

PBU Operator Certification

Operation, Safety, and Maintenance of PBU Propane Burnishers

This training aid is designed to educate the operator on proper operation and routine maintenance of the PBU Dust Control Propane Burnisher. Proper operation and maintenance is essential for maintaining the safety, and increasing the over-all life of your propane burnisher. Also described in this training aid are the rules and regulations for the storage and handling of liquefied petroleum gas as set forth by the National Fire Protection Association.

Liquid propane or LP gas is safe, dependable, inexpensive, and has been used as an internal combustion engine fuel for over 40 years. It is however highly flammable. Propane exists as a liquid when stored under pressure, but becomes a vaporized gas when pressure is released. The vaporized gas is heavier than air and will collect at the lowest confined space available. Because of its flammability smoking is strictly prohibited when working with or near propane fuel.

Safe handling of propane gas begins with a properly filled tank. Most propane powered floor machines run on a vapor withdraw system. Therefore, these tanks must only be filled to 80% capacity to allow for proper vapor expansion. Overfilled propane tanks are hazardous and will damage fuel system components. Raw propane is a super cold vapor that can freeze skin and cause frostbite, so remember to wear heavy gloves when refilling or venting your propane tank.

PBU propane burnishers are equipped with 80% safety fill tanks. This style of tank prohibits further filling once the 80% level is reached.

Familiarize yourself with these components of your propane tank.

- The service valve
- Liquid level gauge
- Sight gauge
- Pressure relief valve

The service valve is used by an authorized propane dealer to fill the tank. It is equipped with a quick connect fitting for an easy burnisher hook-up.

The fixed liquid level gauge is used to indicate the 80% capacity of the tank. This gauge is left open when filling by volume. When the escaping vapor turns to liquid this gauge is closed and the propane dealer stops filling the tank.

The liquid level sight gauge gives a visual indication of the tanks remaining fuel, but because of the expansion properties of propane, this gauge is not always reliable, and should only be used as a reference of remaining fuel while running the machine.

The pressure relief valve is a built in safety device. If the pressure inside the tank exceeds 240 psi the valve opens and releases excess pressure. When the pressure falls back below 240 psi the valve will close.

As previously stated an overfilled tank will damage machine components and void their warranty. Use of an overfilled propane tank is evidence by frost on the fuel regulator. If you think your tank has been filled above the 80% level, vent the excess propane before reconnecting to the burnisher. To do this, take the tank outdoors, use protective gloves, and slowly open the fixed level gauge. When the escaping vapor is no longer visible, close the fixed liquid level gauge and reinstall the tank onto the burnisher.

All PBU supplied propane tanks are constructed to the federal department of transportation pressure safety codes. Use of tanks not intended for floor machines such as those from a barbeque grill or forklift are strictly prohibited.

Before you begin your burnishing operation, always complete the following routine maintenance checks.

Inspect the bonnet filter on top of the engine and rinse with soap and water if necessary, then dry by shaking it.

Also inspect the foam air filter covering the paper air filter element at the carburetion intake. If necessary, rinse the foam filter with soap and water, then shake or blow out excess water. Next, saturate the foam filter with engine oil, then wrap it in a clean cloth and squeeze to remove excess oil.

Inspect and clean the paper filter element by gently tapping to remove dust. If very dirty, replace the element with a new one. The paper element should be routinely replaced every 200 hours.

Be careful to position the foam filter over the paper filter upon reassembly.

Next check the engine oil level. On the Kawasaki engine, unscrew and remove the dipstick, wipe with a clean rag, then reinsert, but do not screw the dipstick in, simply insert fully, remove and inspect. If the oil level is low add the appropriate engine oil as recommended in the engine owner's manual through the dipstick inlet. Recheck the oil level after toping off. Be careful not to overfill.

Engine oil should be change every 20 hours of operation to obtain maximum life of the engine. Be sure to never allow the engine to run longer than 100 hours without changing the oil. To drain the oil, release the drain tube into a container, then turn the $\frac{1}{4}$ turn valve at the base of the tube. Change the oil filter upon each change of the oil. Refill with oil through the dipstick inlet using 1.8 quarts of oil as specified in your engine manual.

To inspect the pad and pad driver, tip the burnisher back. Remove the pad and check the pad driver for damage. Always use a pad that is clean and at least a third of an inch thick. Flip the pad over or install a new one if necessary. Inspect the dust skirt and boot for any tears or damage.

PBU Dust Control models are equipped with a dust control system that uses a standard automotive style filter. The high capacity filter is located under the propane tank platform. Clean the filter and accumulation chamber daily before each use of the machine. To clean the filter of light dust, blow from the inside out with compressed air. The filter should be replaced every 100 hours of machine run time. Consult your owner's manual for information on the correct replacement filter.

Retrieve the propane tank from the outside locked storage cabinet and check for overfilling. Remember never to vent propane indoors. Install the tank on the machine with the service valve inlet facing forward. Hand-tighten the brass fuel line fitting onto the service valve inlet. The brass fitting must be completely seated. Never use a wrench to tighten.

Open the service valve to about $1\frac{1}{2}$ turns counter clock-wise.

Make sure the burnisher is tilted back so the pad is off the floor. Now engage the starter for a maximum of 5 seconds or until the engine starts. Do not apply any throttle until after the engine starts.

Some PBU models are equipped with Carb Gard™, a state-of-the-art emissions control system. This system monitors exhaust elements and alerts the operator when emissions are high so that maintenance can be achieved to lower the emissions to an acceptable level. If maintenance is not performed, Carb Gard™ will shut down the engine to protect the environment from high emissions.

Carb Gard™ has three indicator lights, located next to the key switch on the control console. The “Alert” light starts flashing when the engine is started. After the three minute warm up period the light stops flashing.

At that time the “Idle” light starts flashing. The “Idle” light will flash whenever the engine is idling. The machine should not be left idling for longer than two minutes. If it is, the engine will shut down, and the “Idle” light remains on solid, indicating why the engine shut down.

If emissions are high while running, the “Service” light will start flashing. It will flash for up to one minute, and if the increased emissions have not cleared, the engine will shut down, and the “Service” light will remain on solid, indicating service is required.

Some models of PBU Burnishers are also equipped with a catalytic muffler to further assure safe air quality. Be careful, do not touch the catalytic muffler. It is hot during, and for some time after operation, and could cause a burn.

When you are ready to begin burnishing advance the engine to full throttle, begin walking and slowly lower the burnishing head to the floor. For best results, keep a moderate walking pace and overlap each pass by 2 to 3 in. Never run with the burnisher. Moving too fast is not only a potential danger to those around you, but also will lessen the desired shine on the floor.

Remember also to always keep the burnisher moving. Leaving the burnishing head in one spot for more than a few seconds can damage the finish and even the floor itself.

The pad is spinning very rapidly so keep your hands, feet, hair, arms and clothing away from the spinning pad.

When your burnishing operation is complete, relax the machine back to lift the head off the floor. Close the service valve on the propane tank by turning clock-wise and allow the engine to run until it stops from lack of fuel, then, on battery start models, shut off the key switch.

Disconnect the fuel line from the tank and remove the tank from the machine. Clean off the machine and store it in a secure location.

Now store the propane tank in its locked storage cabinet outside the building.

Safety is extremely important when operating propane powered floor equipment. It is strongly advised that you follow these simple propane safety precautions, and consult your operator's manual for further instructions.

If you ever smell propane gas during operation, shut off the engine and move it outside. Determine, and repair the source of the leak before restarting.

Do not leave the machine unattended.

Do not tip the machine fully upward while the engine is running.

Do not change pads or make machine adjustments while the machine is running.

Do not smoke in the vicinity of propane powered floor equipment.

Always operate propane-powered equipment in well-ventilated areas.

If you need to transport your propane tanks from job site to job site, you should always follow these simple precautions. A propane tank can be transported either on or off the machine. In either case it should be secured to the vehicle in its upright position with the service valve closed. Never leave your tanks in a vehicle unsecured or lying on their side.

Servicing your equipment at the recommended maintenance intervals will insure years of trouble free equipment performance. Consult your PBU and Kawasaki owners manual for these recommended maintenance intervals and procedures. Service on the emissions system should always be preformed by an authorized PBU service representative. Engine maintenance and repairs should be performed by a service representative of the respected engine manufacturer.

For those wishing to obtain certification in propane safety from PBU, a certified operator exam is included with the operator's manual supplied with your machine. All exam material has been covered in this training aid, so it is easy to periodically refresh your memory. Upon successful completion of the exam, a wallet size proof of certification card, and a certificate of achievement will be sent to you.

You are now on your way to a safe, productive and cost effective high speed floor care program which will improve your floors overall shine, durability, and longevity.



Propane Burnisher Training Certification Test

This test is provided to certify operators that have gained sufficient knowledge of operation, safety, and routine maintenance for PBU Propane Burnishers. It should be administered only after review of the Operators Manual for your PBU Propane Burnisher.

Upon completion, send the test to:

PBU Product Manager
Nilfisk-Advance, Inc.
14600 21st Avenue North
Plymouth, MN 55447-3408

Your graded test will be returned. Operators who successfully answer the test will be sent a certificate of achievement and a wallet size proof of certification card.

Employee's Name (Please Print) _____

Address to receive certificate _____

Date _____

Multiple choice. Circle the best answer.

1. Propane Burnishers produce exhaust emissions that
 - a. May be hazardous in a high concentration level.
 - b. May increase in harmful levels if proper routine maintenance is not accomplished.
 - c. Are safe if the machine is well maintained and operated in a well ventilated area.
 - d. All of the above.
2. An overfilled propane tank:
 - a. Is good because you have longer run time.
 - b. Reduces the number of trips to have it filled.
 - c. Helps balance the machine's weight.
 - d. Is hazardous and will damage fuel system components.
3. The propane tank's Service Valve
 - a. Is used by an authorized propane dealer to fill the tank.
 - b. Is where the machine's quick connect fitting attaches.
 - c. Should never have its connection tighten with a wrench.
 - d. All of the above.
4. Propane gas vapor is
 - a. Heavier than air.
 - b. Lighter than air.
 - c. Is highly flammable.
 - d. Both a and c.

5. The propane tank pressure relief valve
 - a. Is opened to vent the tank when filling.
 - b. Is used to fill the tank.
 - c. Is not used on propane burnishers.
 - d. Opens to release pressure exceeding 240 psi.
6. To check for an overfilled propane tank
 - a. Always check outside.
 - b. Always use heavy rubber gloves.
 - c. Vent by opening the Liquid Level Gauge.
 - d. Vent until liquid propane is not visibly escaping.
 - e. All of the above.
7. When the burnisher is not in use, the propane cylinder
 - a. Should be removed and securely stored in an indoor room to protect from theft.
 - b. Should remain secured on the machine as long as there is remaining fuel.
 - c. Should be removed from the machine and stored in a secure outdoor facility.
 - d. Always be refilled when it is over 80% full.
8. Heavy rubber gloves must be worn when venting or filling a propane cylinder because
 - a. Escaping propane gas vapor is cold and can cause frostbite.
 - b. Propane gas is messy.
 - c. Cylinder becomes hot when pressurized.
 - d. None of the above.
9. Never operate the machine with a propane tank that
 - a. Is made for a barbecue grill or fork truck.
 - b. Shows any sign of damage.
 - c. Filled over 80% full.
 - d. All of the above.
10. To stop the engine
 - a. Turn off the key switch and then close the propane Service Valve.
 - b. Close the propane Service Valve, allow time for the engine to stop, and then turn off the key switch if you have a battery start model.
 - c. Allow the engine to run until the tank is empty.
 - d. Take the machine outside.
11. Never
 - a. Leave the machine unattended when not in its storage area.
 - b. Smoke around a propane cylinder, on or off the machine.
 - c. Operate the machine in an area that is not well ventilated.
 - d. All of the above.
12. Toxic emission gasses
 - a. Can be harmful to your health.
 - b. Can be minimized to a safe level with proper building air exchange.
 - c. Can always be smelled.
 - d. a and b, but not c.

13. Each day, before you begin to run the burnisher,
 - a. Check the oil level.
 - b. Inspect and clean the bonnet filter.
 - c. Inspect and clean the spark plug.
 - d. Inspect and clean the foam and paper carburetion intake filters.
 - e. All of the above except c.

14. Never use a pad that . . .
 - a. Is less than 1/3 inch thick.
 - b. Is less than 3/4 inch thick.
 - c. Has been previously used.
 - d. Has not been broken in.

15. The pad retaining ring . . .
 - a. Should be screwed on to center the pad.
 - b. Must be pushed on until it snaps twice.
 - c. Should never be used with a white pad.
 - d. Must be replaced each time you change the pad.

16. The paper filter element at the carburetion intake should be replaced
 - a. Every 20 hours of operation
 - b. Every 40 hours of operation
 - c. Every 200 hours of operation
 - d. This filter never needs replacing

17. Propane engines run efficiently and produce minimum emissions when . . .
 - a. Idling.
 - b. Proper routine maintenance is performed.
 - c. The LP tank is filled to less than 80%.
 - d. Operating in a cold environment.

18. A propane burnisher . . .
 - a. Should never be modified.
 - b. May have routine / daily maintenance performed by a trained operator.
 - c. Must have its oil changed on a regular schedule per the owners manual.
 - d. All of the above.

19. When operating the machine,
 - a. Always keep the burnisher moving on the floor.
 - b. Never run with the machine.
 - c. Never attempt maintenance.
 - d. Keep hands, feet, hair, arms and clothing away from the spinning pad.
 - e. All of the above.

20. If you ever smell propane gas during operation,
 - a. Never shut the machine off indoors.
 - b. Shut the machine off, then remove it outdoors.
 - c. Determine, and repair the leak before restarting.
 - d. Both b and c.