heat from the coals of the previous day's burn.

COLD START

1. BurnBoss must be on level ground.
2. The Engine should be off, (but as described on page 13, the engine should have been brought up to operating temperature).
3. Shovel dirt along the inside bottom edges of the panels to "seal" them. It will only need a couple inches to prevent the smoke from escaping underneath the unit.
4. Load the BurnBoss from the side of the air manifold. This is safer as there is less chance of the operator coming in contact with hot embers.
5. Load your most burnable material (materials from the "Good Wood" pile as discussed in the previous section) which is the smaller, dryer and cleaner wood, into the BurnBoss to a level of about half way up. Ensure the entire bottom area of the firebox is covered.
6. If you are using diesel fuel to assist in the lighting, spray it (approximately 3 gallons) across the top of this first load of woody feedstock.

DANGER: If you are using an accelerant (where permitted), first ensure there are NO HOT COALS remaining in the BurnBoss.

DANGER: DO NOT use highly volatile accelerants, such as gasoline or kerosene, to light the fire. These fluids ignite almost explosively and may cause injury or death.

LOADING AND STARTING THE BURNBOSS

7. Once you have this smaller material loaded and your accelerant added (if used) load some larger heavier material on top, such as logs or big branches. Load these heavier materials, also from your “Good Wood” pile, to a height just below the manifold nozzles. This heavier material will help compress the smaller feedstock which will give you a better light-off. If there are large air spaces between the materials in the firebox, the heat will not build up as quickly and the fire may be more difficult to light.
8. This material, once burning, will become your hot base fire to support continued burning. Use your best and driest materials (“Good Wood”) for startup, as this will form a strong base for continued burning plus it will start quicker and burn hotter. If you will be burning stumps then it is best to load them after the first hour of burning when the fire is up to full temperature.
9. The level of material in the firebox for light-off should be kept just below the manifold nozzles.
10. Using an appropriate method, such as a propane torch (like a weed burner) or oil soaked rags on poles to light the fire.
11. Once the fire is burning start the engine. Do not increase the engine speed too fast as the air from the manifold could “blow-out” your fire.
12. There is always smoke on start-up, as *all* of the material in the firebox contains moisture, compared to later in the burn operation, when only the new material you are loading contains moisture. Plus, the air curtain cannot be fully engaged, until the fire has strengthened or you run the risk of blowing out the fire.
13. Do not load new material into the BurnBoss too fast during the first hour of burning operations until a good hot base has been achieved.
14. Once a good hot fire base is achieved load new material at a rate that causes good ignition and does not “smother” the fire.

“Less material, more often, will give you the fastest burn rate.”

LOADING AND STARTING THE BURNBOSS

HOT START

A hot start uses the coals from the previous days burning operation. Depending on how much ash is in the unit, a hot start can usually be done only once before the unit will need to be emptied. The more ash in the BurnBoss that you start with the LESS room you have for burning new materials. Hot starting may not be practical for the BurnBoss due to its smaller size compared to S-Series Fire-Box Systems.

First, ensure there are enough coals remaining to generate enough heat to get the new waste materials burning. You CANNOT add an accelerant, if the waste materials do not light, as that would be too dangerous. If the material does not light, the BurnBoss must be emptied before trying a cold start with the use of an accelerant.

.

DANGER: Do not use an accelerant for a Hot Start, as it may ignite unexpectedly and cause injury or death.

HOT START LIGHTING

Similarly to a cold start you begin with your best and most burnable materials.

1. Load the BurnBoss to about one third or half way with the “Good Wood”. The wood should begin burning as soon as you start loading.
2. Start the engine and run at approximately 1400 RPM. This should help fan the flames and spread the fire. If you experience heavy smoke then reduce the RPM’s. Be cautious not to “blow out” the fire.
3. As the fire begins to heat up, increase the RPM’s.

DANGER:
Do not step or climb on any part of the Burn Boss.
Falling into the firebox will cause serious injury or death.

HOW TO FEED A FIRE

It will generally take 30 minutes for the fire to build to a point where the temperatures are sufficient for the unit to be operating with minimal smoke.

1. Add material from your “Good Wood” pile slowly for the first hour. It takes about an hour for the fire to reach minimum temperature. Your goal is to achieve an even and hot fire across the unit.

2. For continuous operation the engine RPM is run at full throttle (preset at the factory). If the fire is burning very hot with no smoke the RPM can be reduced by 1000 RPM to save fuel but that is very dependent on the waste material.

3. If you get excessive smoke and ash when you load the wood waste while dropping the load through the air curtain, then you may need to turn the RPM’s down temporarily as you load. This is most likely earlier in the burn operation.

4. Take caution when loading the unit that the material to be burned is not “dumped” in the firebox too quickly causing hot embers to be thrown from the unit. If you have an area in the firebox that is smoking, this indicates the temperature is low in that area. Add material from the “Good Wood” pile to get the fire temperature up. Once that area is burning add some of the heavier material.

5. The rate at which you load the unit varies depending on moisture content of the materials and the temperature of the fire. If you overload the firebox you will notice an increase in white smoke. White smoke is an indication that the temperature is dropping. If the smoke increases stop loading until the fire has caught-up. You can also bring the temperature up by adding materials from the “Good Wood” pile.

6. For the highest throughput load “*LESS MORE OFTEN.”* Smaller bucket loads more often will give the materials a better chance to ignite and will result in your highest throughput of material. Oversized bucket loads may smother the fire for a short period before it ignites this will slow the burning down and reduce your daily throughput.

7. The load in the firebox should not go higher than the bottom of the manifold. If the material is piled higher, it will begin to break the air curtain and more smoke will escape.

8. The fire should be loaded continuously throughout the day, in order to maintain operating temperatures. If the fire is not loaded continuously, the temperature will drop, the through-put will go down and more smoke will escape.

“If it’s burning clean, it’s burning hot, If there is smoke, you’re losing money.”

SHUTDOWN

HOW TO BURN FIRE DOWN FOR SHUTDOWN

All loading should stop one or two hours before you intend to put the fire out.

As the fire burns down, maintain the air speed until the firebox begins to smoke. As the smoke increases, reduce the air speed in increments of about 300 RPM. This will help to reduce the smoke.

The air in the manifold needs air flow, both to accelerate the burn down and to protect the manifold from warping due to excessive heat. **DO NOT shut off the air flow while there is still flames within 12 inches of the manifold.** Doing so may cause elevated temperatures to warp the manifold, nozzle assembly, etc. Your warranty does NOT cover damage due to excessive heat.

Once the fire has burned down to about one or two feet and flames are not visible near the manifold, it will be safe to shut the engine and air down. Make sure the fire is extinguished before you leave the job site. The best way is to load dirt or sand into the firebox, **but do not spray the refractory walls with water as this will damage them.**

When the burning materials in the BurnBoss have burnt down to ash, reduce engine RPM's to 900 RPM. Move the key switch counterclockwise to the OFF position to shut down the engine.

Most local authorities allow the BurnBoss to be secured and the embers to smolder all night. There is generally no smoke from this smoldering. Ensure the work site is secured or has a constant security guard to prevent any people or animals from getting near the BurnBoss. The inside temperatures of the BurnBoss will remain very high most of the night.

If you are not allowed to smolder through the night, then verify the fire inside is completely out. If it is still burning or smoldering you can raise the firebox and pull the trailer forward allowing the embers to remain behind. Then water down the embers. Ensure the fire is out and the job site secure before you leave.

DANGER:
Do not climb on any part of the Burn Boss.
Falling into the firebox will cause serious injury or death.

ASH REMOVAL

HOW TO EMPTY THE BURNBOSS

We recommend removing the ash every morning before burning operations begin. This will give you maximum capacity in the firebox and the ash will be easier to handle.

The BurnBoss will operate with up to 1½ ft. of ash inside, but as the ash gets deeper the efficiency of the unit goes down. One and half feet of ash would represent approximately 35% of the firebox capacity that would be unusable.

The ash is emptied by raising the firebox and towing the machine forward. It is important to tow the machine away from the embers as soon as it is raise to prevent hot embers form damaging wheels, tires and axles. The machine should be towed forwards as the tires cannot be driven through the hot embers.

DANGER: When removing ash from the BurnBoss, be aware of the wind direction and ensure all operators wear appropriate face masks (PPE) to prevent inhaling the ash.

Ash Removal

1. Turn off Engine.
2. Connect tow vehicle.
3. Raise jack stand.
4. Raise firebox into full up position and IMMEDIATELY pull forward leaving the hot embers and ash behind.
5. Ensure the ash pile is not left HOT, use water to ensure all fire is out.
6. Ash can be land applied or loaded in a dumpster for removal.

DANGER: When removing ash from the BurnBoss, move the machine as soon as the firebox is raised to prevent the hot embers from damaging the wheels, tires and axles.

TROUBLESHOOTING

1. **Fire will not start.**

   Material in fire firebox has too much air space. To correct, load heavy material such as stumps to make the lower material pack down. Use torches and light from the bottom, so the fire burns up.

2. **Fire burning at one end.**

   Load heavy materials directly on top of the burning area. This causes the flames to fan out in an effort to reach the top of the pile. As the fire begins to spread, keep material piled on top of the flames until the entire firebox is burning.

3. **Fire smoking too much.**

   The most common reason for a smoking fire is too much dirt or dense materials going into the firebox and reducing the heat. You must make sure the wood waste material is free from large amounts of dirt. Load from your “Good Wood” pile to bring the temperature back up

   You may have overloaded the firebox or loaded the firebox too fast. Example; if you only have 1 ton of material burning you can not load in 3 tons of material. The new material will smother the fire. Stop loading and let the fire catch up. The material you are loading may have a very high moisture content. You can either load at a slower rate or mix the wetter material with dryer material.

   If you are letting the fire burn down or the load in the firebox is less than 3 ft. deep you may need to turn the air down by reducing the engine RPM.

4. **Smoke from one area of the firebox.**

   The area is probably not burning well. Add smaller material from your “Good Wood” pile to this area to help build the fire. As the smoke clears add heavier material.

5. **Smoke from under the base rails or bottom of panels.**

   Loose dirt was not properly shoveled around inside of firebox to seal between panel bottoms and the ground. To fix this, shovel dirt around the outside where the smoke is escaping. Once the ash inside builds up this will stop.

MAINTENANCE, CARE AND SAFETY CHECKS

1. **Daily Check List:**
   a. Oil level (top off as needed).
   b. Engine coolant level (top off as needed).
   c. Diesel fuel level in fuel tank.
   d. Tap dirt out of air intake housing and check for excessive dirt.
   e. Clean out any debris under engine cowling and wheel fenders.
   f. Ensure the hydraulics are in proper condition, no leaks.

DANGER: Ensure there is no build-up of debris under the engine cowling or wheel fenders as this will create a fire hazard that could destroy your machine and cause bodily injury.

2. **Periodic Maintenance and Check List Before Hauling BurnBoss Trailer**
   a. Change engine oil and oil filter.
   b. Clean/replace fuel filter as needed.
   c. Clean and inspect air filter and replace as needed.
   d. Grease axles as shown on Page 24.
   e. Check bolts and set screws to ensure they are tight.
   f. Clean debris off radiator.
   g. Check alternator V-belt and adjust as needed.
   h. Check hydraulic system for leaks and sufficient fluid in reservoir.
   i. Check wheel lug nuts and tires for condition and set pressure at 105 psi (cold).
   j. Back up BurnBoss and apply the brakes hard so that they will self-adjust.
   k. Check break-away battery and steel cable.
   l. Check trailer hitch and safety chains.
   m. Check trailer brakes and all trailer lights.
   n. Ensure that the hitch pins with chains that are part of the actuator travel safety pins are in place and properly installed.

Contact Air Burners, Inc., should you require assistance with any of these necessary maintenance tasks. Send Email to support@airburners.com, call 772-220-7303 or 888-566-3900 (Customer Support)

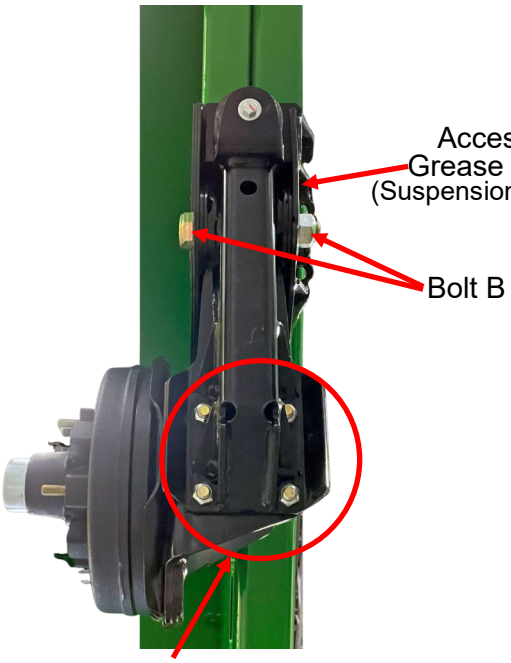
Consult the supplied Kubota Engine Service Manual.

MAINTENANCE, CARE AND SAFETY CHECKS

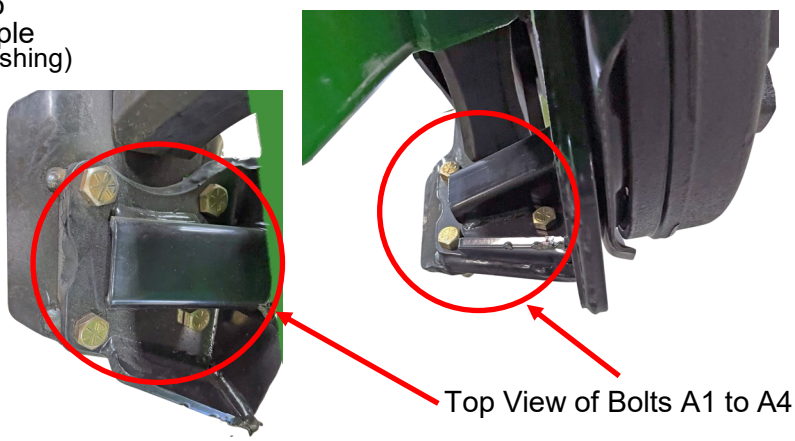
1. FIRST WEEK OF OPERATION CHECK LIST: AXLE MAINTENANCE

This maintenance work requires that the trailer be chocked for safety, raised and supported by suitable jacks placed under the frame to a height that will relax the torsion springs and removal of each wheel. The firebox must be raised and the travel safety pinsproperly in place. This will allow access to the four (4) Bolts A and the large Bolt B. Hold the Bolts A topside with a wrench and tighten the bottom nut by torque wrench. See also NOTE below. Upon reinstallation of the wheels, torque the lug nuts to 80 ft-lb (109 N·m).

a. Retorque the four (4) outboard arm (spindle) Bolts A to 155-165 ft-lb. (210-224 N·m).
b. Retorque control arm pivot bolt B to 430-470 ft-lb. (583-638 N·m).
c. Grease suspension bushing and wheel bearing every 6 months (off road use) or every 12,000 miles.



Bottom View of Bolts A
(Nuts Shown)
and Grease Nipple Access



NOTE:
On T24 models manufactured after May 1, 2023, the A bolts & nuts have been reversed. The bolts are inserted from the bottom and the nut placed on top,

Check the proper torque of the Bolts A (1-4) and B and the wheel lugs periodically, especially before longer roadway travels. Grease the suspension bushing and wheel bearings with grease gun at the location indicated above. Rotate wheel by hand as grease is applied to bearing until old grease is visible. See Page 27 for lubricant grade.

THERMAL-CERAMIC PATCHING COMPOUND

THERMAL-CERAMIC WET PRE-MIX PART # 6900-1003

For minor repair of Air Burners BurnBoss refractory panels.

Directions:

1. Cracking of the panels is normal as they flex in the heat. Filling the cracks every 6 months or as needed will extend the life of your Thermo-ceramic Panels.

2. Air Burners patching compound is pre-mixed and ready to use (may require some stirring).

3. Storage: Compound should be stored indoors in a frost free location.

4. Preparation: The area in and around the damaged area to be patched must be cleaned and brushed to provide the best surface for the compound to adhere. Remove all loose refractory and debris from the area to be patched.

5. Wet the cleaned surface with a light spray or damp cloth.

6. Installation: Using a trowel or similar tool, pack the refractory compound material into cracks and into areas where the refractory is missing. o achieve proper thickness trim off the excess material using a sharp flat blade or the side of the trowel.

7. Allow the material to harden overnight before placing the FireBox back into service. After the compound has hardened operate the FireBox under normal conditions.

NOTE:
This is an air cured product. Reseal unused portion immediately.
Once opened the shelf life is one (1) year.

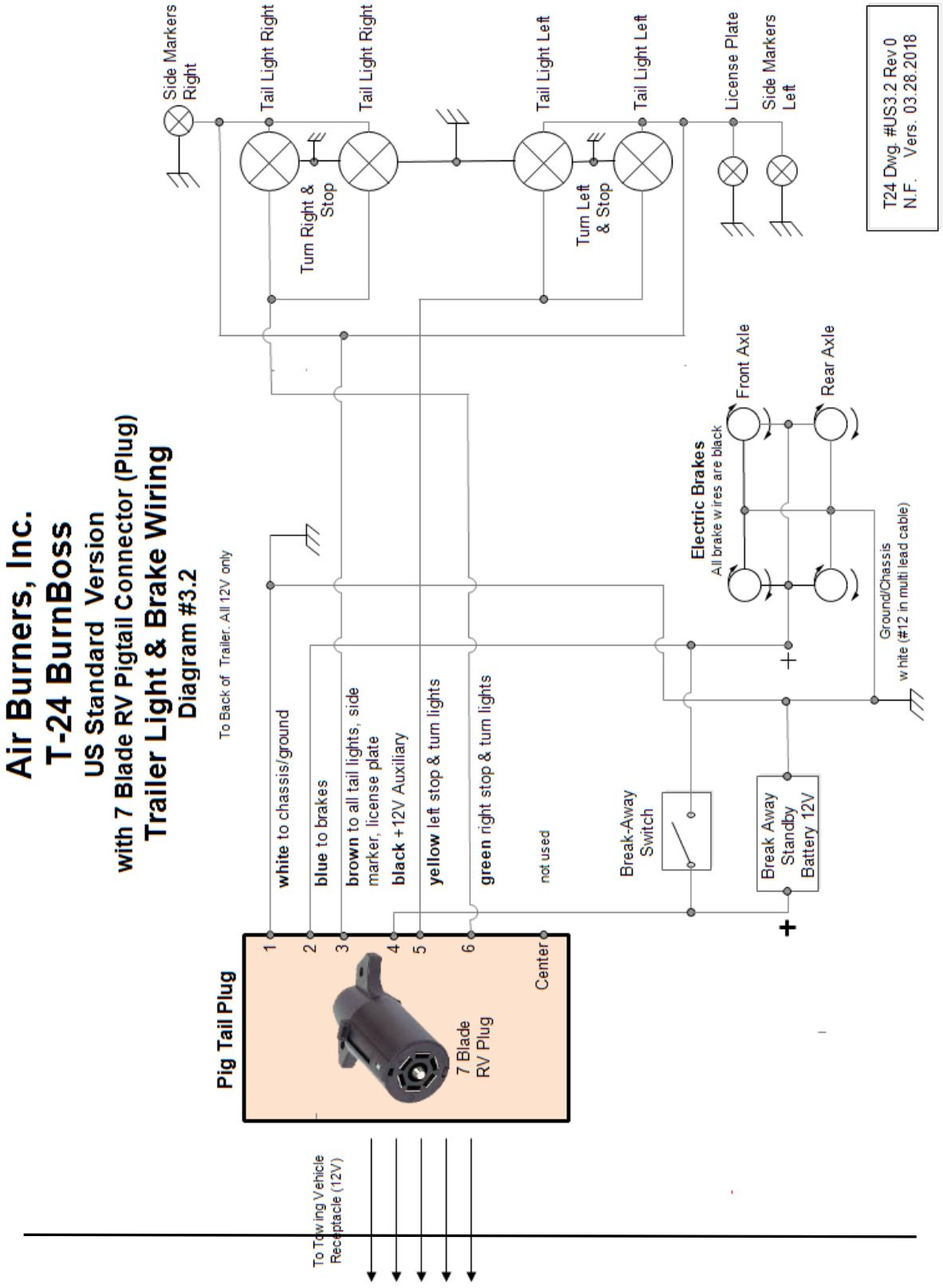
SERVICING SPECIFICATIONS

Parts List for Routine Service of Kubota Industrial Diesel Engine Z482-E4

Also Refer to Engine Manufacturer's Service Manual for Engine Service Details
(Engine should be serviced after first 50 hours, then every 100 hours of operation)

Description	Air Burners P/N	Manufacturer's P/N	Service Interval
Air Cleaner Element	3060-1022	Kubota 1G659-11222	1 Year or as needed
Oil Filter	3060-1020	Kubota HH150-32430	200 Hours
Fuel Water Separator Element	5000-2462	Kubota 1T021-43560	200 Hours or as needed
In-line Fuel Filter	5000-2463	Kubota 12581-43012	200 Hours or as needed
V-Belt (Engine)	3060-1023	Kubota 15881-97010	200 Hours or as needed
Electrical System Fuse 40A Automotive ATC Blade Fuse	5000-1987	NAPA BK7822022	As needed
Battery, 12V, Max 120 Ah; Max. CCA 800; Min. CCA 750; RC 130	5000-2472	Interstate Batteries 24M-XHD	2 Years or as needed

Tire Pressure	105 psi (724 kPa) Cold
Tire Size	ST235/80R16
Rim	16 x 6 (8 Lugs)
Engine Oil	15W40 Diesel Grade
Engine Oil Capacity	2.6 qt. (2.5 L)
Bearing Lubricant	NLGI Grade 2
Engine Coolant	Low Silicon Anti-Freeze (Green). Units are shipped from factory with 50-50 mixture green antifreeze/water.
Hydraulic Oil	ISO32 Synthetic Hydraulic oil, factory installed is Amsoil HVH05-EA. (cold weather option is ISO22 synthetic, i.e. Amsoil HVG05EA). Capacity is approximately 2.16 gal. (8.19 L). Change Hydraulic Oil every 1 to 2 years, depending on environment.
Break-Away Switch	12V Battery - See Owner's Manual
Fuel Tank Capacity	Minimum 10 gal. (37.8 L)


Air Burners, Inc.
T-24 BurnBoss
US Standard Version
with 7 Blade RV Pigtail Connector (Plug)
Trailer Light & Brake Wiring
Diagram #3.2
T24 Dwg. #US3.2 Rev 0
N.F. Vers. 03.28.2018
Side Markers Right
Tail Light Right
Tail Light Right
Turn Right & Stop
Tail Light Left
Tail Light Left
Turn Left & Stop
License Plate
Side Markers Left
Front Axle
Rear Axle
Electric Brakes
All brake wires are black
Ground/Chassis
white (#12 in multi lead cable)
To Back of Trailer. All 12V only
white to chassis/ground
blue to brakes
brown to all tail lights, side marker, license plate
black +12V Auxiliary
yellow left stop & turn lights
green right stop & turn lights
not used
Break-Away Switch
Break Away Standby Battery 12V
+
Pig Tail Plug
1
2
3
4
5
6
Center
7 Blade RV Plug
To Towing Vehicle Receptacle (12V)

AirBurners

7-Blade RV Type Trailer Wiring Connector

(Looking from Screw Connector Side - Back of Plug)

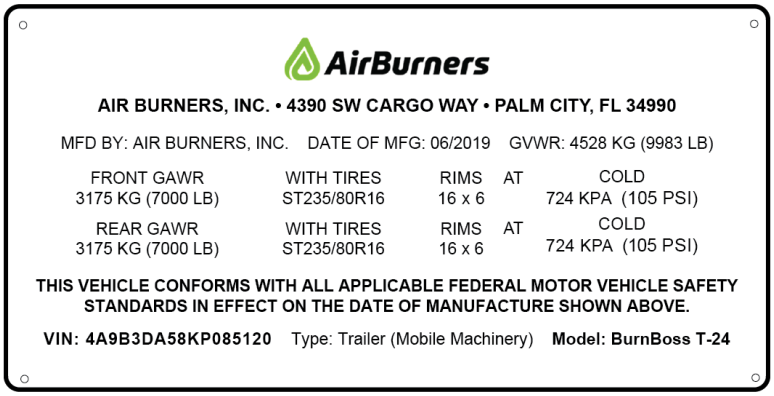
Blade #4 Connects to Break-Away Switch to Supply +Power from Towing Vehicle

Applies to Air Burners Models T26 (Special VIN)

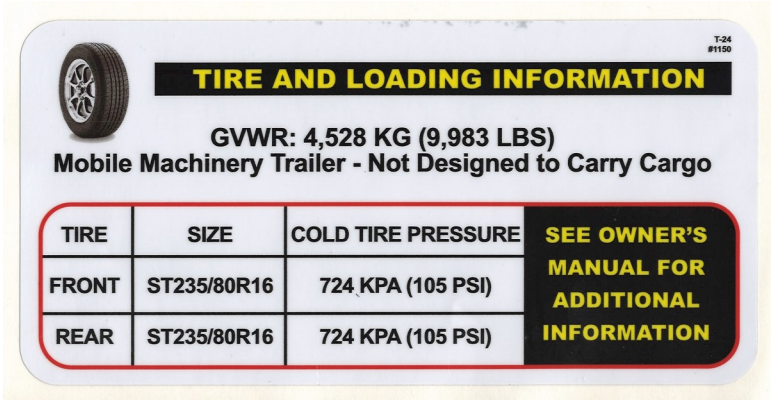
Rev.2.1 (01.17.2023)

VIN NUMBER AND TIRE PLACARDS

BurnBoss T24 machines built after February 2018 are street legal and have a Manufacturer's Certification Label for a Trailer (VIN placard) and a tire placard. They are located on the left trailer tongue near the hitch. The tire placard may also be affixed to the inside of the left access door. Examples are shown below.



Example of T24 BurnBoss VIN Placard



Example of T24 BurnBoss Tire Placard