

OPERATION MANUAL

COMMANDER

IMPORTANT SAFETY INSTRUCTIONS



WARNING: Failure to observe these instructions can cause personal injury to machine operator or bystanders.



WARNING: Asphyxiation Hazard. An improperly maintained engine can produce excessive levels of carbon monoxide. Excessive levels of carbon monoxide can make you sick or cause death. **NEVER** operate machine in an area less than 5,000 square feet for more than 15 minutes unless there is adequate ventilation.



WARNING: Fire or explosion hazard. **NEVER** use with flammable or combustible materials, such as gasoline, kerosene, or other fuels or volatile solvents to clean floor. **NEVER** operate this machine in an explosive atmosphere.

INTENDED USE

This machine is intended for commercial use, for burnishing floors in an indoor, well-ventilated environment. NSS does not recommend using this machine for any other purpose.

FOR SAFETY:

- **NEVER** stop or turn the machine on a ramp or incline.
 - **NEVER** attempt to climb a grade or operate this machine on a ramp or incline of more than 8 degrees.
 - **NEVER** park or store the machine near a dock, on ramps, near a furnace, boiler, open flame, or other high heat source.
 - **NEVER** expose the machine to rain, snow, or extreme temperatures.
 - **NEVER** store any items on this machine.
 - **ALWAYS** store this machine indoors in a dry, cool area.
 - **ALWAYS** store or transport LP fuel tank in the upright position.
 - **ALWAYS** use only tank and connections provided with the Commander. This tank is fitted only for vapor withdrawal, not liquid. It has safety features (check valves, etc.) that are not found in tanks regularly found in an LP supplier's yard.
 - **NEVER** fill tank with any fuels other than propane HD-5 Spec. carburetor grade. Do not use blends or butane.
 - **ALWAYS** have a qualified LP dealer fill the tank. The dealer can be found in the yellow pages under "Gas Liquefied Petroleum".
 - **NEVER** store propane tank where unauthorized personnel may tamper with it.
 - **NEVER** alter or change the fuel system as incorrect fuel mixture or gas leakage may result.
 - **ALWAYS** check fuel system components and hoses for leaks before operating.
 - **NEVER** tip the engine on either side. Engine oil can enter the air cleaner and cause the engine to run rich and shut down.
 - **ALWAYS** allow the engine time to cool before performing any maintenance as hot parts can cause severe burns.
- **ALWAYS** read and understand all instructions before operating or servicing machine.
 - **ALWAYS** use this machine **ONLY** as described in this manual.
 - **NEVER** attempt to operate this machine unless you have been trained in its operation.
 - **NEVER** allow an untrained person to operate machine.
 - **NEVER** attempt to operate this machine if it is not working properly or has been damaged in any manner.
 - **NEVER** let go of the handles when the machine is operating.
 - **NEVER** disconnect or modify any switches or safety devices.
 - **NEVER** service machine near fire or flame.
 - **NEVER** operate this machine with any air opening blocked. Keep all air openings free of dust, lint, hair, etc.
 - **NEVER** allow this machine to be used as a toy. Close attention is necessary when used by or near children.
 - **ALWAYS** keep face, fingers, hair or any other body part or loose clothing away from any machine opening or moving part (revolving pad & pad driver).
 - **ALWAYS** use extreme caution when operating the machine on a ramp or loading/unloading this machine into or out of a truck/trailer. Use extreme caution if the ramp is wet, oily, or covered with cleaning chemicals.
 - **ALWAYS** turn the machine off when attaching pads.
 - **ALWAYS** be sure that the ramp is secured to the vehicle before attempting to load/unload.

ALL REPAIR SERVICE MUST BE PERFORMED BY AN NSS AUTHORIZED DISTRIBUTOR/ SERVICE STATION USING ONLY NSS ORIGINAL EQUIPMENT PARTS.

SAVE THESE INSTRUCTIONS



NOISE AND VIBRATION

NOISE

Commander 20 Sound pressure level at Operator position. 85 dB(A)

Commander 27 Sound pressure level at Operator position. 85 dB(A)

VIBRATION

Commander 20 Weighted RMS acceleration value (ISO 5349) 1.6 m/s²

Commander 27 Weighted RMS acceleration value (ISO 5349) 1.95 m/s²

MACHINE INSPECTION

- Now that the machine is unpacked remember to recycle all packing materials.
- Inspect the machine for damage or missing components. If damage is found, contact the local freight company to file a freight claim.

MACHINE COMPONENTS

Engine

The Commander is equipped with an engine specially manufactured to use LP (propane) gas as the fuel source. The engine manufacturer and size (displacement) may vary. Observe the name on the engine and refer to the manual provided by the engine manufacturer.

Fuel Tank

The Commander is equipped with a “vapor” withdrawal type fuel tank with a fuel gauge. It is referred to as a 20 lb. (9Kg.) tank. Empty and full weights are stamped on the side of the tank. Do not use other tanks.

Solenoid Valve and Pressure Regulator

The solenoid valve is an electrical control that stops the flow of LP (propane) gas when the key switch is turned off. The pressure regulator controls the amount and pressure of the LP (propane) gas flowing to the engine. This regulator is preset by the engine manufacturer and is not adjustable.

Adjustments and repairs to the propane fuel system can only be made by a properly trained, and certified Service Technician.

Improper adjustments will cause increased toxic emissions of carbon monoxide and may result in carbon monoxide poisoning.

Battery

The Commander is equipped with a 12-volt maintenance free starting battery that requires no water additions.

A built-in engine charging system maintains the charge.

Pad Driver System

The Commander’s flexible pad driver is powered by a single “V” belt and pulley system. An electric clutch transfers the power of the engine to the belt and pulley system.

Pad Driver

The Commander is equipped with a flexible pad driver with a screw on pad holder. Use approved hair or synthetic type pads.

Consult your local NSS authorized distributor for more complete pad application advice.

Units with Dust Control System

Weekly, check vacuum hose connections at the Flexiwall Shield and cloth filter bag. When the filter bag is more than one-half (1/2) full it needs to be emptied, remove the bag, shake out the dirt, and replace the bag back in the machine. Inspect the Flexiwall Shield for dents, cracks, wear, and dirt. A damaged Flexiwall Shield will greatly reduce the burnishing and dust control capabilities. Dirt build up on the flexiwall shield should be removed.

Control Handles

The Commander has two (2) bicycle type handles for the operator to control the direction of the machine.

Operating the Electric Clutch

The Commander is equipped with an electric clutch. Move the throttle to the slow position, engage the clutch by squeezing the “trigger switch” on the operation handle. Move the throttle to the 3/4’s speed position, slowly lower the pad to the floor while slowly walking forward.

Caution: Never engage the clutch with the throttle in the fast run position, or with the pad on the floor, this may cause damage to the clutch and the floor!

Key Switch

This machine is equipped with a 12-volt electric starter. Below the control handle is the key switch that turns the engine on and off.

Hour Meter

On the right side of the chassis is the hour meter. This meter records the time (hours) that the motor is running. This time record is very critical to the performance of scheduled maintenance procedures. Do not attempt to modify or disconnect this meter.

Carbon Monoxide (CO)

Various levels of carbon monoxide are present in the exhaust gases of all internal combustion engines. Carbon monoxide is an odorless, colorless and tasteless gas.

WARNING: An improperly maintained engine can produce excessive levels of carbon monoxide. Excessive levels of carbon monoxide can make you sick or cause death.

Emissions Sensor

The Commander is equipped with an emissions sensor. It measures the level of certain emissions in the engine exhaust. The manufacturer presets the monitor and warning levels.

- If emissions in the exhaust gasses approach the preset safe levels, the sensor light will signal a warning to the operator to turn off the engine and service the machine.
- If the operator continues to run the machine in this condition, the sensor will shut down the engine.
- If the engine is shut down due to improper emissions levels:
 - Turn the key switch off, close the tank valve and take the machine outside.
 - Open doors and windows to increase the fresh air oxygen (O₂) levels, reducing the carbon monoxide (CO) levels in the building.
 - Check oil level, clean top precleaner, and air filter (refer to maintenance chart)
 - Contact your local NSS authorized distributor or engine service center for assistance.

INITIAL MACHINE SET-UP

Engine

The Commander engine is shipped with oil in the engine crankcase. Always check the oil level before you start the engine. Use 10w30 or 15w40 motor oil with an API designation of SG. The valve on the side of the engine must be closed securely or oil will leak out of the engine.

Refer to the Owners manual provided by the engine manufacturer.

Checking Fuel Cylinder for Overfill

- Take it to a safe area outside.
- Open the fixed liquid level gauge (bleeder valve).
- Observe the gas from the valve:
 - If white cloud: Overfilled!
 - If clear vapor: Tank is not over filled

If overfilled, allow cylinder to vent until vapor is clear.

Caution: Vent gas is very cold, use gloves or pliers when checking the fuel.

Pad Removal and Installation

- Tilt machine back on its rear casters, or in the service position.
- Remove center-lock from pad driver.
- Remove pad from pad holder.
- Center new pad on pad driver and secure with the center-lock ring.

Adjusting Handle Height

This machine is equipped with an adjustable handle for comfort and use. Most find it necessary to adjust the handle to "belt height" for optimum control.

A 9/16's wrench is used to loosen and tighten the pivot points.

Installing Fuel Cylinder

The Commander fuel tank is shipped *empty*. New tanks need to be purged by an authorized LP (propane) gas distributor before use.

- Keep tank upright at all times. Do not overfill tank.
- The fuel tank must be filled with the proper type (HD-5) and amount of LP (propane) gas.
- Take machine to a well-ventilated area.
- Install cylinder on machine with tank strap. The fuel tank must be securely attached to the machine during operation.
- The hose connection from the pressure regulator to the fuel tank fitting must be tight.
- Do not damage threads by over tightening or cross threading.
- Always turn the key switch to OFF then shut the valve on the propane tank to turn the machine off.
- Always remove the fuel tank from the machine and place tank outside in an upright position in a secure, tamper-proof, steel mesh storage cabinet.
- Check with your local fire marshal.

DAILY USE

Burnishing Methods

The Commander is designed to dry burnish or to spray buff a hard surface floor. Each procedure may be performed with a hair type or synthetic type pad. Consult your local NSS authorized distributor for more complete chemical / pad application advice.

Burnishing Path

The Commander's pad driver extends past the frame of the machine. This extension allows burnishing the edge of the floor near obstructed areas (walls or shelving).

- Sweep and dust mop the floor to remove dirt and debris before burnishing. Accumulations of dirt or debris on the floor will reduce machine performance.
- Some spills or stains may need to be pre-cleaned before burnishing.
- Consult your local NSS authorized distributor for procedures and more complete chemical advice.

Daily Preparation

- Inspect machine for damage, loose or missing parts.
- Check oil level in crankcase.
- Clean air precleaner on top of engine and air cleaner filter.
- Remove fuel tank from locked storage container and bring to machine.
- Install tank in position and secure with clamp.
- The hose connection from the pressure regulator to the fuel tank must be tight.
- **NOTE:** Do not damage threads by over tightening or cross threading.
- Tilt machine back on rear casters, or in service position to obtain access to pad driver.
- If necessary change or install new pad on pad driver. Secure pad with pad holding cup.

Transporting the Machine

When transporting the machine from one job to another secure the machine in your truck or van with the fuel cylinder installed and the service valve **OFF!**

Allow the engine to cool down some before loading it.

Storing the Machine

- Always turn the key switch **OFF** then shut the valve on the propane tank.
- Remove the key when work has been completed or if machine is left unattended at any time.
- Remove the propane cylinder and store outside.
- Perform all daily maintenance procedures.
- Store machine in a cool, dry, secure area where it will not be damaged by other traffic.
- Tilt the machine back on the rear casters with the pad off of the floor.

MANDATORY PERIODIC MAINTENANCE

It is important for you to maintain a record of the amount of machine operating hours in order to perform this machine maintenance. The maintenance procedures shown in the chart on the following page must be performed at the designated intervals. Failure to perform maintenance procedures will result in poor machine performance, component damage and may void the warranty. We recommend the service procedures be performed by an NSS authorized service center or the authorized service center for the engine manufacturer.

IMPORTANT: Preventative maintenance is the Responsibility of the Operator.

To keep the machine in good working condition, simply follow the daily, weekly, and monthly maintenance procedures.

Daily Maintenance

(Every 4 hours of operation)

- Check oil level.
- Clean recoil filter.
- Check and clean carburetor air filter.
- Check belt tension by pinching belt together. Belt should deflect only 1/2" (13mm).
- Make sure all components are secure and tight, (pad holder, fuel cylinder etc.).
- Check pad holder and pad daily (clean or replace).
- Clean machine, if compressed air is available blow dust from machine and engine, concentrating on the inside of the engine shrouds.
- Wash undercarriage.
- On dust collection units, clean dust collection bag.

Weekly Maintenance (Every 20 hours of operation)

- All checks made on a daily basis plus:
- Change oil and oil filters at 50 hours of service. Use 10w30 Motor Oil or other no ash motor oils designed for use in propane engines. Use of non-recommended oil may void the engine warranty. (See engine Owners manual.)

- Check for loose nuts and / or bolts on entire machine.
- Examine all propane fuel components for leaks or wear. Replace if necessary.
- Grease wheels. Use white lithium grease only and no more than 1 pump of grease. More grease than recommended will push the seals and dust covers out. Allowing dust and other foreign materials to penetrate the bearing, shortening the life of the bearings as well as allowing grease to drop from the wheels to the floor.

Monthly Maintenance

(Every 80-100 hours of operation)

- Perform all daily and weekly services. Consult engine Owners manual for the following:
 - Torque head bolts.
 - Check valve clearance.
 - Torque valve cover bolts.
 - Inspect spark plugs. Replace if necessary.
 - Remove engine shroud and clean cooling fins.

Quarterly Maintenance

- (Every 250 hours of operation)
- Perform all of the monthly maintenance items.
- Have engine serviced by Authorized Service Center. Including emissions check.

Adjusting Belt Tension

Tools required:

- 3/4" (19mm) open-end wrench
- 15/16" (24mm) deep well socket
- Loosen mounting bolt on the topside of machine deck while holding adjusting nut on underside of deck.

NOTE: The mounting bolt must be loosened before adjustment can be made.

- Rotate adjusting nut counter clockwise with socket to apply tension to belt.
- While holding the tension on the adjusting nut, tighten the mounting bolt on the top of the deck.
- Check belt tension by pinching belt together. Belt should depress only 1/2" (12mm).

Always turn the key switch OFF, shut tank valve, and remove key before performing any maintenance.

Authorized Repair Service

Repair service for this machine must be performed by an NSS authorized service center. Repairs performed by any unauthorized company will void the machine and engine warranty. If you require assistance finding an authorized service center, please contact NSS Enterprises.

PERIODIC MACHINE MAINTENANCE SCHEDULE

MAINTENANCE OPERATION	MAINTENANCE FREQUENCY						
	Break in after first 25 hours	Every day or every 8 hours	Every 50 hours	Every month	Every 100 hours	Every 200 hours	Every 1,000 hours
Inspect machine (engine, pad, pad driver, etc.).		● ¹					
Check oil level.		●					
Clean air precleaner (top).		● ²					
Clean air cleaner foam wrapper.			● ²				
Clean cylinder cooling fins.			●				
Change engine oil and oil filter.	●		●				
Lubricate wheels.	●		●				
Check starting battery connections.				●			
Replace air cleaner element and foam wrapper.						● ²	
Adjust engine valve clearance Adjust after first 50 hours of use.	● ³				● ³		
Replace LPG filter.						● ³	
Replace spark plugs.						●	
Replace oxygen sensor.							● ³
Replace catalytic muffler.							● ³
Clean cylinder heads.							● ³

1. Check for oil, fuel, and exhaust leaks, loose parts and unusual noises and vibrations.
2. Do not oil filters.
3. Must be performed by a qualified mechanic according to the engine Service Manual.

TROUBLESHOOTING

PROBLEM	CORRECTIVE ACTION
1. The engine fails to crank.	<ul style="list-style-type: none"> a. Clean and tighten the positive (+) and negative (-) battery cable connections at the battery and at the engine. b. Check the plug connection between the battery and the engine. c. Recharge the battery. Refer to the equipment or battery manufacturer's recommendations.
2. The engine cranks slowly.	<ul style="list-style-type: none"> a. Clean and tighten the positive (+) and negative (-) cable connections at the battery and at the engine. b. Recharge the battery. Refer to the equipment or battery manufacturer's recommendations. c. Change engine oil to oil having the proper viscosity for the ambient temperature.
3. The engine cranks but fails to start.	<ul style="list-style-type: none"> a. Check the LPG container, if low on fuel, fill it, if over-filled, return to filling station for adjustment. b. Check, and if necessary, reconnect the fuel line to the <i>vapor-withdrawal fitting</i> on the LPG container. c. Slowly open any closed fuel shut-off valves. d. Service the air cleaner. Do not soak with oil! e. Clean the cooling air precleaner (top). f. Check to make sure the spark plug cable is on tight. g. Replace the spark plugs. h. Check the oil level and add oil if necessary. i. Check both ends of the vacuum hose to make sure it is on tight. j. Reconnect any loose wiring. k. Make sure the proper type of LPG container is being used. The container must have a <i>vapor-withdrawal fitting</i> to supply the engine with fuel. l. Check for blown head gasket. See Engine Owners manual for servicing. m. Fuel system out of adjustment. <p>Note: Only properly trained service technicians should adjust or repair fuel system.</p> <ul style="list-style-type: none"> n. Check for defective ignition system. See Engine Owners manual for servicing.
4. The engine runs and then stops.	<ul style="list-style-type: none"> a. Check the LPG container and fill as necessary. <i>On cold days, the LPG container may have to be kept at least half-full to provide the rate of vaporization necessary to keep up with the engine fuel demand.</i> b. Check, and if necessary, reconnect the fuel line to the <i>vapor-withdrawal fitting</i> on the LPG container. c. Check the engine oil level and add oil as necessary. Drain excess oil if the level is above the dipstick "Full" mark.
5. Odor of burned rubber.	<ul style="list-style-type: none"> a. Belt out of adjustment. See "adjusting belt tension".
6. Engine overheats.	<ul style="list-style-type: none"> a. Check for incorrect oil level. See Engine Owners manual for servicing b. Check for build up of dirt inside engine shroud. See Engine Owners manual for servicing.

7. The engine lacks power.	<ul style="list-style-type: none"> a. Service the air cleaner. b. Check the LPG container and fill as necessary. <i>On cold days, the LPG container may have to be kept at least half-full to provide the rate of vaporization necessary to keep up with the engine fuel demand.</i> c. Check for improper valve clearance. d. Check for faulty spark plugs. e. Check for improper oil level. f. Check for worn rings. See engine Owners manual for servicing.
8. The engine exhausts black smoke.	<ul style="list-style-type: none"> a. Service the air cleaner.
9. The engine misfires.	<ul style="list-style-type: none"> a. Replace the spark plugs. Check connections. b. Check valve clearance.
10. High fuel consumption.	<ul style="list-style-type: none"> a. Check for faulty spark plugs. b. Check for dirty air cleaners. c. Check for improper fuel system adjustment. <p>Note: Only properly trained service technicians should adjust or repair fuel system.</p>
11. Machine stops suddenly.	<ul style="list-style-type: none"> a. Check fuel level. b. Check for faulty spark plugs or wires. c. Check to see if pad is centered on pad driver. d. Check for correct pad size. e. Check oil level.
12. Excess vibration.	<ul style="list-style-type: none"> a. Check to see if any bolts are loose on the engine or deck. b. Check to see if pad is centered or if pad is damaged. c. Check for correct oil level. d. Check for engine overload. e. Check for dirty filters. f. Check for faulty spark plugs.



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