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| TROUBLESHOOTING CHECK LIST | EN-23 |
**SAFE OPERATION PRACTICES—RIDING VEHICLES**

**GENERAL**

1. This machine can amputate hands and feet and throw objects that can cause injury and damage. KNOW the controls and how to stop the machine quickly. READ THIS OPERATOR'S MANUAL and obey all safety messages appearing on the machine and in the operator's manual. LEARN from your operator's manual and from CAREFUL EXPERIENCE how to operate your equipment correctly. Know your machine's limitations.

2. Keep hands, feet, hair and loose clothing away from the attachment discharge area, the underside of the mower deck or any moving parts while the engine is running.

3. For your personal safety: Do not operate this machine while taking drugs or medication or while drinking alcoholic beverages.

4. Only responsible persons with mature judgment and proper physical capabilities should be allowed to operate this machine, and only after instruction in the correct use of this equipment.

5. Do not allow children to operate the machine.

6. Do not carry passengers.

7. The purpose of this machine is work. Do not use it for sport or recreation.

8. Do not mow when people or pets are in the area.

9. Clear the work area of objects (wire, rocks, etc.) that might be picked up and thrown.

10. Take all possible precautions when leaving the machine unattended, such as disengaging the power—take-off, lowering attachments, shifting into NEUTRAL, setting the parking brake, stopping the engine and removing the key.

11. Watch out for traffic when crossing or near roadways.

12. Stop and inspect the machine and attachments for damage after striking a foreign object. Damage should be repaired before restarting and operating the equipment.

13. Do not change the engine's governor settings or overspeed the engine.

14. Wear appropriate protective clothing when operating equipment. Long pants and substantial footwear, not bare feet or open sandals, are essential.

15. Do not operate the machine unless properly seated with your feet on the footrests or pedals.

16. Keep your eyes and mind on your machine, its attachment and the working area. Do not let other interests distract you.

17. Safety switch(es) stop or prevent engine starting to help prevent accidents. TAKE PRECAUTIONS—DON'T RELY ENTIRELY ON SAFETY SWITCH(ES).

18. Take care not to touch the equipment or attachment parts that may be hot from operation. The muffler and nearby areas may exceed 150°F. Let the engine and other parts cool before attempting to maintain, adjust or service them.

19. Stereo headphones, ear protection or other sound altering/dampening devices may limit your ability to hear warning sounds (horns, shouts, etc.).

**FUEL/FIRE PRECAUTIONS**

20. Handle gasoline with care—it is highly flammable.

21. Use an approved gas container. Place it out of children's reach.

22. Use gasoline only as a fuel—never as a cleaner.

23. Never remove the fuel cap or add gasoline to a running or hot engine, or an engine that has not cooled for several minutes after running.

24. Never fill the fuel tank indoors. Wipe up spilled gasoline.

25. Open doors if you run the engine in a garage—exhaust fumes are dangerous. Do not run the engine indoors.

26. Do not fill the machine with gasoline while smoking or when near an open flame or sparks.

27. Never store equipment with gasoline in the fuel tank inside a building where fumes may reach an open flame or spark.
SAFE OPERATION PRACTICES—RIDING VEHICLES

28. Allow the engine to cool before storing it in any enclosure.

29. To reduce fire hazard, keep the engine and attachments free of grass, leaves or excessive grease.

30. Battery acid is a poison and can cause burns. Avoid contact with skin, eyes and clothes and protect your face, eyes and clothing when working around the battery.

31. Battery gases can explode. Keep cigarettes, sparks and flames away from battery.

EQUIPMENT USE AND OPERATION

32. We recommend that you first operate the equipment at a slow speed with any attachment disengaged until you are thoroughly familiar with the controls and have developed operating skills.

33. Disengage all attachment clutches, set the parking brake and shift into NEUTRAL before starting the engine.

34. Disengage power to the attachment(s), set the parking brake and stop the engine before leaving the operator position.

35. Disengage power to the attachment(s) and stop the engine before making any repairs or adjustments.

36. Disengage power to the attachment(s) when transporting the machine or when it is not in use.

37. Disengage the attachment clutch before removing the mower from a hole or other obstruction.

38. Disengage power to the attachment(s) before backing. Do not mow in reverse unless it is absolutely necessary and then only after careful observation of the entire area behind the machine.

39. LOOK behind the machine to make sure the area is clear before placing the transmission in reverse and continue looking behind while backing.

40. Always back the machine up loading ramps and tilt bed trailers.

41. The parking brake is designed to hold the vehicle in place at rest, with the engine off. The parking brake will not restrain the vehicle with the engine running and the transmission engaged.

STABILITY/TIP OVER/TRACTION

42. Know the terrain on which you operate your equipment. There are areas on which you cannot safely operate your equipment.

43. Avoid operating the machine on hillsides, slopes or rough terrain. DO NOT operate the machine on hillsides or slopes exceeding 15° (27% grade). If safety is in doubt—STAY OFF THE SLOPE.

44. Reduce speed and exercise extreme caution on slopes above 10° (18% grade) to prevent tipping or loss of control. Never mow uphill on these slopes-mow downhill only. If you must climb a steep hill, back the machine up the hill, and drive the machine forward down the hill, keeping the vehicle in gear. If necessary to turn on hill, always turn downhill.

45. Mow up and down the face of slopes greater than 5° (9% grade), never across the face. Be especially cautious when changing directions on all slopes.

46. Operate your machine smoothly and at a ground speed slow enough to ensure complete control. Avoid erratic operation and excessive speed.

47. Sharp turns on any terrain may cause loss of control. Reduce speed and use caution on sharp turns.

48. Do not stop or start suddenly when going uphill or downhill. Avoid uphill starts. If machine stops when going up a slope, turn the attachment off and back slowly down the slope, keeping the machine in gear. Do not stop or change gears (speed) on slopes.

49. Know the terrain. Find hidden obstacles by walking through and inspecting the area before operating your equipment in that area. Plainly mark obstacles, such as rocks, roots or holes and stay well clear of these obstacles when operating.

50. While operating, stay alert for holes, rocks or roots, which may damage equipment or cause it to upset. Keep at least three (3) feet away from drop-offs, ditches, creeks, culverts, washouts and public highways.

51. Exercise care when mowing around a fixed object to prevent the equipment or attachment from striking it. When mowing, never deliberately run over any foreign object.

52. Areas wet with dew, rain or snow will be more slippery than when dry. Areas covered with loose gravel are more slippery than firm, dry ground. Greater stopping distances are required in these slippery areas.

53. Learn to expect changes in operating conditions. Adding or removing attachments or weight to your equipment will make your machine operate differently. Rain, snow, loose gravel, wet grass, etc., change the terrain’s tractive conditions. Changing tractive conditions require you to change your operating technique—including deciding not to operate on that terrain sometimes.
SAFE OPERATION PRACTICES—RIDING VEHICLES

54. Use care when pulling loads or using heavy equipment:
   A. Use only approved drawbar hitch points.
   B. Limit loads to those you can safely control.
   C. Do not turn sharply. Use care when backing.
   D. Use counterweight(s) or wheel weights when suggested in the operator's manual.

ATTACHMENT USE

55. When using attachments, never direct the discharge of material toward bystanders, nor allow anyone near the vehicle while it operates.

56. When using the machine with a mower:
   A. Mow only in daylight or in good artificial light.
   B. Never adjust cutting-height while the engine is running if you must dismount to do so.
   C. Shut off the engine when unclogging the chute.
   D. Check the blade mounting bolts for proper tightness at frequent intervals.

57. Keep hands and feet away from rotating blade(s) underneath the mower deck. Never place your foot on the ground when the mower is engaged or in motion.

58. DO NOT operate the mower attachment without the chute deflector or complete bagger in place.

59. Exercise care while maneuvering with the grass catcher. Front-to-rear stability may change.

60. If you use the machine with a snowthrower and the auger becomes plugged or jammed:
   A. Declutch the snowthrower and stop the vehicle engine immediately.
   B. Disconnect the spark plug wire(s).
   C. Clear snow from the discharge chute if it is plugged.
   D. If the auger is jammed, remove the foreign object and repair any damage to snowthrower before you continue.
   E. Reconnect the spark plug wire(s) and resume operation.

61. Never permit anyone to stand near the snowthrower auger or discharge opening. Objects may be present in snow, which when thrown, could cause injury.

62. When using snow/dozer blades:
   A. Do not hit solid objects. This can damage blades and injure the operator.
   B. Always travel at a safe, slow speed.

63. Keep all persons at safe distance away when operating tillers. Always disengage the PTO, lower the attachment and remove the ignition key before making any adjustments.

64. If the tiller starts to push the vehicle, disengage the PTO clutch immediately.

65. Use chains, counterweight(s) or wheel weights when necessary.

MAINTENANCE

66. Keep all nuts, bolts, fasteners and screws tight to ensure the equipment is in safe working condition and check them frequently. Repair or replace worn, damaged, distorted or broken parts as needed.

67. Keep the vehicle and its attachments in good operating condition and keep safety devices in place and working.

68. Under normal usage, the grass catcher bag's material will wear and deteriorate. Check often to see if the bag needs to be replaced.

69. Use only genuine Toro Wheel Horse replacement parts to maintain original standards.

70. Shields, deflectors, switches, blade controls and other safety devices must be in their proper position and functional.

71. Do not operate without a muffler or damper on the exhaust system. Damaged mufflers or spark arresters can create a fire hazard. Periodically inspect and replace whenever necessary.

72. If the equipment begins to vibrate abnormally, disengage power to the attachments and stop the engine immediately. Repair any damage before starting or continuing operation.

73. Periodically inspect all shafts, levers, friction devices and other moving parts that are subject to wear. Adjust or replace these parts if they are damaged, distorted or broken, or when wear affects the normal operation of the vehicle or attachment. DO NOT use equipment that is not operating properly.
## TRACTOR SPECIFICATIONS

### ENGINE:

<table>
<thead>
<tr>
<th>MACHINE MODEL</th>
<th>ENGINE MODEL*</th>
<th>RATED H.P.**</th>
<th>DISPLACEMENT cu.in./cc</th>
<th>BORE In./mm</th>
<th>STROKE In./mm</th>
<th>IGNITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>520-H</td>
<td>P220-G-I/10955C</td>
<td>20</td>
<td>47.7/782</td>
<td>3.25/82.6</td>
<td>2.88/73</td>
<td>Electronic</td>
</tr>
</tbody>
</table>

* P = Onan. Basic engine model number shown; specification and serial numbers from engine I.D. plate are required to identify the engine.

** Engine manufacturer's rating at 3600 RPM.

### TRANSMISSION: AUTOMATIC (HYDROSTATIC)

<table>
<thead>
<tr>
<th>GEAR</th>
<th>APPROXIMATE GROUND SPEEDS (at full throttle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td>Variable 0–5.0 mph (0–9.0 kmh)</td>
</tr>
<tr>
<td>Reverse</td>
<td>Variable 0–3.1 mph (0–5.5 kmh)</td>
</tr>
</tbody>
</table>

### ELECTRICAL SYSTEM:

- **Type**: 12 Volt D.C., Negative Ground
- **Battery**: 12 Volt, 280 CCA
- **Alternator**: 12 Volt, 20 amp Regulated

### TIRES:

<table>
<thead>
<tr>
<th>SIZE – FRONT</th>
<th>SIZE – REAR</th>
<th>PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 x 650–8</td>
<td>23 x 9.50–12</td>
<td>12 psi (0.85 kg/cm²)</td>
</tr>
</tbody>
</table>

### PHYSICAL DATA:

<table>
<thead>
<tr>
<th>HEIGHT in./cm/cm</th>
<th>LENGTH in./cm</th>
<th>WIDTH in./cm</th>
<th>WHEEL BASE in./cm</th>
<th>INSIDE TURNING RADIUS in./cm</th>
<th>NET WEIGHT (APPROXIMATE) lbs/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.5/120.7</td>
<td>65.0/165.1</td>
<td>36.5/92.7</td>
<td>45.5/115.6</td>
<td>36/91.4</td>
<td>646 /241</td>
</tr>
</tbody>
</table>

### TUNE-UP AND MAINTENANCE SPECIFICATIONS:

<table>
<thead>
<tr>
<th>POINT GAP IN./mm</th>
<th>TIMING MARK LOCATION</th>
<th>IGNITION SPARK PLUG GAP IN./mm</th>
<th>SPARK PLUG TYPE*</th>
<th>DIRECTION OF ROTATION (FAC, DR.P)</th>
<th>IDLE RPM (NO LOAD)</th>
<th>GOVERNED MAX. RPM (NO LOAD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Fixed RH14YC</td>
<td>.025/0.64</td>
<td>Counterclockwise</td>
<td>1400</td>
<td>2800</td>
</tr>
</tbody>
</table>

* Or equivalent (Champion number shown)

### LIQUID CAPACITIES:

<table>
<thead>
<tr>
<th>CRANKCASE</th>
<th>FUEL TANK</th>
<th>CHASSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7 qts (1.61 l) w/Filter</td>
<td>9 qts (8.5 l)</td>
<td>Zerk Fittings: 7</td>
</tr>
</tbody>
</table>
MODEL AND SERIAL NUMBER LOCATIONS

Model and serial numbers identify your new tractor and major attachments. Always refer to these numbers when consulting your dealer or factory about service, parts, or other information. If the plates showing the model and serial numbers are removed during repair operations, they should always be replaced.

The tractor vehicle identification number plate is just below the seat on the rear fender. The engine identification numbers are on the engine shrouding and show your tractor’s model, specification or type number and the serial number of the tractor’s engine. Major attachments also have a vehicle identification number plate attached to them.

For your convenience and ready reference, enter the tractor and engine numbers below.

Model and Serial Number Plate Location

1. Model and serial number plate

<table>
<thead>
<tr>
<th>Tractor Model and Serial Number</th>
<th>Engine Identification Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
<td>Model ______________________</td>
</tr>
<tr>
<td>SERIAL</td>
<td>Type or Spec. No. __________________</td>
</tr>
<tr>
<td>TORO Wheel Horse</td>
<td>Serial No. __________________</td>
</tr>
<tr>
<td>515 WEST IRELAND ROAD</td>
<td></td>
</tr>
<tr>
<td>SOUTH BEND, INDIANA 46314 USA</td>
<td></td>
</tr>
</tbody>
</table>

OWNER REGISTRATION AND WARRANTY

Service and warranty assurance is as important to TORO Wheel Horse as it is to you. To simplify warranty service at an Authorized TORO Wheel Horse Dealer, TORO Wheel Horse requires factory registration. We supply a registration card with each new tractor and attachment. Either you or your dealer must supply the required information and mail the card to TORO Wheel Horse.

The TORO Wheel Horse Limited Warranty Statement is on a “hang tag” attached to each product. This statement describes the items covered by the TORO Wheel Horse Limited Warranty, your rights and obligations, and the procedure for obtaining warranty service. Please familiarize yourself with the warranty statement. All of us at TORO Wheel Horse want you to be satisfied with your TORO Wheel Horse tractor; please don’t hesitate to contact us for assistance.
1. LIGHT SWITCH

The lights work only when the ignition switch is in the RUN position. Push on the top of the switch to turn on the lights. Push on the bottom of the switch to turn off the lights.

2. INDICATOR LIGHTS

When the ignition switch is turned to the ON position, all lights will come on automatically to check lights and electrical circuits. The lights will stay on momentarily and then go out.

All indicator lights must be OFF during operation; if an indicator light is on, there is a malfunction that must be corrected.

When the "AIR FILTER" light comes on, service the precleaner and air cleaner.

The "SEAT SWITCH" light comes on when the seat is unoccupied with the ignition switch in the RUN or START position.

If the "PTO LEVER" light is on when you try to start the engine, check that the PTO control lever is in the correct position for starting.

If the "MOTION LEVER" light is on during starting, check that the control lever is in the correct position for starting.

The "HYDRO TEMP" light senses the automatic transmission and transaxle oil temperature. If the light comes on, clean the transmission fins and check the cooling fan.

The "OIL PRESS" light measures engine oil pressure. This light flashes before the engine is started and goes out during normal operation. If it flashes during operation, it warns of an oil pressure malfunction. Stop the engine immediately and contact your Authorized TORO Wheel Horse Dealer for service.

The "PARK BRAKE" light comes on when you set the parking brake lock with the ignition switch in the RUN position.

The "ENG TEMP" light senses the cylinder head temperature. If the light comes on, clean the engine fins.

3. VOLTMETER

This gauge shows the electrical system battery voltage. When you turn the ignition key to RUN, the gauge should read 12 volts or slightly higher. After the engine starts, the gauge should read between 12 and 15 volts. If the gauge reads less than 12 volts, the battery is discharging. If the gauge reads 15 volts for long periods of time, check the battery water more often.
INSTRUMENTS AND CONTROLS

4. HORSEPOWER %
This gauge measures the load applied to the engine. As the load increases, the gauge reading will increase. The gauge should read between 25 and 75 for normal operation. With the engine running at full throttle, the load should be reasonably heavy for the first 25 hours of operation of seat the piston rings.

5. FUEL GAUGE
This gauge shows the fuel level in the fuel tank. Refill the tank with fuel as the gauge approaches the “E” marking.

6. TACHOMETER
This gauge measures engine revolutions per minute (rpm). The gauge is actuated only when the ignition switch is in the RUN position. With the engine running at full throttle and no load, the gauge should read as described in the Specifications section of this manual. If the gauge reads less than specifications, contact your Authorized Toro Wheel Horse Dealer for service.

7. HOUR METER
This gauge records the tractor’s operating hours. It switches on when the ignition switch is in the RUN position.

8. PTO (POWER TAKE-OFF) CLUTCH LEVER
The PTO lever engages and disengages the power-driven attachments. Push the lever forward to engage an attachment. Pull the lever back to disengage an attachment.

The PTO clutch lever actuates a safety interlock switch in the starter circuit. The indicator light comes on and the tractor will not start unless the lever is in the DISENGAGED position. If you leave the operator’s seat while the PTO is engaged, the seat switch indicator light comes on and the seat switch automatically shuts off the engine.

9. THE MOTION CONTROL LEVER
This lever must be the NEUTRAL position to actuate a safety interlock switch that will allow you to start the engine. The indicator light will come on if the safety interlock switch is not actuated when ignition switch is in the START position.

Move the motion control lever all the way to the right and push it ahead to move the tractor forward; pull the lever back to NEUTRAL to stop. Push the lever down and pull it back to move the tractor in reverse.

The motion control lever varies the ground speed and pulling power of the tractor independently from the engine speed. To increase the ground speed, move the lever away from NEUTRAL. Increase pulling power by moving the lever toward NEUTRAL.

10. THE PARKING BRAKE LOCK LEVER
To engage the parking brake, first press the foot brake pedal firmly, then move the parking brake lock lever back to lock the brake. To release the parking brake, push down on the foot brake pedal. (The parking brake lock lever is spring loaded and will return to the disengaged position when you press the foot brake pedal.) The indicator light is on when the parking brake is locked with the ignition switch in the RUN position.

11. THROTTLE CONTROL
The throttle lever controls the engine speed. Raise the lever to operate the tractor; lower the lever before shutting off the engine.

12. THE IGNITION SWITCH
The ignition switch has three positions from the left to the right: (1) OFF, (2) RUN, (3) START. To start the engine, turn the key all the way to the right to START. Release the key when the engine starts; it will automatically return to RUN. When you turn the switch to OFF, the engine stops and all electrical accessories are turned off.

13. THE CHOKE CONTROL
Raise the choke knob up when starting the engine. Slowly lower the knob after the engine starts. If the engine is already warm, choking may not be necessary to restart the engine.

14. HYDRAULIC ATTACHMENT LIFT LEVER
Pull the lever back to lift an attachment. Release the lever to hold an attachment in position. Push the lever forward to lower an attachment. The NEUTRAL position will hold an attachment at any “up” or “down” position. Always lower attachments before leaving the tractor unattended.

15. BRAKE/RETURN TO NEUTRAL PEDAL
This pedal provides braking to both rear wheels through the automatic transmission. As you depress the pedal, the transmission is shifted to NEUTRAL. When the pedal is fully depressed, a mechanical brake is also applied for additional braking action.

16. FUEL SHUT-OFF VALVE
(Not shown) This valve is on the bottom of the fuel tank under the rear fender. Normally it is left open, except when service on the fuel system becomes necessary.
### BEFORE OPERATING

#### CHECK THE OIL

Check the oil level before each use. The engine is equipped with a low-oil pressure switch. The engine will start and run when the light flashes and oil pressure is low. However, if the light does flash during operation, stop the engine immediately and contact your authorized TORO Wheel Horse dealer.

Information about recommended oils and how to check the oil level is in the Maintenance section of this manual.

#### CHECK THE FUEL

THE TORO COMPANY STRONGLY RECOMMENDS USING ONLY FRESH, CLEAN UNLEADED REGULAR GRADE GASOLINE. UNLEADED GASOLINE BURNS CLEANER, EXTENDS ENGINE LIFE AND PROMOTES GOOD STARTING BY REDUCING FORMATIONS OF COMBUSTION CHAMBER DEPOSITS. IF UNLEADED GASOLINE IS NOT AVAILABLE, LEADED CAN BE USED. NEVER USE METHANOL, GASOLINE CONTAINING METHANOL OR MORE THAN 10% ETHANOL, GASOLINE ADDITIVES, PREMIUM GASOLINE OR WHITE GAS BECAUSE THE ENGINE FUEL SYSTEM MAY BE DAMAGED. ALSO, DO NOT USE GASOLINE DE-ICERS. THEY CAN CAUSE INTERNAL DAMAGE TO CARBURETOR AND FUEL PUMP PARTS.

If you use regular leaded gasoline continually, you should remove carbon and lead deposits from the cylinder heads as required because of engine power loss. You can safely use unleaded gasoline after the lead deposits have been removed.

---

### DANGER

- Gasoline is highly flammable, use caution when storing or handling it.
- Do not fill the fuel tank while the engine is running, hot, or when the machine is in an enclosed area. Vapors may build up and be ignited by a spark or flame source many meters (feet) away.
- **DO NOT SMOKE** while filling the tank.
- Always fill the fuel tank outside and wipe up any spilled fuel before starting the engine.
- To prevent spilling fuel, use a funnel or spout and fill the tank to about 25 mm (1 in.) below the filler hole. **DO NOT OVERFILL.**
- Use gasoline for the engine only, not for any other purpose.
- Store gasoline in a clean, safety approved container and keep the container capped.
- Keep gasoline in a cool, well-ventilated place. Never store gasoline in an enclosed area such as a hot storage shed.
- **Never buy more than 30 days’ supply to assure volatility.**
- Because many children like the smell of gasoline, keep it out of their reach because the fumes are explosive and dangerous to inhale.
OPERATING YOUR TRACTOR

CHECK THE SAFETY INTERLOCK SYSTEM

The safety interlock system incorporates three switches for safe starting.

These starting switches are actuated by the motion control lever, the PTO clutch control and the seat. If the tractor won’t start, check whether the seat is occupied, the PTO clutch is disengaged and the motion control lever is in the NEUTRAL position. The indicator lights will be on and the engine will not start unless all three switches are actuated.

This switch shuts off the engine when you rise off the seat while the PTO is engaged.

Test the safety interlock system periodically. To test it, observe the following functions. (For your protection, if you do not get the results described, immediate repairs must be done by an Authorized TORO Wheel Horse dealer.)

1. The engine should NOT start if:
   A. The motion control lever is in the FORWARD or REVERSE position.
   B. The PTO is not disengaged.

Test each, one at a time.

2. With the engine running, test the operator seat switch by engaging the PTO and rising off the seat. The engine should shut off.

ADJUSTING THE SEAT

For adjustment, loosen the bolts under the seat, slide the seat to the desired position and retighten the bolts. Use the seat slide lever for further adjustment.

THE PARKING BRAKE

The parking brake should be set every time the tractor is vacated. To set the parking brake, depress the foot pedal and lift up on the parking brake release lever. Hold the release lever up and release the foot pedal to set the parking brake. To release the parking brake, push on the foot pedal and then release it.

STARTING THE ENGINE

CAUTION

Before starting the engine, become familiar with all controls. Read this manual thoroughly. Also, always check the engine's oil level before starting.

WARNING

Take care to avoid inhaling exhaust gases because they contain carbon monoxide gas, which is colorless and odorless. Carbon monoxide is a dangerous gas that can cause unconsciousness and death. Do NOT run the engine in confined areas such as a closed garage.

Your tractor will not start until the motion control lever is in the NEUTRAL position, the PTO is disengaged and the seat is occupied. The indicator light(s) will glow if the controls are not in the correct position for starting.
OPERATING YOUR TRACTOR

To start the engine, position the motion control lever in NEUTRAL and disengage the PTO. Move the throttle control lever to the SLOW position. Raise the choke control all the way to the COLD position.

Turn the ignition key clockwise until the starter engages. When the engine starts, release the key. The switch is spring loaded and will return to RUN automatically.

IMPORTANT: If the engine fails to start after 30 seconds of continuous cranking, turn the key to OFF and allow the starter motor to cool. Check for the cause of hard starting; consult the Troubleshooting Check List.

After the engine starts, move the throttle to half position and slowly return the choke control to its normal position. If the engine stalls at low speeds or hesitates during acceleration, use the choke until the engine reaches normal operating temperature.

(The choke controls a “butterfly” valve in the carburetor. When the choke is partially or completely closed, less air is admitted to the engine, resulting in a higher fuel-to-air (richer) mixture that is easier to ignite when the engine is cold. Choking the engine is needed if it is started cold. Warm engines may not need choking.)

When starting the engine during cold weather, follow the special procedures for warming the engine and transmission described under “Operating the Automatic Transmission.”

USING THE THROTTLE CONTROL

The throttle control regulates the engine speed as measured in RPM (Revolutions Per Minute). This control should not be used to regulate the tractor’s ground speed.

Always operate the tractor with the throttle control set at full speed. The engine has a special governor that limits maximum RPM. This allows the engine to operate most efficiently at a set speed and protects it from damage caused by excessive RPM.

IMPORTANT: The engine must operate at full throttle whenever you use the tractor. Operating at less than full throttle may result in extensive transmission damage and poor tractor performance.

GOING FORWARD OR BACKWARD

IMPORTANT: During cold weather, start the engine with the parking brake engaged and allow the transmission to run in NEUTRAL for 5 minutes before setting the unit into motion. For temperatures below 0°F (~18°C), allow the transmission to run in neutral for 10 minutes before beginning motion. Failure to do so may result in extensive transmission damage.

To Go Forward

⚠️ CAUTION

Before the tractor will move forward or backward, the parking brake must be disengaged. ALWAYS depress the brake/return to neutral pedal when disengaging parking brake.

A single “Motion Control Lever” controls your tractor’s motion. To go forward, move the lever forward. The farther forward you push the lever, the faster the tractor will go.

⚠️ CAUTION

For safe operating, never move the motion control lever too rapidly, especially on grades.

By adjusting the motion control lever, you can regulate the tractor’s forward speed without adjusting the throttle control. For heavy pulling, moving the control lever toward NEUTRAL reduces the tractor ground speed and increases pulling power, just as shifting to a lower gear does with a mechanical transmission.

To Go Backward

To go backward, return the motion control lever to NEUTRAL and pull the lever back. The farther back you pull the lever, the faster the tractor will go in reverse.

⚠️ CAUTION

For safety, never move the motion control lever too rapidly, especially on grades.

By adjusting the motion control lever, you can regulate the tractor’s reverse speed without adjusting the engine throttle control.
OPERATING YOUR TRACTOR

STOPPING
You can stop the tractor by one of two methods:

1. Return the motion control lever to its NEUTRAL position.

2. Press the brake pedal.

Pressing the brake pedal automatically returns the motion control lever to its NEUTRAL position and applies a mechanical brake. The brake pedal will hold the motion-control lever in NEUTRAL. (The pedal must be released before you can move the motion control lever either forward or backward.)

Tractors are free to roll (at a very slow speed) when the transmission is in NEUTRAL. Therefore, always depress brake pedal when the tractor is stopped on unlevel terrain.

SHUTTING OFF THE ENGINE
To shut off the engine, return the throttle lever to the idle position and turn the ignition key to OFF. If the engine has been working hard or is hot, allow it to idle a short time before turning off the key. This will help cool the engine before stopping.

Note: In an emergency, the engine may be stopped by turning the ignition key to the OFF position.

![CAUTION]

Always remove the key and set the parking brake when leaving the tractor unattended, even if just for a few minutes. Prevent accidents; don't give children or unauthorized persons an opportunity to operate this machine.

HAND Pushing THE TRACTOR

IMPORTANT: Hand push the tractor only—do not tow. Towing can damage the hydrostatic transmission severely.

Automatic transmission tractors can be pushed at a slow speed. To do this, move the motion control lever fully forward; the tractor will then move when pushed.
CAUTION

Read manuals provided with attachments before using them. These manuals give a more detailed description of operation and stress other areas of caution. Familiarize yourself thoroughly with your equipment before using it.

ATTACHMENT MOUNTING HITCHES

Attach-a-matic front and mid hitches provide easy attachment installation and removal without tools.

Rear-mounted attachments are secured to the tractor’s rear drawbar hitch, or to a special hitch supplied with the attachment or available as optional equipment.

To install attachments, make sure the hitch latch is in the released position:

- Push in the lock release pin; move the latch lever so the latch is open and release the lock pin to hold the latch in the open position.
- Insert and center the attachment shaft in the hitch slots and move the latch toward the closed position until the release pin snaps outward.

Remove attachments by pushing in the lock release pin, which allows you to move the latch to the open position.

Note: For specific installation and removal instructions, refer to attachment instructions.

ATTACHMENT BELTS

1. Remove the hairpin cotter from the trunnion and remove the trunnion from the top plate.
2. Remove the locking pin from the clutch shaft and clevis.
3. Move the top plate forward and remove the large hairpin cotter at the bottom of the rod housing. Slide the rod housing down and out of the top plate.
4. Remove the belt from the PTO pulley. If the tractor is to be operated without an attachment, reassemble the PTO linkage.
5. Install the belt in the inner groove of the PTO pulley for the mower and tiller. Install the belt in the outer groove for the Snowthrower, Lawn Vac, Generator and Loader.
6. Move the top plate forward, insert the top end of the rod housing in the hole in the top plate and install the large hairpin cotter in the bottom of the rod housing. Move the top plate rearward. Line up the clevis with the hole in the clutch shaft and install the locking pin.
7. Insert the trunnion in the top plate and secure it with a hairpin cotter.

![Power Take-Off (PTO)](image)

Front and Mid Attachment Hitches

1. Front latch lever
2. Lock release
3. Front hitch slot
4. Mid hitch slot
5. Latch handle

1. Hairpin cotter
2. Locking pin
3. Rod housing
4. Top plate
5. Clevis
6. Top plate
7. Hairpin cotter
USING YOUR TRACTOR WITH ATTACHMENTS

For best operation on average lawns, operate the engine at full throttle while controlling the ground speed with the transmission. Operate the tractor at 2 to 3.5 MPH (3.2 to 5.6 KMH)* while mowing grass. Uneven cutting is often a result of excessive ground speed. To eliminated uneven cutting, reduce ground speed.

Usually lawns are cut at heights between 2 and 3 in. (5 – 7.6 cm). Tall grass and weeds should be cut with the mower at its highest position, making a second-pass cutting at the height desired.

Always keep the mower blades sharp.

CAUTION
Sharp edges or mower blades can cut you during blade maintenance or adjustment. Use a suitable covering over the blade’s cutting edges to prevent bodily harm.

USING A SNOWTHROWER

CAUTION
Thoroughly inspect the area where you will use the snow thrower. Remove all door mats, sleds, boards and other foreign objects. Never make any adjustments while the engine is running. Never try to clear the chute while the engine is running.

Snow removal operation will vary greatly with the condition of each snowfall. Light fluffy snow can be cleared with ease. Clearing heavy wet snow may be more difficult. Coating the auger and chute with a light coat of wax or paraffin will help keep snow from sticking. Best results usually occur when the tractor ground speed is set at 1 to 2 mph (1.6 to 3.2 kmh.)

Note: Average walking speed is 3.5 mph (4 kmh).

Note: Inflating the front tires to 20 psi (138 kPa) for use with the two-stage snow thrower.

Exercise care whenever using the snow thrower. The auger can pick up sticks, stones and other foreign objects and throw them with great velocity. Always aim the discharge chute away from persons or objects that might be harmed.

Tire chains and wheel weights are recommended when using a snow thrower.

USING A MOWER

WARNING
Keep all shields and the mower discharge chute in place. Never put your hands or feet under the mower deck. Never attempt to clear discharge areas or mower blades without disengaging the PTO clutch and removing the ignition key.
USING YOUR TRACTOR WITH ATTACHMENTS

USING A SNOW, DOZER OR GRADER BLADE

Although the front-end dozer blade is usually used for snow removal, it can also be used for moving dirt, sand or gravel. Be careful and maintain a slow ground speed whenever you use the blade. Striking a solid object could injure you and damage the blade.

Grader blades are usually preferred for leveling sand, dirt or gravel. Using these blades is similar to using a dozer blade. Rear-mount grader blades may require special hitches; consult your dealer for the proper hitch(es) for your tractor.

USING A TILLER

The TORO Wheel Horse tiller does an excellent job of preparing gardens for planting.

Exercise caution when tilling virgin ground or clay because the tiller may have a tendency to push the tractor. You can correct this by raising the tiller with the attachment lift so the tiller penetrates only the very top of the soil. You can then lower the tiller to its full depth on later passes. Cleat tires will reduce the tiller's pushing effect.

| CAUTION |
| If the tiller starts to push the tractor, shut the tiller off immediately by disengaging the PTO clutch. |

Slowing the tractor’s ground speed will improve the tiller's aggressive action. Best results usually occur with a tractor ground speed of less than 1.0 mph (1.6 km/h).

Note: Average walking speed is 2.5 mph (4 km/h).

Do not over-till soil. Soil tilled excessively will not hold water and will compact easily.

USING A PLOW, DISC, CULTIVATOR OR HARIOW

Plows and discs require maximum tractor efficiency. Cleat tires, or tire chains, and wheel weights increase rear tire traction. Front-wheel weights increase steering control.

Some attachments require special rear hitches. Consult your dealer for proper hitch(es) required for your tractor.

There are two methods of preparing a seed bed for planting.

1. Use a tiller, which will prepare the soil in one operation.

2. Use a plow to turn ground, a disc to break up large clumps, and a harrow to pulverize and smooth soil.

Plows are classified by the width of the furrow they turn. Generally, plows are set to cut 4 to 6 in. (10–15.2 cm) deep.

A disc is used immediately after plowing. The disc will break up large clumps of soil.

After discing, a spike-tooth harrow is usually dragged over soil. The harrow helps pulverize the soil and levels the seed bed. The soil should now be ready for planting.

A cultivator is used during growing season to help remove unwanted weeds and to help aerate plant roots. Consider the cultivator’s width before planting the seed bed to ensure the cultivator will fit between rows without damaging crop roots.

USING OTHER ATTACHMENTS

Many other special-purpose attachments are available that greatly increase the tractor’s versatility. An attachment can be a completely self-contained system (front bucket loader), one that is used with another attachment (lawn vacuum), or one intended for operator comfort (snow cab).

Some attachments are powered by a separate gasoline engine, some are ground driven and some are simply towed, such as a dump cart.

All attachments should be approached with the same caution given any mechanical device. Always read each Operating Instruction Manual carefully before using the attachment. Keep children and pets away from the vehicle when it is operating. Never allow any unauthorized personnel to operate the equipment.

Your authorized TORO Wheel Horse dealer can help you with selecting attachments for use with your tractor.

DUMP CART LOAD LIMITS

Observe the following load limits when using the tractor with a dump cart. Load limits have been set to provide for safe braking on slopes.

275 lbs (127 kg)
# MAINTENANCE

## CAUTION

To minimize chance of injury, do all maintenance and adjustments on your tractor with the engine off and the ignition key removed, unless instructed otherwise. Use extreme care when working near operating machinery. Do not wear loose fitting clothing. Remove your watch and any jewelry before beginning work and observe common safety practices when using tools.

## MAINTENANCE CHECK LIST

**Note:** Service intervals shown are considered maximum intervals under normal operating conditions. Increase frequency under extremely dirty or dusty conditions.

<table>
<thead>
<tr>
<th>Service Operation</th>
<th>Before Each Use</th>
<th>After Each Use</th>
<th>Every 25 Hours</th>
<th>Every 50 Hours</th>
<th>Every 100 Hours</th>
<th>Every 200 Hours</th>
<th>Every 1000 Hours</th>
</tr>
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<tbody>
<tr>
<td><strong>Check:</strong></td>
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<td>Air Filter and PreCleaner</td>
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<td>Engine Chaff Screen</td>
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<td>Exterior and Fins</td>
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<td>Breather Valve and Baffle</td>
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<td>X</td>
<td></td>
</tr>
</tbody>
</table>

(1) Refer to text for initial service interval for new tractors.
ENGINE

COOLING
Check the chaff screen and the rotating screen behind the chaff screen on the engine each time you use the machine. Restricted air flow through the engine can cause overheating and engine damage.

OIL RECOMMENDATIONS
For maximum engine protection under all operating conditions, use API Service Classification SF oil.

Oil Level
IMPORTANT: Check the oil level of the engine every 8 hours or before each use. An improper oil level can cause extensive internal damage to the engine.

The oil filler dipstick and oil drain location for the engine are shown in the following illustrations.

To check the engine oil level, stop the tractor where the engine is level. Shut off the engine, set the parking brake, and remove the ignition key. Remove the oil dipstick from the engine.

CAUTION
Crankcase pressure can blow out hot oil and cause serious burns. Do NOT check oil when the engine is operating.

1. Correct Oil Level
Correct Oil Level

Wipe the dipstick with a clean lint-free cloth; insert it into the engine block as far as it will go. Remove dipstick again and read the scale on the lower portion of the stick.

Add oil through the dipstick tube.

IMPORTANT: Do not overfill the crankcase. Excess oil causes high oil consumption and oil accumulation in the air cleaner housing.

Oil Changes
Change the engine oil in your machine after first 25 hours of operation. After that, change the oil at 50 operating-hour intervals. Change the oil filter after every 100 hours. If operating conditions are extremely dusty or dirty, change the oil more often.

IMPORTANT: Failure to change the engine oil at recommended intervals can seriously damage the engine. Change the oil more often if you operate the machine in extremely dusty conditions.
MAINTENANCE

When replacing the oil filter, unscrew the used filter and install the new filter on the engine.

Remove the dipstick/oil fill cap and add about 80 percent of the oil specified in following chart. Also shown are charts for selecting the correct oil type and oil viscosity. When using the temperature viscosity chart, select the air temperature you will most likely encounter within the next 50 hours of operation.

<table>
<thead>
<tr>
<th>Engine Oil Type</th>
<th>Crankcase Oil Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>API Service SF or SF/CC</td>
<td>1.5 qts (1.4 l) without the filter</td>
</tr>
<tr>
<td></td>
<td>1.7 qts (1.6 l) with the filter</td>
</tr>
</tbody>
</table>

If the tractor has an AIR FILTER indicator light, clean the air filter and precleaner when the light comes on during operation.

If the engine does not have an AIR FILTER indicator light, clean the engine air filter and precleaner after every 25 hours of operation (more often if you operate the machine in extremely dusty conditions).

Replace air filter elements at 200-hour intervals. Replace them more often in dusty operating conditions. To protect your engine, use only the manufacturer’s replacement filter or replacement filters with equivalent specifications.

Check the following when installing a new or serviced element:

1. The base must be tightened securely to the carburetor. Replace the base if it is bent or cracked.
2. Gasket surfaces of the element must be flat against the base and cover to seal effectively.
3. Tighten screws securely.
4. Be sure cover seals and gaskets are in good condition and will seal properly. Bad gaskets and seals can let unfiltered air into the carburetor.

IMPORTANT: To prevent any dirt or other contaminants from entering the engine, always cover the carburetor air horn when you remove the air cleaner.

Engine Oil Temperature—Viscosity Chart

After adding 80 percent of the prescribed amount of oil, check the oil level. Add oil as necessary to bring it to the “Full” level.

IMPORTANT: Never overfill the engine crankcase with oil. The oil level must not exceed the “F” level on the dipstick.

CLEANING THE AIR FILTER

Dirt coming through improperly installed, poorly serviced, or inadequate air filter elements is very harmful to the engine. Also, a clogged element causes a richer fuel mixture, which wastes gasoline and may lead to formation of harmful sludge deposits.

Air Cleaner Assembly

1. Lower housing
2. Cover
3. Knob
4. Element
5. Pre-cleaner
6. Wing nut
7. Spacer
8. Deflector plate

EN-17
MAINTENANCE

Clean the dry-type air filter element by tapping it lightly on a flat surface to remove loose dirt particles. Replace the element if dirt does not drop off easily. DO NOT wash elements in liquid. Do not attempt to blow dirt off with compressed air because this can puncture the filter element.

Foam precleaners are used over the filter elements on the air cleaner. Clean the precleaner at 25-hour intervals, when servicing the air cleaner. Wash the precleaner in a solution of liquid dishwashing detergent and water. Squeeze out excess water and allow it to dry. Coat the precleaner evenly with two tablespoons of SAE 30 engine oil, kneading the oil into the precleaner. Wring out excess oil from the precleaner, then install the precleaner over the air cleaner element. In other words:

1. WASH
2. SQUEEZE DRY
3. COAT WITH OIL-WRING OUT EXCESS
4. INSTALL OVER PAPER ELEMENT

CRANKCASE BREATHER

The engine uses a crankcase breather valve and "Pack" for maintaining the crankcase vacuum. If the crankcase becomes pressurized as evidenced by oil leaks at the seals, clean the pack and valve screens in a suitable solvent. Check and clean the valve and baffle after every 1,000 hours of operation.

Crankcase Breather
1. Breather hose
2. Can and valve
3. Hose clamp
4. "O" ring
5. Clamp

6. Screen
7. Breather tube
8. Baffle
9. Screen

FUEL SYSTEM

Fuel Strainer
MAINTENANCE

Fuel Filter
A fine-mesh screen-type strainer, incorporated into the fitting at the bottom of the tank, and an in-line fuel filter both filter foreign matter from gasoline before it reaches the carburetor. This strainer and fuel filter normally require service only if the fuel becomes severely contaminated.

Always clean the area around the fuel cap before removing it to prevent dirt from entering fuel system. Also, ensure that the fuel storage container you use is clean and in good condition.

Keep the fuel tank full during winter operation. Cold and damp weather conditions can cause moisture to condense in the tank.

THE EXHAUST SYSTEM
Make regular visible and audible inspections of the exhaust system throughout the tractor's life. Locate leaks in the muffler and piping while the engine is operating. For personal safety, repair all leaks immediately after you detect them.

⚠️ CAUTION

Inhaling exhaust gases can result in serious personal injury or death. Inspect the exhaust system for leaks daily. Repair any leaks immediately.

THE ELECTRICAL SYSTEM

Main Fuse
A 15-amp automotive-type ATO or ATC fuse protects the main circuit of the electrical system.

Charge Circuit Fuse Location

Light Circuit Fuse
The lights’ circuit is powered by the battery. The lights will operate when the ignition switch is in the RUN position. A 10-amp automotive-type ATO or ATC fuse is part of the light circuit.

Gauge Circuit Fuse
The gauge circuits are protected by the light circuit’s 10-amp automotive-type ATO or ATC fuse.

Battery

IMPORTANT: When servicing the battery or any other part of the electrical system, or if the battery must be removed for any reason, always disconnect the negative (ground) cable FIRST and reconnect it LAST to avoid electrical shorts.

IMPORTANT: At temperatures below 32° F (0° C), a full charge state must be maintained to prevent cell electrolyte from freezing and causing permanent battery damage.
THE AUTOMATIC TRANSMISSION

Transmission Oil Quality

The hydrostatic transmission requires 10W-30 or 10W-40 premium quality motor oil.

Transmission Oil Level

Automatic Transmission Dipstick

Check the lubricant level before each use. The automatic transmission dipstick is in a filler tube coming up from the transmission. The dipstick is marked for COLD oil. Remove the dipstick and wipe it with a clean, lint-free rag. Replace the dipstick and remove it again. The oil level should be maintained between "F" and "L" levels on dipstick. Never operate the tractor with oil BELOW or ABOVE the marks on the dipstick. Add oil as necessary. Replace the dipstick, making sure it is fully seated in the filler tube.

IMPORTANT: Use care to prevent dirt, clippings or other foreign material from entering the transmission during oil level checks, oil fillings, or oil changes.

Transmission Oil Changes

Transaxle Drain Plug and Oil Filter

Drain and refill the transmission oil once per year or after 100 hours of operation, whichever occurs first.

Drain oil by removing the pipe plug at the bottom of the transaxle. The plug is near the left rear of the transaxle. Refill capacity is 5 quarts (4.7 liters). After adding 4 quarts of oil, check the oil level. Add oil to bring the level between the "F" and "L" markings on the dipstick.

Transmission Oil Filter

Replace the transmission oil filter after the first 10 hours of operation. After that, replace the filter with each transmission oil change (100 hours or one year, whichever occurs first).
CHASSIS LUBRICATION

The steering gear, foot pedal, spindles, front wheel bearings, and front axle pivot have fittings to simplify lubrication with a pressure grease gun. Before using a grease gun, clean the zerk fittings carefully to prevent dirt from being forced into the fitting. After greasing, wipe off any excess grease. Use a general purpose grease (lithium base) to lubricate the tractor.

Front Wheel, Spindle, and Front Axle Lube Fittings

Lubricate the chassis after each 25 hours of operation. All other pivoting arms and levers should be lubricated at the same intervals with either general purpose grease or machine oil, applied directly to wear surfaces.

Steering Shaft Grease Fitting

FOOT BRAKE ADJUSTMENT

To adjust the brake, remove the left-hand side cover, which is secured by two screws at the top, one screw at the bottom and a bolt at the front.

1. Set the parking brake so the lever is latched in the second notch in the control cam. Do this by pulling back on parking brake lever as you slowly depress the brake pedal. You will feel the lever move back slightly as it drops into second notch of control cam.

2. Tighten the nut on the brake linkage bolt until the coils of heavy spring are compressed fully, then turn the nut back 1/2 turn.

3. Release the parking brake and check that the brake band is not dragging on the brake drum.

Steering Gear and Foot Pedal Lube Fitting

Brake Adjustment

If the tractor creeps after the brake pedal is depressed and then released, the linkage that returns the tractor to NEUTRAL needs adjustment. Your authorized dealer should do this.
PTO CLUTCH AND BRAKE ADJUSTMENT

The PTO clutch and brake may require periodic adjustment due to normal wear of the friction surfaces. If clutch slippage is apparent, turn the trunion farther onto the clutch rod in one-turn intervals until you eliminate the slippage.

To adjust the PTO:

1. Engage the PTO clutch.
2. Loosen the two bolts that hold brake pad bracket to the support bracket.
3. Place a .012 in. (0.3 mm) feeler gauge between the brake pad and the clutch pulley.
4. While holding the brake pad against the feeler gauge and pulley, tighten the two brake bracket bolts.

CLEANING AND STORAGE

The tractor should be washed regularly with a mild automotive detergent and water. After 30 days, painted surfaces may be waxed to protect original finish.

You can remove minor paint scratches or abrasions with an automotive cleaning and polishing compound. Rubbing compound is not recommended under normal circumstances because it is highly abrasive. Exposed bare metal surfaces should be given a light coating of oil or grease to prevent rust until permanent repairs can be made. Aerosol cans of TORO Wheel Horse paint are available through your Authorized TORO Wheel Horse dealer.

When the tractor will not be in use for an extended period, the following steps will help ensure minimum difficulty when unit returns to service:

1. Do the required maintenance steps described in the “Maintenance Check List.”
2. Check the tires for proper inflation.
3. Drain all fuel from the fuel tank. Start the tractor and let engine run out of gas. (As gasoline grows old, it becomes less volatile and forms harmful gums and varnish deposits in the carburetor and fuel pump.) DO NOT STORE GASOLINE FOR MORE THAN 2 MONTHS.
4. Wash the tractor and repaint all bare metal surfaces.
5. Charge the battery. In temperatures lower than 40° F (4° C), a battery will maintain a charge for about 60 days. In temperatures above 40° F (4° C), the water level should be checked and the battery “trickle charged” every 30 days (more often in higher temperature). The battery must be fully charged to prevent freezing and internal damage in weather below 32° F (0° C).
6. Remove the key from the tractor.
## TROUBLESHOOTING CHECK LIST

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Possible Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>The engine will not turn over.</td>
<td>Dead battery.</td>
<td>Charge or replace battery.</td>
</tr>
<tr>
<td></td>
<td>An open safety interlock switch.</td>
<td>Be sure the PTO is disengaged and the motion control lever is all the way</td>
</tr>
<tr>
<td></td>
<td></td>
<td>left in horizontal slot of shift plate.</td>
</tr>
<tr>
<td></td>
<td>Starter.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Solenoid.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Ignition switch.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td>The engine turns over but will not start.</td>
<td>Spark plug not firing.</td>
<td>Check spark plug condition and reset gap.</td>
</tr>
<tr>
<td></td>
<td>Ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>No fuel in tank.</td>
<td>Refuel the tractor.</td>
</tr>
<tr>
<td></td>
<td>Fuel valve closed.</td>
<td>Open fuel valve.</td>
</tr>
<tr>
<td></td>
<td>Improper carburetor adjustment.</td>
<td>Reset carburetor adjustment.</td>
</tr>
<tr>
<td></td>
<td>Ignition switch.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td>The engine is hard to start.</td>
<td>Spark plug wire(s) grounded or loose.</td>
<td>Check spark plug wires.</td>
</tr>
<tr>
<td></td>
<td>Ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Spark plug(s) faulty or improperly gapped.</td>
<td>Check spark plug condition and reset gap.</td>
</tr>
<tr>
<td></td>
<td>Fuel line clogged.</td>
<td>Clean fuel line and change line filter; check strainer in fuel tank.</td>
</tr>
<tr>
<td></td>
<td>Faulty fuel pump.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Carburetor dirty or improperly adjusted.</td>
<td>Readjust carburetor. Consult dealer for authorized carburetor service.</td>
</tr>
<tr>
<td>The engine starts, but operates erratically.</td>
<td>Clogged fuel line.</td>
<td>Clean fuel line; check strainer in fuel tank.</td>
</tr>
<tr>
<td></td>
<td>Water in fuel.</td>
<td>Drain old fuel and replace with fresh supply.</td>
</tr>
<tr>
<td></td>
<td>Vent in fuel cap plugged.</td>
<td>Check vent.</td>
</tr>
<tr>
<td></td>
<td>Ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Improper carburetor adjustment.</td>
<td>Readjust carburetor.</td>
</tr>
<tr>
<td>The engine knocks.</td>
<td>Fuel octane too low.</td>
<td>Drain fuel and replace with higher octane supply.</td>
</tr>
<tr>
<td></td>
<td>Faulty ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Incorrect carburetor adjustment.</td>
<td>Readjust carburetor.</td>
</tr>
<tr>
<td>The engine occasionally &quot;skips&quot; at high speed.</td>
<td>Spark plug(s) fouled, faulty or gap too wide.</td>
<td>Check spark plug condition and gap.</td>
</tr>
<tr>
<td></td>
<td>Faulty ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>Incorrect carburetor adjustment.</td>
<td>Readjust carburetor.</td>
</tr>
<tr>
<td>The engine overheating.</td>
<td>Air intake screen or fins clogged.</td>
<td>Clean the intake screen and fins.</td>
</tr>
<tr>
<td></td>
<td>Oil level too high or too low.</td>
<td>Adjust the oil level as necessary.</td>
</tr>
<tr>
<td></td>
<td>The fuel mixture is too lean.</td>
<td>Readjust the carburetor.</td>
</tr>
<tr>
<td></td>
<td>Faulty ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td></td>
<td>The engine overloaded.</td>
<td>Reduce the load on the tractor.</td>
</tr>
<tr>
<td>Symptom</td>
<td>Possible Cause</td>
<td>Possible Remedy</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The engine idles poorly.</td>
<td>Improper carburetor adjustment.</td>
<td>Readjust the carburetor.</td>
</tr>
<tr>
<td></td>
<td>Improper spark plug gap.</td>
<td>Check the condition and gap of spark plug(s).</td>
</tr>
<tr>
<td>The engine backfires.</td>
<td>Improper carburetor adjustment.</td>
<td>Readjust the carburetor.</td>
</tr>
<tr>
<td></td>
<td>Ignition system.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td>The engine runs fine, but the tractor will not move.</td>
<td>Transmission clutch disengaged.</td>
<td>Engage the clutch.</td>
</tr>
<tr>
<td></td>
<td>Faulty transmission.</td>
<td>Consult an authorized dealer.</td>
</tr>
<tr>
<td>The tractor loses power or the transmission overheats.</td>
<td>The transmission oil level too high or too low.</td>
<td>Adjust the oil level as necessary.</td>
</tr>
<tr>
<td>(Automatic models).</td>
<td>Transmission damage has resulted from operating the engine at low RPM or</td>
<td>Consult dealer for authorized service.</td>
</tr>
<tr>
<td></td>
<td>contamination of oil.</td>
<td></td>
</tr>
<tr>
<td>The engine stalls whenever the PTO is engaged.</td>
<td>Excessive load on PTO.</td>
<td>Check for jammed attachments.</td>
</tr>
<tr>
<td></td>
<td>Faulty interlock system.</td>
<td>Lessen load on attachment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The seat must be occupied to close the interlock system. Consult an authorized</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dealer.</td>
</tr>
</tbody>
</table>

