Thank you for purchasing a Harper Turf Vac.

As with all Harper products, the Turf Vac has been developed through tough design and testing procedures to produce a top quality machine. This manual gives assembly, operating, and service information for the model TV30 Turf Vac. Please read and understand all instructional material included with the Turf Vac or its components before assembling and operating the equipment.

A Turf Vac can present hazards to an operator who follows unsafe procedures in either the operation or maintenance of the unit. Therefore, SAFETY WARNINGS are presented at certain locations in the text.

THIS SYMBOL: 

⚠️ SAFETY WARNING! ⚠️

MEANING: Failure to understand and obey this warning may result in injury to you or others. Whenever this symbol is used, please pay very close attention to the information presented, and make sure you fully understand. If you do not, contact your dealer or Harper Industries, Inc. for clarification.

⚠️ SAFETY WARNING! ⚠️

ALL SHIELDS AND GUARDS MUST BE IN PLACE FOR PROPER AND SAFE OPERATION OF THIS EQUIPMENT. WHERE THEY ARE SHOWN REMOVED IN THIS MANUAL, IT IS FOR PURPOSES OF ILLUSTRATION AND INSTRUCTION ONLY. DO NOT OPERATE THIS EQUIPMENT UNLESS ALL SHIELDS AND GUARDS ARE IN PLACE.

Harper Industries, Inc. is continually striving to improve the design and performance of its products. We reserve the right to make changes in specifications and design without thereby incurring any obligation relative to previously manufactured products.

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The Harper name is a registered trademark of Harper Industries, Inc. All other brand and product names are trademarks or registered trademarks of their respective companies.
THE HARPER TV30 TURF VAC IS WARRANTED AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF TWELVE MONTHS FROM THE ORIGINAL DATE OF RETAIL PURCHASE TO THE ORIGINAL PURCHASER.

Harper Industries will repair or replace, at our option, any part which our examination shows to be defective. Warranty is limited to parts, labor and ground freight delivery of replacement parts. The user will pay freight charges for parts submitted under this warranty.

No product or part may be returned for warranty consideration without prior approval from Harper Industries.

This warranty does not apply to parts subjected to misuse, abuse, alteration, improper or inadequate maintenance, or normal wear (including belts and broom).

Engines are not covered under this warranty. Refer to manufacturer's warranty for specific warranty information. Harper Industries, its agents or representatives, make or imply no other warranties.

DATE OF PURCHASE ______ / ______ / ______

DEALER'S NAME _________________________________

DEALER'S PHONE _________________________________

SERIAL NUMBER MACHINE __________________________

SERIAL NUMBER ENGINE ___________________________
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## Specifications

<table>
<thead>
<tr>
<th><strong>Power</strong></th>
<th>Diesel - Kubota 44 hp 4-Cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td>Self-contained, 4-wheel configuration with front steering, two rear drive wheels, and a rear mounted, high-lift, debris hopper with patented recirculating vacuum air technology</td>
</tr>
<tr>
<td><strong>Sweeper</strong></td>
<td>Head 60” single sweeping reel with nylon bristle brush, follows all terrain with two caster wheels mounted on sweeper head (vertical and horizontal float), rises to transport position, lowers to operating position by hydraulic cylinder</td>
</tr>
<tr>
<td><strong>Fan</strong></td>
<td>25” diameter with 6-blade radial fan, fan housing includes UHMW liner</td>
</tr>
<tr>
<td><strong>Debris Hopper</strong></td>
<td>Capacity – 3.5 cubic yards</td>
</tr>
<tr>
<td><strong>Lift</strong></td>
<td>Rises 6’4” above the ground to dump debris into vehicle or container</td>
</tr>
<tr>
<td><strong>Lift Safety</strong></td>
<td>5° Inclinometer Sensor with lift interlock that prevents hopper from lifting if the machine is on a slope greater than 5°</td>
</tr>
<tr>
<td><strong>Drive</strong></td>
<td>Hydrostatic pump directly coupled to engine drives two Poclain high-efficiency piston drive hydraulic motors on rear wheels with two speed operation and differential lock, foot operated pedal for forward and reverse drive</td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td>Infinitely variable, 0-8 mph low (operation), 0-14 mph high (transport), 0-7 mph reverse Braking Dynamic braking through the hydrostatic drive system, mechanically applied and hydraulically released parking brake on rear wheels</td>
</tr>
<tr>
<td><strong>Main Frame</strong></td>
<td>¼” and 7 gauge steel frame</td>
</tr>
<tr>
<td><strong>Tires/Wheels</strong></td>
<td>Front (2) 20-10x10 4-ply premium turf tire, Rear (2) 26-12x12 6-ply premium turf tires</td>
</tr>
<tr>
<td><strong>Compaction</strong></td>
<td>11.2 psi in front, 7.8 psi in rear</td>
</tr>
<tr>
<td><strong>Steering</strong></td>
<td>Power steering with automotive type steering wheel, tilt steering</td>
</tr>
<tr>
<td><strong>Controls/Gauges</strong></td>
<td>Hydraulic lift/lower of debris hopper, Hydraulic open/close of debris hopper tailgate, Hydraulic raise/lower of sweeping mechanism head assembly, Solid State max grade detection for dump circuit</td>
</tr>
<tr>
<td><strong>Seat</strong></td>
<td>Tethered, high back, adjustable position</td>
</tr>
<tr>
<td><strong>Electrical</strong></td>
<td>12 volt, electronic key start</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>Length – 144 in., Height – 94 in., Width – 65 in., Wheel Base – 84 in.</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>5220 lbs.</td>
</tr>
<tr>
<td><strong>Liquid Capacities</strong></td>
<td>Fuel – 11 Gallon; Hydraulic Fluid – 19 Gal</td>
</tr>
<tr>
<td><strong>Safety &amp; Hydraulic Oil</strong></td>
<td>Includes Certified ROPS and seatbelt, outriggers for safety during dumping and a Terresolve EL 3068, bio-based, high-performance, ISO 68 – viscosity, severe service</td>
</tr>
</tbody>
</table>

**NOTE:** Following publication of this manual, certain changes in standard equipment and/or options may have occurred which would not be included in these pages. Your Harper dealer is the best source for up-to-date information.
Control Identification

**ROPS** – Roll-Over Protective Structure is certified and designed to protect operator in case of a roll-over. Always wear a safety belt.

**Steering Wheel** – steering is hydraulically controlled. Turning radius of the sweeper head is approximately 46 in. Steering wheel angle may be adjusted with tilt knob.

**Control Panel** – all functions of the turf vac may be controlled from the operator’s seat.

**Foot Pedal** – hydrostatic pump is controlled by pushing foot pedal forward and backward.

**Lift Mechanism** – raises the bottom of the hopper to a height of 6’4” to dump into a vehicle or container. **Use extreme caution when raising the hopper as the top can reach approximately 13½ feet.**

**Fan Housing** – surrounds the impeller and is protected on the inside by a plastic liner.

**Sweeper Deck** – has a 60” rotating brush and is designed to keep the vacuum concentrated on the ground.

**Engine** – Diesel – 44 HP Kubota

**Hopper** – stores up to 3½ cubic yards of material. Always empty hopper at end of operation.

**Hopper Door** – opens, closes and locks when the switch is activated by the operator.
Hopper Lift Height Decal – always keep the height of the turf vac in mind during operation and be alert for wires, branches, etc. If this decal is damaged, replace it immediately.

Fan ON/OFF – turn fan on while engine is from low (diesel) to mid-throttle (gasoline).

Broom ON/OFF – turn broom on while engine is from low (diesel) to mid-throttle (gasoline).

Hopper UP/DOWN – raise hopper with extreme caution. Stabilizer arms will extend before hopper raises and will retract after hopper is lowered. Make sure stabilizer arms are stowed completely before sweeping.

Door OPEN/CLOSE – hopper door is hydraulically opened and closed with switch.

Operation Speed HI/LO – ALWAYS SWEEP WITH TRANSMISSION IN LOW. Use high range when traveling between operations.

Park Brake ON/OFF – set park brake when unit is not in use or is parked on an incline. Make sure park brake is disengaged before operation.

Park Brake Indicator – light illuminates when key switch is on and park brake is set.

Deck Lift – sweeper deck height may be adjusted for conditions and performance.

Throttle – adjust engine speed with throttle. Start at low throttle, allow engine to warm up, then operate unit at full throttle.

Ignition – turn key to right to start unit. Remove key when unit is not in use. Never leave unit unattended with key in ignition.

Engine Preheat – use the pre-heat position on the ignition switch when starting a cold engine. Hold the ignition key in that position until the glow lamp turns off. Preheating may not be needed if the engine is already warm.
**Hopper Lift Cylinder** – hopper may be raised to empty debris into a vehicle or container.

**Safety Lock** – use safety lock whenever maintenance is performed. Make sure weight of raised hopper rests on safety lock by relieving pressure on cylinder with switch. Remove safety lock before lowering hopper.

**Impeller** – impeller is enclosed in fan housing. Make sure unit is turned off and key is removed from ignition before attempting any service.

**Liner** – inspect liner frequently for wear. Replace liner before it wears through to fan housing.

**Inclinometer Switch** – senses incline of machine and prevents the hopper from lifting if it senses an incline greater than 5°.

⚠️ **SAFETY WARNING!** ⚠️

Do not leave Turf Vac unattended, or attempt any service or inspection unless the machine has come to a complete stop and the engine has been shut off.
Safety Guidelines

Equipment & Controls
- Read and understand this manual.
- Altering this equipment in any manner which adversely affects its operation, performance, durability, or use will void the warranty and may cause hazardous conditions.
- Know the location and function of all controls and how to stop this equipment quickly in an emergency before you operate the equipment.
- Keep all nuts, bolts and screws tight to help ensure safe operation of this equipment.
- Use genuine factory parts or parts with equivalent characteristics, including type, strength and material. Failure to do so may result in product malfunction and possible injury to the operator and/or others.
- If hardware is not secure, or if some of the hardware is over-tightened, equipment failure may result, posing possible safety hazards.
- To prevent possible eye injury, always wear SAFETY GLASSES while operating equipment.

Safety Decals
- If safety related or instructional decals become illegible or are removed, replace them immediately. New decals may be obtained from your local Harper Dealer.
- If you replace parts that have such decals attached to them, make sure the decals are replaced with current versions, and are on the replacement parts before the machine is operated again.

Diesel Fuel
- Always use an approved container for transporting diesel fuel.
- Do not allow open flames or sparks while performing maintenance or refueling.
- Never remove fuel tank cap or add fuel when engine is running or while it is hot.
- Only use ultra low sulfur diesel.
- Never fill fuel tank indoors. Fumes are heavy and will sink to the lowest point, collect and become hazardous.
- Wipe up spilled fuel immediately.
- Do not store fuel in a room with an appliance that has a gas pilot or electrical switch that may cause sparks.
- Always store diesel outside in a safety can (a can with flame arrestor and pressure relief valve in pour spout).
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- Be certain to provide adequate ventilation if an engine must be run indoors - exhaust fumes are dangerous.

⚠️ SAFETY WARNING! ⚠️
Diesel fuel is extremely flammable and can be highly explosive.

Guards & Shields
- Keep all safety devices in place.
- Replace all worn, damaged, unusable, missing or lost safety shields and guards before operating the equipment.
- Keep the equipment in good operating condition.
Battery

**SAFETY WARNING!**

Batteries can produce explosive gas. Use extreme caution when working on the battery.

- Ventilate when charging battery or using in an enclosed space.
- DO NOT produce sparks from cable clamps, tools, or other sources; and DO NOT allow flames or smoking in the vicinity of the battery.
- Shield eyes when working near battery.

Hydraulics

**SAFETY WARNING!**

Escaping fluid under pressure can penetrate skin causing serious injury. To prevent serious injury or death:

- Relieve pressure on system before repairing, adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks.
- Use wood or cardboard instead of hands when looking for leaks.
- Keep all components in good repair.
- Do not use any type of heat (welding, soldering, cutting torch, etc) near pressurized lines.

Before Operation

- Before operating this equipment, read and understand the Owner’s Manual.
- Do not allow children to operate this machine.
- Wear approved eye and ear protection and other appropriate safety equipment while operating the machine.
- Check tire pressure and fill to specifications.
- Engine settings are preset and should not be changed; any change can damage moving parts and void the warranty.

During Operation

- Always keep a fire extinguisher near the Turf Vac during operation.
- Keep clothing and all body parts away from rotating parts.
- When sweeping material into the machine, make certain there are no foreign materials such as rocks, cans, bottles or other hard materials included. Sweeping hard materials will reduce the life of the plastic liner in the blower housing.
- If a foreign object should strike the broom or blower mechanism and cause an unusual noise or vibration, shut the engine off immediately and allow it to come to a complete stop. Disconnect the spark plug wire from the spark plug and the power unit. **Do the following:**

  1. Inspect for damage.
  2. Repair or replace any damaged parts.
  3. Check for and tighten any loose bolts, nuts, fasteners or parts.

- Keep the engine area clean from debris and other accumulations to lessen the possibility of fire.
Hydraulic System

- The hydraulic system of the TV30D is filled at the factory with Terresolve EnviroLogic 3068 High Performance Biodegradable Hydraulic Fluid which has an ISO of 68.
- The TV30D has a 10 micron, beta rated hydraulic oil filter designed for long life.

- On a daily basis, monitor the needle in the filter indicator when the oil is at normal operating temperature.

- The element (part no. 822002) does not need replaced until the needle is in the red portion of the gauge.
- To replace element, remove cap and twist element counter-clockwise. Insert new element, turn clockwise and replace cover.

- The hydraulic oil level should be monitored daily with the oil dip stick located on the top of the hydraulic oil reservoir next to the filter indicator.
- Keep the hydraulic oil near the full mark at all times. Do not over fill.
- Fill reservoir through the fill location on top of the reservoir.

To get to the engine oil fill, dipstick, or fuel filter.
**Grease Zerk Locations**

**Left Side**
- Front Pivot
- Deck Lift (L)
- Broom (L)
- Front Axle (L)
- Roller (L)
- *same zerk

**Right Side**
- Front Axle (R)
- Deck Lift (R)
- Broom (R)
- Roller (R)

**PROCEDURE**
1) Park on level ground and set park brake.
2) Lower broom to the ground.
3) Turn off Turbo Vac.
4) Give 2 to 3 shots of grease after every 10 hours of use.

**Air Cleaner**
- Make sure intake is always free of debris.
- When engine is turned off, loosen clamps on air cleaner to access primary and secondary elements.
- Replace both elements according to the Maintenance Schedule.

**Air Intake**
- Primary Element
- Secondary Element
Cooling System

- Clear hydraulic oil cooler and radiator of debris with pressurized air daily or as needed.
- Remove screen on side of oil cooler to clean properly. It is released by pulling the tabs located on top and bottom of the screen.
- Remove vent in front of radiator if needed to clean.
- Check radiator level daily and only when engine is cool and not running.
- Remove cap (radiator fill) slowly to relieve any pressure that may be built up.
- Fill up radiator with coolant (50% water/50% antifreeze) until coolant is visible in neck of radiator.
- Make sure that the coolant recovery bottle has at least 1” of coolant in bottom. The presence of coolant in the recovery bottle does not mean radiator is full.
- Do NOT operate the machine if the engine temperature exceeds 220°F. Severe engine damage may occur if the machine is continuously operated above 215°F. If overheating does occur, diagnose the cooling system and ensuring proper coolant levels and proper air flow across the radiator.

Ensure that the radiator is clean and the coolant level is correct.

SAFETY WARNING
Hot Coolant and steam from the radiator can cause severe burns. Never open the radiator cap of a hot engine.

Engine Oil

- The dipstick and engine oil fill are located on the back left side of the engine.
- The engine oil filter is located at the back of the engine and it is accessible from the bottom.
- To get to the engine oil fill or dipstick, the cover must first be taken off by removing the two wing bold on the top of the cover (see image on previous page spread).

PROCEDURE

- Check engine oil level only when engine is turned off.
- Keep engine oil level between the FULL and ADD marks on dipstick at all times. DO NOT OVER-FILL.
- Add engine oil (S.A.E. 10W30) through the engine oil fill location.
- Replace the engine oil according to the Maintenance Schedule.
- Replace the engine oil filter according to the Maintenance Schedule.

SAFETY WARNING
Keep dipstick and oil fill cap secured tightly. Engine oil may escape through these orifices when engine is running causing severe burns.
Fuel Filter

- Fuel filter is located under the same cover as the engine oil fill and dipstick at the back left side of the engine.
- The Fuel Shut-off valve is located directly under the fuel tank itself, and to get to it, the rear shield must first be removed (see fuel tank schematic in parts section for details on placement of fuel shut-off).

Moving the Machine without Starting the Engine

- In order to move the machine without the engine running, the park brake must be released and the bypass valve must be opened.

Park Brake Release

- The two rear wheel motors each contain a park brake that is applied whenever the engine is off (zero system pressure).
- Always release the park brake (inside left and right rear wheel motors) when towing or pushing the unit.

PRECAUTION

- Towing or pushing the unit with the park brakes applied may cause serious damage to internal brake parts.

Relay Panel

- Refer to the parts section for relay and corresponding functions.
PROCEDURE
• Remove plastic plug from the center of the park brake housing.

• Install break release tool (P/N 575064) by placing on brake housing and tightening the screw into the piston.

• Tighten the nut until the motor shaft turns freely.

• After towing the unit, follow procedure in opposite order to remove brake release tool and install new plastic plug.

Opening the Bypass Valve
• The bypass valve is located on the top side of the propulsion pump. The valve can be accessed easiest with the hopper up and the engine shields removed. If the hopper is down, access it by removing the shields on the right side of the machine.
• Open the bypass valve when moving the TV30 for short distances.
• The bypass valve is not a tow valve.
PRECAUTIONS
• The bypass valve is intended only for moving a vehicle a very short distance and is not intended for towing a vehicle behind a truck or tractor. Note: Serious damage to the hydrostatic drive will result if the vehicle is towed.
• Close the bypass valve tightly when finished moving unit. Failure to close valve tightly will result in full or partial loss of power.

PROCEDURE
• First, loosen the jam nut.
• Then turn the ¼" hex counter-clockwise a minimum of 2 full turns to ensure complete hydraulic system bypass.
• To close the valve, turn the valve clockwise until seated and then tighten the jam nut.

SAFETY WARNING!
Refer to the Standard Torque Chart whenever bolts, nuts or screws are tightened.

PRECAUTIONS
• When tightening two or more fasteners on the same part, DO NOT tighten the fasteners completely one at a time. To avoid distortion, first tighten all fasteners in sequence to one-third of torque value, then tighten to two-thirds of torque value, then tighten to full value.
• All lugnuts should be torqued to 140 ft-lbs (190 N-m).
Maintenance Schedule

- See the Kubota Operation and Maintenance Manual provided with the TV30D for a detailed description of all maintenance and service procedures for the engine.
- For the TV30D, Harper Industries recommends the following:

**Daily or Before Starting Engine**
- Check for leaks, smell of fuel, loose or damaged parts
- Check radiator and oil cooler
- Check air cleaner intake
- Check engine coolant level
- Check engine oil level
- Check hydraulic oil level
- Fill fuel tank
- Visually inspecting fittings and hoses
- Grease
- Check tire pressure
- Check lights
- Check hydraulic filter indicator
- Check all engine screens

**Every 50 hours**
- Check of fuel pipes and clamp bands
- Draining water separator
- Check lugnuts

**100 Hour Maintenance** – Perform these and all previous items:
- Check outer air cleaner element
- Change engine oil
- Check battery

**250 Hour Maintenance**
- Change outer air cleaner element
- Check inner air cleaner element
- Check battery electrolyte level
- Check fan belt tightness
- Check radiator hoses and clamp bands
- Check intake air lines

**Annual or 500 Hour Maintenance** – Perform these and all previous items:
- Change engine oil filter
- Change fuel filter
- Check hydraulic oil condition
- Change inner air cleaner element

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**Grease Locations**

**Daily or Before Starting Engine**
- See Grease Locations

**Every 50 hours**
- Visually inspecting fittings and hoses
- Grease
- Check tire pressure
- Check lights
- Check hydraulic filter indicator
- Check all engine screens

**100 Hour Maintenance** – Perform these and all previous items:
- Check outer air cleaner element
- Change engine oil
- Check battery

**250 Hour Maintenance**
- Check outer air cleaner element
- Change engine oil filter
- Change fuel filter
- Check hydraulic oil condition
- Change inner air cleaner element

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**Harper Equipment**
**TV 30**

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16
Removal of sediment in fuel tank

☐ Cleaning of water jacket (radiator interior)
☐ Replacement of fan belt...........................................................Harper part no. 342048
☐ Cleaning of water separator

1000 Hour Maintenance – Perform these and all previous items:

☐ Change hydraulic oil................................................................19 gal. Terresolve EL 3068
☐ Check valve clearance

Every One or Two Months – Perform these and all previous items:

☐ Recharge battery

1500 Hour Maintenance– Perform these and all previous items:

☐ Check of fuel injection nozzle injection pressure

3000 Hour Maintenance – Perform these and all previous items:

☐ Check turbo charger
☐ Check injection pump
☐ Check fuel injection timer

Every Two Years Maintenance – Perform these and all previous items:

☐ Change radiator coolant (L.L.C.)
☐ Replacement of battery
☐ Replacement of radiator hoses and clamp bands
☐ Replacement of fuel pipes and clamp bands
☐ Replacement of fan belt (or every 500 hours)

Date of Maintenance:______________  Hours:________ Performed by:_________________

• For warranty replacement or repair of diesel engine, contact Kubota Engine America Corporation directly. Refer to www.kubotaengine.com for a service location.
BEFORE OPERATION

• Safety Checklist
  o Read and understand the Operator’s Manual (located in the manual holder to the left of the seat).
  o Ensure that the machine is equipped with safety stops for the hopper lift cylinders and that all shields and guards are in place.
  o Check the seat belt to make sure it functions properly.
  o Know the location and function of all controls and how to stop quickly in an emergency.

  • Perform the daily maintenance checklist (For details, see the maintenance section of the Operator’s Manual).
    o Check for fluid leaks
    o Make sure radiator and oil cooler is clear of debris
    o Check air cleaner intake
    o Check all fluid levels
    o Check tire pressure
    o Grease all zerk (see operator’s manual for locations)
    o Check hydraulic filter indicator
    o Inspect blower liner
    o Check all engine screens to ensure proper air flow
• Adjust the rotor to the desired height. The height can be adjusted using the different mounting holes for the rotor bearings and by the roller located on the rear of the deck. The height can also be set by installing stops to the deck lift cylinders.

STARTING
• In order for the machine to start, the foot pedal must be in the neutral position, the operator must be in the seat, and the fan switch must be in the OFF position.
• Turn the key to the pre-heat position so that the light on the control arm becomes lit. Hold the key in that position until the light goes out. Then start the engine.
• The engine will shut down if the operator leaves the seat while the broom function is engaged.

DURING OPERATION
• FASTEN SEAT BELT
• To prevent possible eye injury, always wear SAFETY GLASSES while operating machine.
• Park Brake – Make sure the park brake is disengaged before operation. Set the park brake when unit is not in use or is parked on an incline. The indicator light illuminates when the park brake is set.
• HI/LO Speed – Always sweep/vacuum with transmission in low speed. Use high range when traveling between operations. The machine is equipped with an interlock that prevents the machine from reversing in high speed.
• Fan & Broom – Turn the fan and broom switches ON while the engine speed is at low to mid-throttle. Then operate at full throttle.
• Hopper Lift – The machine is equipped with an interlock that prevents the hopper from lifting if the machine is on a slope greater than 5°.
• Hopper Door – Hydraulically opened and closed with switch.
• Deck Lift – Hydraulically raised and lowered using the switch.
• Throttle – Start at low throttle. After allowing engine to warm up, operate machine at full throttle.