JACOBSEN®

OPERATOR'S MANUAL

T423D Turfcat®

2 Wheel Drive
Product No. 66136

4 Wheel Drive
2 Post ROPS
Product No. 66137

T428D Turfcat®

2 Wheel Drive
Product No. 66138

4 Wheel Drive
2 Post ROPS
Product No. 66139

T445G Turfcat®

2 Wheel Drive
Product No. 66140

Litho in U.S.A. 996

Part No. 3005749

***WARNING:** If incorrectly used this machine can cause severe injury. Those who use and maintain the machine should be trained in its proper use, warned of its dangers and should read the entire manual before attempting to set up, operate, adjust or service the machine.*

SAFE PRACTICES

1. Safety is dependent upon the awareness, concern and prudence of those who operate or service the equipment. Never allow minors to operate any equipment.
2. It is your responsibility to read this manual and all publications associated with this equipment (engine, accessories and attachments).
3. Learn the proper use of the machine, the location and purpose of all the controls and gauges before you operate the equipment. Working with unfamiliar equipment can lead to accidents

   ⚠ *The safety alert symbol is used to alert you to potential hazards.*

   DANGER *- Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

   WARNING *- Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

   CAUTION *- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and property damage. It may also be used to alert against unsafe practices.*
4. Never allow anyone to operate or service the machine or its attachments without proper training and instructions; or while under the influence of alcohol or drugs.
5. Wear all the necessary protective clothing and personal safety devices to protect your head, eyes, ears hands and feet. Operate the machine only in daylight or in good artificial light.
6. Inspect the area where the equipment will be used. Pick up all the debris you can find before operating. Beware of overhead obstructions (low tree limbs, electrical wires, etc.) and also underground obstacles (sprinklers, pipes, tree roots, etc.) Enter a new area caustiously. Stay alert for hidden hazards.
7. Never operate equipment that is not in perfect working order or without decals, guards shields or other protective devices securely fastened in place.
8. Never disconnect or bypass any switch.
9. Carbon monoxide in the exhaust fumes can be fatal when inhaled. Never operate the engine without proper ventilation.
10. Fuel is highly flammable, handle with care.
11. Keep the engine clean. Allow the engine to cool before storing and always remove the ignition key.
12. Disengage all drives and engage parking brake before starting the engine (motor). Start the engine only when sitting in operator's seat, never while standing beside the unit.
13. Equipment must comply with the latest federal, state, and local requirements when driven or transported on public roads.
14. Never use your hands to search for oil leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury.
15. Operate the machine up and down the face of the slopes (vertically), not across the face (horizontally). Keep vehicle in gear when descending slopes.
16. To prevent tipping or loss of control, do not start or stop suddenly; reduce speed when making sharp turns. Use caution when changing direction on slopes.
17. Always use the seat belt when operating tractors equipped with a ROPS.

    Never use a seat belt when operating a tractor without a ROPS.

⚠ WARNING

1. Before leaving the operator's position for any reason:
   a. Disengage all drives.
   b. Lower all implements to the ground.
   c. Engage parking brake.
   d. Stop engine and remove the ignition key.
2. Keep hands, feet, and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
3. Keep the area of operation clear of all bystanders.
4. Never carry passengers.
5. Never operate mowing equipment without the discharge deflector securely fastened in place.

FOREWORD

By following all the instructions in this manual, you will prolong the life of your equipment and maintain its maximum efficiency.

Adjustments and maintenance should always be performed by a qualified technician.

If additional information or service is needed, contact an Authorized Jacobsen Distributor who is kept informed of the latest methods to service this equipment and can provide prompt and efficient service.

Use of other than original Jacobsen parts and accessories or Jacobsen authorized parts and accessories will void the warranty.

Proposition 65 Warning

Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm.

All information in this publication is based on information available at time of approval for printing.

Jacobsen reserves the right to make changes at any time without notice and without incurring any obligation.

For pictorial clarity, some illustrations in this manual may show shields, guards or plates open or removed. Under no circumstances should this equipment be operated without these devices securely fastened in place.

⚠ WARNING

The operator back-up system on this tractor, prevents the engine from starting unless the PTO is disengaged and the transmission is in neutral. The system will stop the engine if the operator leaves the seat with the transmission or the PTO engaged.

To protect the operator and others from injury, never operate equipment with the interlock system disconnected or malfunctioning.

This machine is to be operated and maintained as specified in this manual and is intended for the professional maintenance of specialized turf grasses. It is not intended for use on rough terrain or long grasses.

CONTENTS

SPECIFICATIONS

1.0 PRODUCT IDENTIFICATION:

66136 .....Turfcat T423D - 23 hp Diesel engine, 2 Wheel Drive
66137 .....Turfcat T423D - 23 hp Diesel engine, 4 Wheel Drive with 2 Post ROPS
66138 .....Turfcat T428D - 28 hp Diesel engine, 2 Wheel Drive
66139 .....Turfcat T428D - 28 hp Diesel engine, 4 Wheel Drive with 2 Post ROPS
66140 .....Turfcat T445G - 28 hp Gasoline engine, 2 Wheel Drive

Product	EEC Sound Power	Sound Pressure Level Operator Ear	Vibration M/S^2	
			Arms	Body
66136 66137 66138 66139 66140	100 dba	88dba	3.78	1.37

1.1 ENGINE: Diesel

Air Cleaner .....Centrifugal with pre-cleaner.
Cooling System .....Pressurized, Sealed, 183°F (84°C) Thermostat, 6 Blade Fan.
Capacity .....1 Gallon (3.8 L).
Electrical System.....12 Volt - 40 amp Alternator/Regulator.
Engine for Product
66136 and 66137 .....Kubota D905E diesel, 4-cycle, 3-cylinder, Liquid Cooled.
Bore and Stroke .....2.83 x 2.90 in., (72 x 73.6 mm).
Compression Ratio ..22:1.
Displacement .....54.86 cu. in., (898 cc).
Horsepower .....22.5 HP @3000 RPM (17.1 kW).
Torque .....39.7 ft-lb. @2200 RPM (54 Nm).
Engine for Product
66138 and 66139 .....Kubota D1105E diesel, 4-cycle, 3-cylinder, Liquid Cooled.
Bore and Stroke .....3.07 x 3.09 in., (78 x 78.4 mm).
Compression Ratio ..22:1.
Displacement .....68.5 cu. in., (1123 cc).
Horsepower .....28 HP @3000 RPM (20.9 kW).
Torque .....54 ft-lb. @2200 RPM (73 Nm).
Fuel .....No. 2 diesel, minimum cetane 45.
Fuel Injection Pump .....Bosch MD Type.
Governor Type .....Centrifugal Flyweight - Mechanical.
High Idle .....3150 RPM ± 50.
Low Idle .....1750 RPM ± 100.
Lubrication.....Pressurized by Trochoid Pump.
Oil Capacity .....3.5 quarts (3.3 L).
Oil Filter .....Full Flow Oil Filter Cartridge.

1.2 ENGINE: Gasoline

Air Cleaner .....Centrifugal with pre-cleaner.
Cooling System .....Pressurized, Sealed, 160°F (71°C) Thermostat, 7 Blade Fan.
Capacity .....3.73 quarts (3.53 L)
Electrical System.....12 Volt - 40 amp Alternator/Regulator.
Engine .....VSG-411 Ford, 4-cycle, 4-cylinder, Liquid cooled.
Bore and Stroke .....2.911 x 2.558 in., (74 x 65 mm)
Compression Ratio ..9.5:1
Displacement .....67.0 cu. in., (1100cc)
Horsepower .....28 HP @3200 RPM (21 kW)
Torque .....60.0 ft-lb. @ 2600-3200 RPM (81.35 Nm)
Fuel .....Unleaded gasoline 87 Octane minimum
Governor Type .....Electronic (Barber-Colman)
Lubrication.....Full pressure w/full flow oil filter
Oil Capacity .....3.5 quarts (3.3 L).
Oil Filter .....Replaceable spin-on type

1.3 TRACTOR:

Transmission .....In Line Drive Shaft to Hydrostatic Transmission.
Differential .....Peerless 2-Speed Transaxle with High/ Low Range and Differential Lock (4 WD only).
Steering .....Hydrostatic Assist Power Steering.
Brake .....Pedal Operated Disk Brake on Transaxle with Parking Brake Latch.
Wheels .....Stamped Disk Rim.
Tires:
(2) Front .....23 x 10.50 - 12 Xtra-traction 2-Ply.
(2) Rear .....16 x 7.50 - 8 4 - Ply.
Hydraulic System .....(2 WD) Reservoir 4.5 Gal., (17 L). (4 WD) Reservoir and Transaxle 5.86 Gal., (22 Liter) 20-Micron Oil Filter.
Implement Lift.....Single 2 in., Bore Cylinder Controlled by 3 Position Valve.
P.T.O. Drive .....Fixed Flow, gear type hydraulic pump mounted on engine.
Fuel Tank .....High-Density Polyethylene; 8 Gallon Capacity (30.3 ltr).
Grounds Speed
Forward .....High: 0-10.5 mph (0-17.0 Km/h). Low: 0-6.5 mph (0-10.5 Km/h).
Reverse .....High: 0-4.4 mph (0-7.0 Km/H). Low: 0-3.0 mph (0-4.8 Km/H).

1.4 BATTERY:

12V battery, 250 cold cranking amps at 0°F (-18° C). AABM Group #22NF.

Continuous cold weather operation: 12V battery, 400 cold cranking amps at 0° F (-18° C). AABM group 45 GMP.

1.5 WEIGHTS AND DIMENSIONS: (Tractor Only)

	(inches)	(mm)
Length	89	(2261)
Overall Width	51.4	(1305)
Overall Height	61.0	(1550)
Wheel Base	53	(1346)
Ground Clearance	7	(178)
Shipping Weight (w/o ROPS)	1510 lb.,	(685 Kg)

1.6 ACCESSORIES

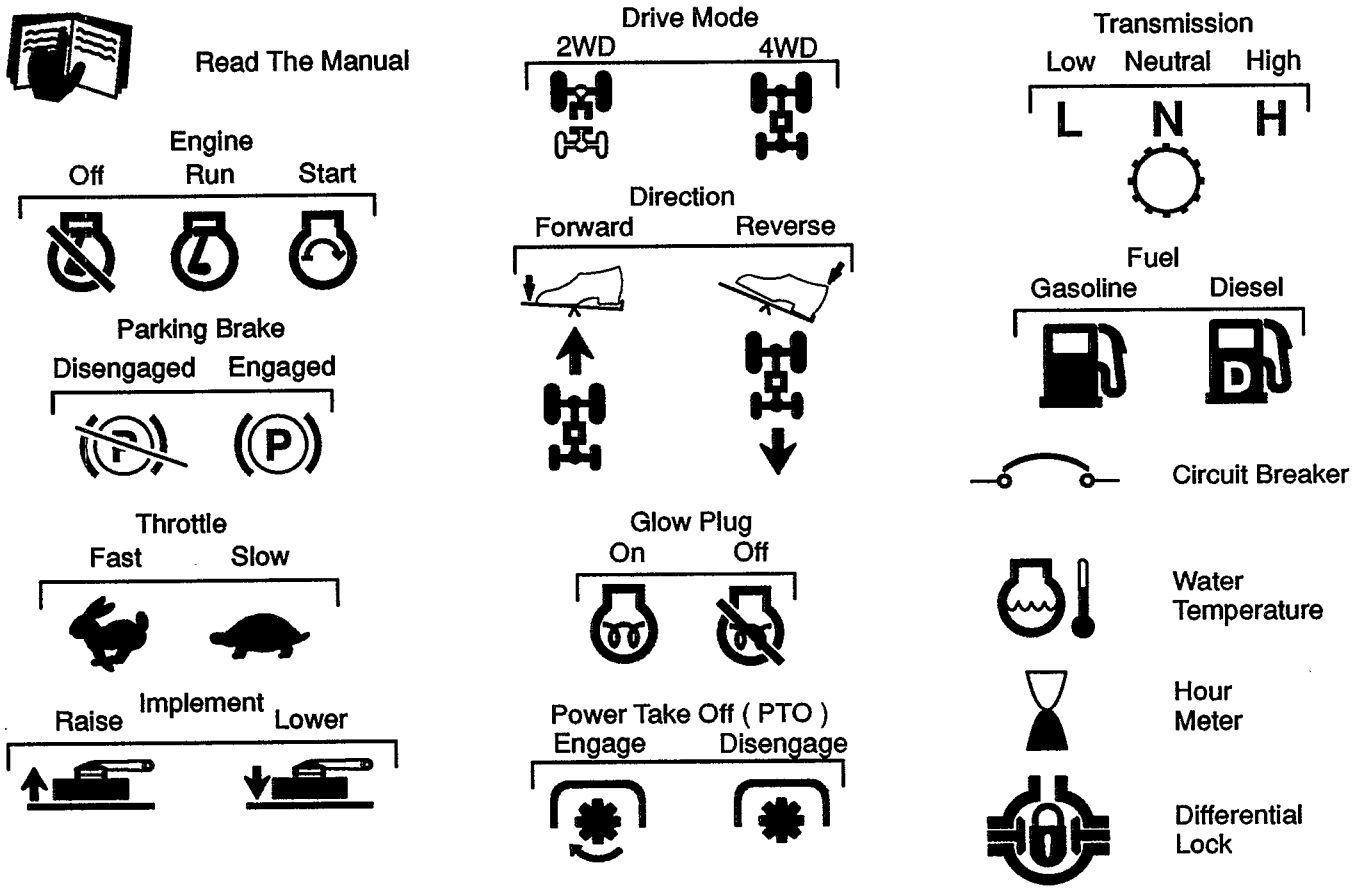
Contact your Jacobsen Distributor for a complete listing of accessories and implements.

Air Gun	JAC5098
2 Post ROPS and Canopy with Belt	66141
4 Post ROPS and Canopy with Belt	66091
60" Flail Mower	66144
60" Mulcherizer Mower	66161
60" Side Discharge Mower	66122
60" Rear Discharge Mower	66124
72" Side Discharge Mower	66126
72" Rear Discharge Mower	66120
72" Wide Mouth Mulcher Kit	66157
72" Mulcherizer Mower	66162
Arm Rest (For 66155)	66156
Cloth Cab, Wipers and Fan	66092
Cruise Control Kit	66145
Deluxe Suspension Seat	66155
Paint (Orange, 12 oz., spray)	554598
Quick Disconnec Kits	
Full Kit	66142
Half Kit	66143
Right Hand Turn Assist	66103
Vertical Blade Kit (60" Flail)	66106

1.7 SERVICE SUPPORT LITERATURE

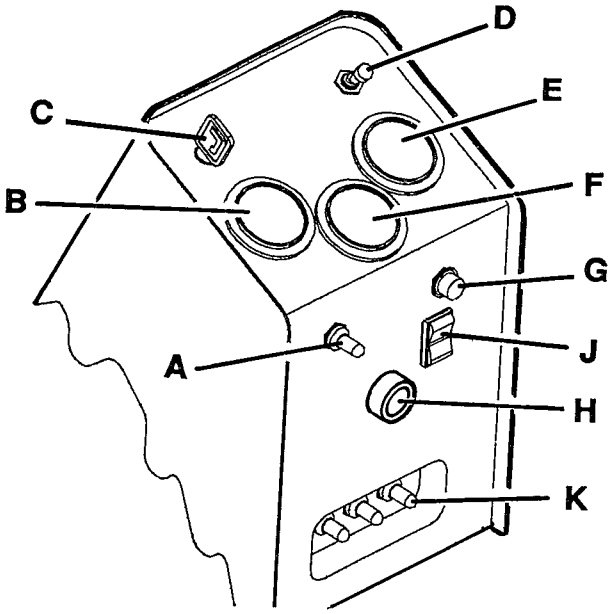
Operator's Manual (English)
Operator's Manual (Spanish)
Operator's Manual (French)
Replacement Parts Catalog
Engine Parts Catalog (Diesel)
Engine Service Manual
Tractor Service Manual
Operator Training Video

2.0 ICONS



CAUTION: Do not attempt to drive the tractor unless you have read the Operator's Manual and know how to operate all controls correctly. Learn the location and purpose of all the controls and gauges before you operate this tractor.

Figure 2A



2.1 INSTRUMENT PANEL

A. **Glow Plug Switch:** Used to energize the glow plugs. (Section 3.3)

B. **Voltmeter:** Indicates battery condition and charge level.

C. **Ignition Switch:** Refer to Section 3.3 for complete starting instructions. *Always remove the ignition key when the tractor is not in use.*

D. **Power-Take-Off Switch:** Used to operate implements. The PTO switch must be disengaged to start the engine.

DANGER

To prevent serious bodily injury, make certain the implement is lowered to the ground before engaging the PTO switch. Always disengage the PTO switch when the implement is not being used.

E. Diesel Temperature Gauge: Indicates engine coolant temperatures. Normal operating temperature should be between 180° and 205° F (82° and 90° C).

F. Hourmeter: Indicates engine operating hours. Can be used to track maintenance intervals or the time required to perform tasks. The meter operates only when the ignition is "ON".

G. Engine Oil Pressure Light: Will light if engine oil pressure drops below a safe level. Stop engine immediately and correct the problem before resuming operation.

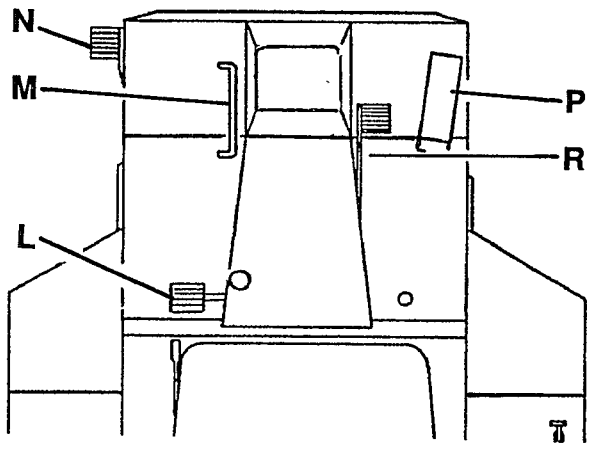
H. Horn: Sounds if engine temperature reaches an excessive level. Stop and determine cause.

J. 4-WD Switch (4-WD Models): Used to select 2-WD or 4-WD (Section 3.4).

K. Circuit Breaker:

1. The reset button extends outwards for visible indication when an overload occurs and the breaker opens.
2. To reset the breaker, depress the cap.

Figure 2B



2.2 PEDALS

L. Differential Lock Pedal (4-WD Models): Used to improve traction.

Note: When the differential lock is applied steering control will be affected. Do not apply when wheels are spinning.

M. Lift Pedal: Used to lift and lower the implements used with the tractor. The engine must be running to lift the implement but will lower the implement with engine off. Depress front extension of pedal to lower the implement or rear extension of pedal to lift.

Depress pedal until cylinder is fully retracted to allow the implement to "float" properly.

N. Traction Assist Pedal: Is designed to aid in trimming and hill climbing (Section 3.7-4).

To turn left in a tight area, reduce forward speed, then depress the traction assist pedal while turning left.

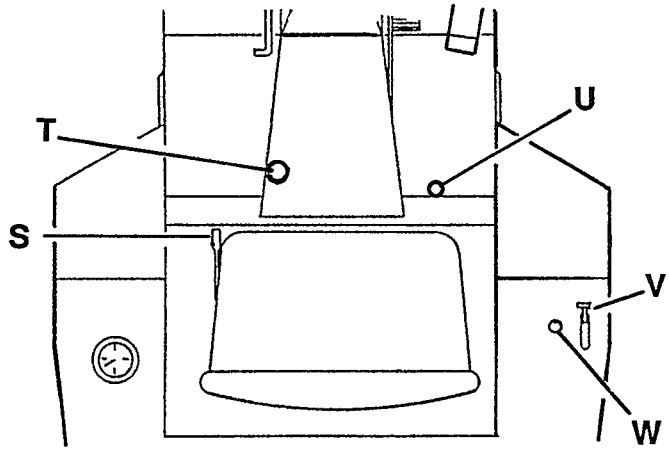
⚠ WARNING

To prevent serious injuries or property damage, do not attempt to stop the machine with the traction assist pedal and never use traction assist at high speeds.

P. Traction Pedal: Used to control the speed and direction of the tractor. The pedal will return to neutral when released.

R. Parking Brake Pedal: Used in conjunction with parking brake lock (2.3-U). Parking brake must be engaged to start engine.

Figure 2C



2.3 LEVERS

S. Seat Position Lever

T. Transmission Shift Lever: Three positions: high range, low range and neutral. The lever must be in "neutral" to start the engine.

U. Parking Brake Lock: First, fully depress brake pedal (R), pull the parking brake lock upwards and release brake pedal. To disengage, depress brake pedal and push parking brake lock down.

V. Throttle Lever: Regulates engine speed. Push lever forward to increase or pull lever backwards to decrease engine speed.

W. Choke

3.0 DAILY INSPECTION

CAUTION: The daily inspection should be performed only when the engine is off and all fluids are cold. Lower implements to the ground, engage parking brake, stop the engine and remove ignition key.

1. Perform a visual inspection of the entire unit, look for signs of wear, loose hardware, missing or damaged components. Check for fuel or oil leaks.
2. Check the fuel supply, radiator coolant level, crankcase oil and hydraulic oil. All fluids must be at the full level mark.
3. Make sure the implement is properly assembled to tractor and is properly adjusted.
4. Make sure the machine is lubricated and the tires are properly inflated.
5. Test the operator back-up system.

3.1 OPERATOR BACKUP SYSTEM

1. The operator backup system prevents the engine from starting unless the parking brake is engaged, the PTO is disengaged, and the transmission is in neutral. The system also stops the engine if the operator leaves the seat with the PTO engaged, the transmission in gear or the parking brake disengaged.

WARNING

Never operate equipment with the operator back-up system disconnected or malfunctioning. Do not disconnect or bypass any switch.

2. Perform each of the following tests to insure the operator back-up system functions properly. Stop the test and have the system inspected and repaired if:
   - the engine **does not** start in test 1, or;
   - the engine **does** start during tests 2, 3 or 4;
   - the engine **continues** to run during tests 5, 6 or 7.
3. Refer to the chart for each test and follow the check (✔) marks across the chart.

   Test 1: Represents normal starting procedure. The operator is seated, parking brake is engaged, the transmission is in neutral and the PTO is disengaged.

   Test 2: The engine must not start if the PTO is engaged.

   Test 3: The engine must not start if the parking brake is disengaged.

   Test 4: The engine must not start if the transmission is not in "neutral".

   Test 5: Start the engine, engage PTO then lift your weight off the seat.★

   Test 6: Start the engine, disengage parking brake, lift your weight off the seat.★

   Test 7: Start the engine, shift transmission to "low" (be sure parking brake is engaged) lift your weight off the seat.★

Chart - Operator Back-up Test

Test	Operator Seated		Parking Brake		Trans. in Neutral		PTO Switch		Engine Operates	
	Yes	No	On	Off	Yes	No	On	Off	Yes	No
1	✔		✔		✔			✔	✔	
2	✔		✔		✔		✔			✔
3	✔			✔	✔			✔		✔
4	✔		✔			✔		✔		✔
5	✔	★	✔		✔		✔		★	✔
6	✔	★		✔	✔			✔	★	✔
7	✔	★	✔			✔		✔	★	✔

★ - Lift your weight off seat, the cutting units must stop rotating within seven (7) seconds.

3.2 OPERATING PROCEDURES

CAUTION: To help prevent injury, always wear safety glasses, leather work shoes or boots, a hard hat, and ear protection.

1. Under no circumstances should the engine be started with operator standing next to the tractor.
2. Do not operate tractor or implements with loose, damaged, or missing components. Whenever possible mow when the grass is dry.
3. First mow in a test area to become thoroughly familiar with the operation of the tractor and control levers.

WARNING

Seat belts must be worn whenever a ROPS is installed on the tractor. Do not use seat belts on a tractor without a ROPS.

Always keep seat belt snugly adjusted.

If a ROPS is installed and the tractor is overturning, hold onto the steering wheel. Do not attempt to jump out or leave the seat.

4. Study the area to determine the best and safest operating procedure. Consider the height of the grass, type of terrain and condition of the surface. Each condition will require certain adjustments or precautions.
5. Never direct discharge of material toward bystanders, nor allow anyone near the machine while in operation.

CAUTION: Pick up all the debris you can find before mowing. Enter a new area cautiously. Always operate at speeds that allow you to have complete control of the tractor.

6. Use discretion when mowing near gravel areas (roadway, parking areas, cart paths, etc). Stones may be discharged and cause serious injuries to bystanders and/or property damage.
7. Stop the machine immediately after striking an obstruction or if the machine begins to vibrate abnormally. Have the machine inspected and repaired before resuming operation.
8. Disengage PTO and raise the implement when crossing paths or roadways. Look out for traffic.

WARNING

Before you adjust, clean or repair this equipment, disengage all drives, lower implements to the ground, engage parking brake, stop engine, and remove key from ignition switch to prevent injuries.

3.3 TO START ENGINE

IMPORTANT: ***Do not use starting assist fluids.*** Use of such fluids in the air intake system may be potentially explosive or cause a "Runaway" engine condition and could result in serious engine damage.

1. Sit in operator's seat, make sure PTO is disengaged, parking brake is locked and transmission lever is in "neutral" position.

   Fasten seat belt when operating tractors equipped with a ROPS.
2. Move throttle lever to 1/3 throttle and turn ignition switch to "ON" position.
3. *(Diesel Engine Only)* Depress glow plug switch for about five (5) seconds then release the switch. The colder the temperature, the longer it will take to energize the plugs. This step is not necessary when starting a warm engine.
4. *(Gasoline Engine Only)* Pull choke knob upwards to close the choke plate. Refer to the engine manual for additional starting instructions.
5. Turn ignition key to "Start" position and release as soon as engine starts. Do not hold key in "Start" position for more than 10 seconds at a time.
6. Allow the engine to become warm and properly lubricated before operating at high R.P.M.

3.4 TO DRIVE / TRANSPORT

If the tractor is driven on public roads, it must comply with state and local ordinances. Contact local authorities for regulations and equipment requirements.

CAUTION: When operating tractor without implements travel at reduced speeds when making turns to prevent tipping or loss of control.

1. Disengage PTO and raise implement to the transport position.
2. Disengage parking brake, place transmission lever in "high" or "low" range. (Select 2 or 4 wheel drive on 4-WD models).

   Once the 4-WD switch is activated, the Turfcat will shift from 4-WD to 2-WD when the traction pedal is released. The system will then return to 4-WD when traction pedal is depressed.

   When changing from 4-WD to 2-WD, decelerate to approximately 5 MPH (8 kph) before activating the 2-WD/4-WD switch.
3. Move throttle to "fast" position and slowly depress top of traction pedal to move forward or bottom of traction pedal to move in reverse.

   Always come to a complete stop before shifting from forward to reverse or when applying the differential lock.

3.5 TO PARK / STOP

1. If any emergency arises and the tractor must be parked on the area of operation, follow the guidelines outlined by the grounds superintendent.

   If the tractor is parked on an incline, chock or block the wheels.
2. To park the tractor under normal conditions, disengage PTO then raise and lock the implements in the transport position and move away from the area of operation.
3. Select a flat and level area to park.
   a. Release traction pedal and bring the tractor to a complete stop. Engage parking brake and lock.
   b. Disengage all drives, lower implements to the ground, reduce throttle to 1/4 or 1/3 and allow engine to operate at no load for 2 to 3 minutes.
   c. Engage parking brake, stop the engine and always remove ignition key.

3.6 TO MOW

1. Mow with the uncut grass to the left of the mower (side discharge mowers only) so that grass clippings will be discharged evenly.
   a. Discharging clippings over uncut grass creates a buildup of grass clippings that may prevent uniform cutting and impose an unnecessary load on the tractor and mower.
   b. Plan the mowing pattern so you can mow straight forward as much as possible.
2. Reversing and changing mowing direction each time you mow will help to eliminate matting, graining, and corrugation, thereby enhancing the appearance of the grass.

⚠ DANGER

Operating the mower with damaged or missing components or without the discharge deflector, greatly increases the risk of serious bodily injury from objects being discharged and striking bystanders and/or the operator.

Always keep discharge chute aimed downhill when mowing on a slope. Keep the discharge deflector securely fastened.

3. The correct operating speed will depend on the height, density and type of grass to be cut as well as the type of terrain.
   a. For extremely tall grass, first cut at a higher setting and then at the desired height.
   b. Always mow with the throttle lever in "fast" position.
   c. Vary ground speed with the traction pedal.
   d. Slow down when turning, operating in tight areas, mowing on hillsides or over rough terrain and when trimming with left side of mower.
4. Lower implement to the ground. Make sure lifting cylinder is fully retracted.

⚠ DANGER

To prevent serious injury, make certain the implement is fully lowered before engaging the PTO. Always disengage the PTO when the implement is not being used or when removing obstructions from the implement.

5. Shift transmission lever to low range and select 2-WD or 4-WD.
6. Engage PTO and slowly depress traction pedal.

   IMPORTANT: Never use the PTO to dislodge material from the implement. Engaging the PTO with a plugged implement could cause permanent damage to the implement and tractor.

3.7 HILLSIDE OPERATION

⚠ WARNING

To minimize the possibility of overturning, the safest method of operating on hills and terraces is to travel up and down the face of the slope (vertically) not across the face (horizontally). Avoid unnecessary turns, travel at reduced speeds, and stay alert for hidden hazards.

⚠ **CAUTION:** Do not operate this tractor on slopes greater than 12.5 degrees without first installing a R.O.P.S. Never use this tractor on slopes greater than 18.8 degrees.

1. The tractor has been designed for good traction and stability under normal mowing conditions; however, use caution when operating on slopes, especially when the grass is wet. Wet grass limits traction and steering control.
2. Always mow with engine at full throttle. Use the traction pedal to reduce forward speed to maintain the proper cutting frequency.
3. To prevent tipping or the loss of control do not start or stop suddenly or make sharp turns. Lower implement to the ground when descending slopes.
4. Climb at an angle to the hill with the left wheel higher than the right wheel. If the left wheel begins to spin, apply traction assist (Section 2.2-N) to regain traction.
5. If the tractor tends to slide or the tires begin to "mark" the turf, angle tractor into a less steep grade until traction is regained or tire marking stops.
6. If tractor continues to slide or mark the turf, the grade is too steep for safe operation. Do not make another attempt to climb. Disengage PTO and back down slowly.

3.8 WHEEL WEIGHTS

1. To improve traction and steering control, wheel weights can be added to the wheels.
   a. The extra weight should only be added after careful consideration of the mowing conditions.
   b. Extra weight may limit the tractor's ability to climb slopes.
   c. Wheel weights should be used in pairs. Operation with weight on one side only will cause uneven tire wear and will cant or tip the tractor.
2. Liquid fill can also be used in the rear tire as an alternate or in addition to the weight.
   a. If the anticipated temperatures are below freezing, use a calcium chloride solution.

b. Fill 3/4 of the tire with liquid then use compressed air to inflate to the recommended pressures. (Section 5.17)
c. Turn the wheel so that valve stem is at the top before checking inflation pressure of liquid filled tires.

IMPORTANT: If calcium chloride is used for an extended period of time, use inner tubes and change the valve stem to type TR 4166.

3.9 AFTER OPERATION

1. Park the tractor on a flat and level surface, fully lower the implements to the ground, engage parking brake, stop the engine and remove key from ignition switch.
2. Lubricate then wash the equipment after each use. (Section 5.5).

CAUTION: Do not wash a hot or running engine. Use compressed air to clean the engine and radiator.

3. Fill the fuel tank with fresh fuel at the end of every operating day (Section 5.8). Be sure to reinstall and tighten fuel cap.
4. Check the air filter service indicator.

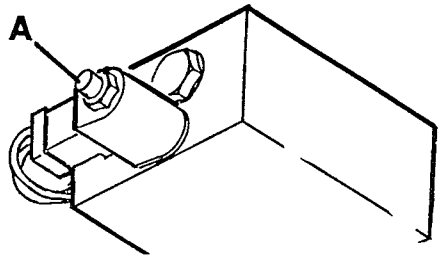
3.10 TO TOW (4-WD Models)

1. The valve block is located under the tractor and the override button is accessible from the rear of the tractor.
2. Before towing the tractor, push button (A) in and twist counterclockwise 180° from its normal operating position.

CAUTION: With the override button in this position the valve may be only partially shifted. Do not exceed 2 mph (3.2 kph) when towing.

3. Disengage parking brake and shift transmission to neutral.
4. After towing, push button in, twist clockwise and release.

Figure 3A



3.11 TROUBLESHOOTING

Before making any adjustments or performing maintenance, read the entire adjustment or maintenance section for proper procedures and warnings.

Symptoms	Probable Causes	Solution
Engine does not start.	Empty fuel tank or dirty fuel.	Add or drain and refill with fresh fuel Section 5.7
	Battery, Fuses.	Operator controls not set properly
	Operator Back-up system.	Section 3.1
	Electrical system.	Section 5.2, 5.5
	Engine - Glow plugs.	Test, Replace glow plugs
Engine hard to start or runs erratically, stalls, looses power or stops	Fuel leaks, dirty fuel, incorrect fuel	Refill with proper grade, clean fuel Check fuel filter, tighten hose clamps
	Loose wiring	Section 5.5
	Air intake, air filter plugged	Check indicator
	Engine overload	Reduce forward speed
Engine overheating	Low coolant	Check radiator, Section 5.15
	Loose water pump belt	Tighten belt, Section 4.2
	Engine overload	Reduce forward speed
Battery does not hold charge	Loose, corroded battery terminals	Section 5.2
	Low electrolyte	Section 5.2
	Alternator not charging	Loose fan belt, Section 4.2
Gauges/Indicator not operating	Fuses and bulbs	Replace fuses, check bulb
	Loose wiring	Section 5.5
Tractor does not react to traction pedal	Parking brake	Disengage brake
	Low oil	Check oil level

ADJUSTMENTS

4.0 PROCEDURE

⚠ WARNING

Before you adjust, clean or repair this equipment, always disengage all drives, lower implements to the ground, engage parking brake, stop engine and remove the ignition key to prevent serious injury.

Any adjustments or repairs performed while the engine is running must be made with ample ventilation. Carbon monoxide in the exhaust fumes can be fatal when inhaled.

Never work on a vehicle that is supported only by the jack. Always use jack stands and make sure the tractor is on solid and level ground.

If only one end of the tractor is raised, place chocks in front of and behind the wheels that are not raised.

1. Adjustments and maintenance should always be performed by a qualified technician. If proper adjustment cannot be made, contact an Authorized Jacobsen Distributor.
2. Replace, do not adjust, worn or damaged components.

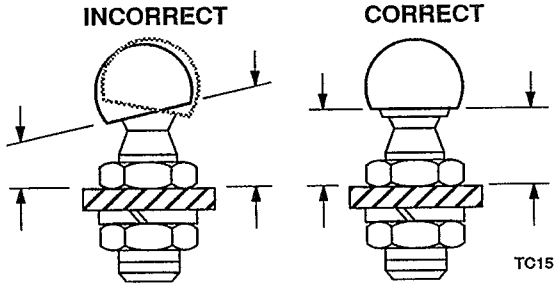
⚠ **CAUTION:** Be careful to prevent entrapment of the hands and fingers between moving and fixed components of the machine. Do not wear jewelry or loose fitting clothing when adjusting or repairing any equipment.

3. Do not change governor setting or overspeed the engine.
4. To gain access to battery and hydraulic lines, tilt the seat forward and insert seat stop. To gain access to the transaxle and brake, remove the floorboard.

4.1 BALL JOINTS

Whenever adjusting ball joints, the cut-out in the ball joint must be parallel to the mounting bracket (within 1/4 in., (6 mm) per foot), then secure in place.

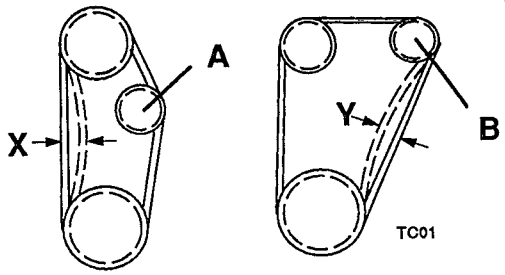
Figure 4A



4.2 BELT

1. Replace worn or frayed belts immediately.
2. Adjust idler pulley (A) so fan belt deflects 3/16 in., (5 mm) with 1.2 to 1.5 lb., (.54 to .68 Kg) force at point (X).

Figure 4B



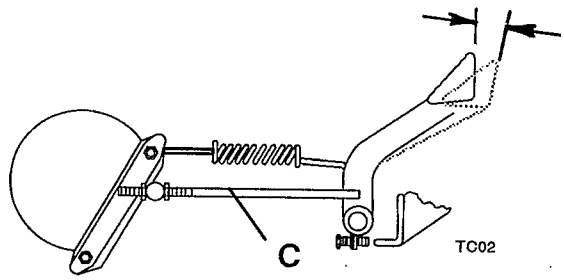
3. Adjust alternator pulley (B) so water pump belt deflects 1/4 to 3/8 in., (6 to 9 mm) with 20 lb., force at point (Y).

4.3 BRAKE PEDAL

As the brake lining wears adjust rod (C) to allow 3/4 to 1.00 in., (19-25 mm) free travel in brake pedal.

As a final check, stop the tractor on a hill and apply the parking brake - lock. If the tractor rolls, readjust rod (C).

Figure 4C



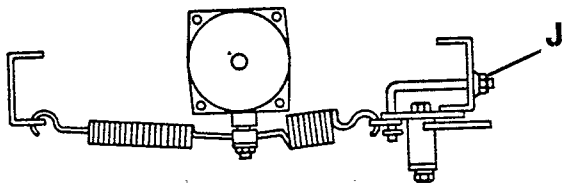
4.4 HYDRO NEUTRAL

1. If the tractor "creeps" in either direction when the engine is running but the traction pedal is not depressed, adjust spring tension so that the pedal always returns to "neutral" when released.

   IMPORTANT: The tractor may "creep" when the transmission oil is cold. Operate the tractor for 15 minutes before determining if adjustment is required.

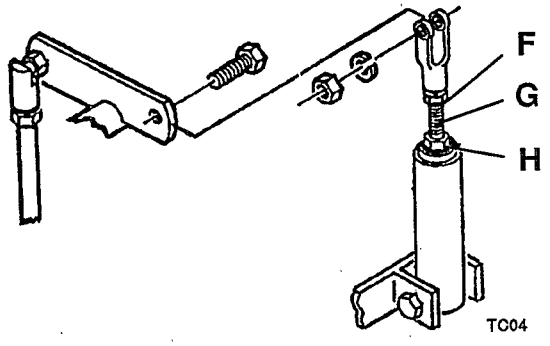
2. Use extreme caution when making this adjustment as the wheels will be off the ground and the engine will be running.
3. Tilt the seat forward and place a small amount of lubricating oil on all the pedal linkage pivot points.

4. Hoist the tractor so all four tires are off the ground. Place blocks under the frame to prevent accidental lowering of the tractor during adjustments.
   a. Disengage parking brake and place the 4-WD/2-WD switch in 2-WD position (4-WD Tractors only).
   b. Start engine and move throttle lever to full speed.
   c. Check rotation of drive tires and then make the adjustment with the engine running.
5. (2-WD Tractors) Adjust nut (J) 1/2 turn counterclockwise for forward creep or 1/2 turn clockwise for backward creep.



6. (4-WD Tractors)
   a. To find the neutral point of the hydro, loosen nut (F) and adjust rod (G) by turning nut (H) inwards to adjust for forward creep or outwards to adjust for backward creep.
   b. When the drive tires stop turning, the hydro is in neutral. Hold nut (H) in place and tighten nut (F) against the yoke. Stop the engine.

Figure 4E

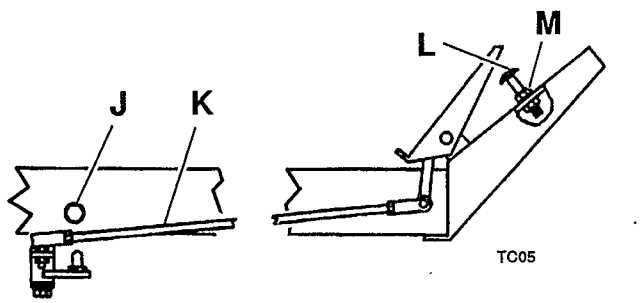


4.5 TRACTION PEDAL STOP

1. **Forward:** Move the pedal to its maximum forward position. Adjust stop bolt (L) until the bolt head touches the pedal. Then turn the bolt one revolution counterclockwise (out against pedal) and tighten nut (M).
2. **Reverse:** Pedal travel can be adjusted with rod (K). After adjusting the rod, stop bolt (L) must be readjusted.

   IMPORTANT: Excessive travel speed in reverse may cause steering tires to "lock".

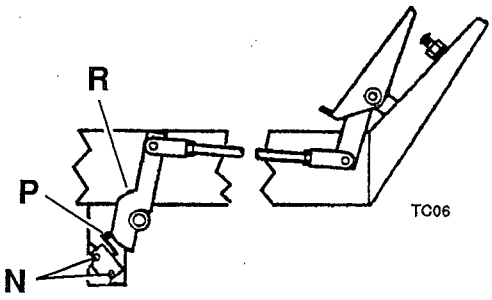
Figure 4F



4.6 REVERSE SENSING SWITCH

1. If the switch is not properly adjusted, the 4-WD function may be delayed or prematurely engaged.
2. Loosen screws (N) and adjust switch, so that wiper (P) is activated by arm (R) as soon as pedal is depressed in the forward direction.
3. Tighten hardware (N).

Figure 4G

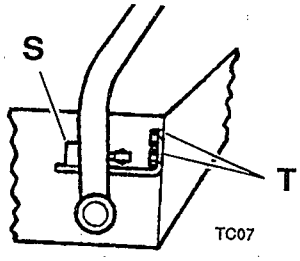


4.7 INTERLOCK SWITCH - BRAKE

The switch insures the engine will start only if the brake is applied and also inhibits reverse movement in rear wheels (4-WD only).

1. Loosen screws (T) and adjust switch (S) so that switch opens as soon as brake pedal is depressed.
2. Tighten hardware.

Figure 4H



4.8 INTERLOCK SWITCHES (4-WD Models)

Switch (X) is to insure braking on the rear axle when shifting through neutral on an uphill grade.

1. Position shift lever in neutral.
2. Loosen screws (Y) and adjust switch (X) so that actuating arm of shift lever opens the contacts of switch (X).
3. Tighten hardware.

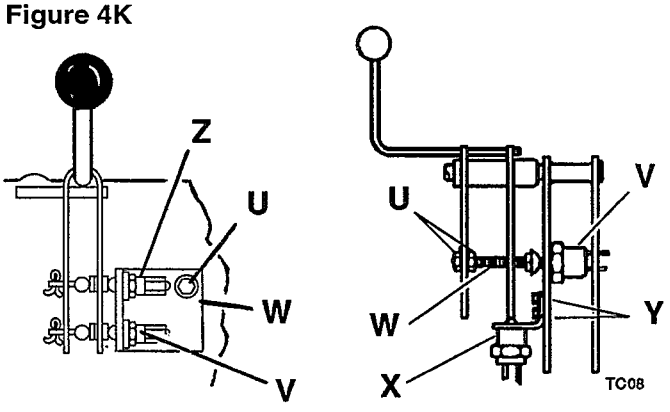
4.9 INTERLOCK SWITCH - NEUTRAL

Switch (V) is to insure the tractor will start only if the transmission in neutral (all models).

Switch (Z) must be adjusted so the PTO will not work when the shift lever is in high range.

1. Position shift lever in neutral.
2. (4-WD tractors) Loosen nuts (U) and adjust bolt (W) so that the head of the bolt closes the contacts of switch (V).
3. (2-WD tractors) Loosen nut (U) and adjust bracket (W) so that pivot rod engages ball on switch (V) when lever is in neutral, and switch (Z) when lever is in high range.
4. Tighten all hardware.

Figure 4K

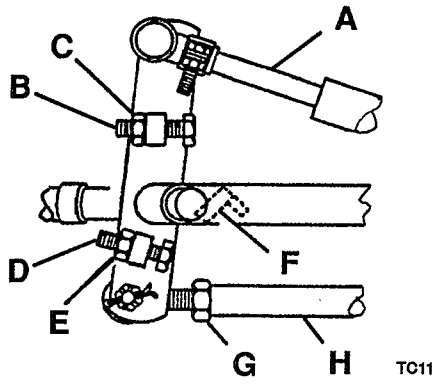


4.10 STEERING STOP BOLTS

The bolts are adjusted to prevent the steering cylinder rod from becoming completely extended or retracted during normal operation.

1. Loosen nut (C) and turn bolts (B) completely in against mounting block.
2. Turn steering wheel to **left** so steering cylinder rod (A) is completely retracted then turn the steering wheel to the right to extend the rod 1/16 to 1/8 in., (2 to 3 mm).
3. Adjust bolt (B) until it touches steering stop block (F). Tighten nut (C) against mounting block to lock the bolt in place.
4. Turn steering wheel to **right** so steering cylinder rod (A) completely extended then turn the steering wheel to the left to retract the cylinder 1/16 to 1/8 in., (2 to 3 mm).
5. Adjust bolt (D) until it touches steering stop block (F). Tighten nut (E) against mounting block to lock the bolt in place.

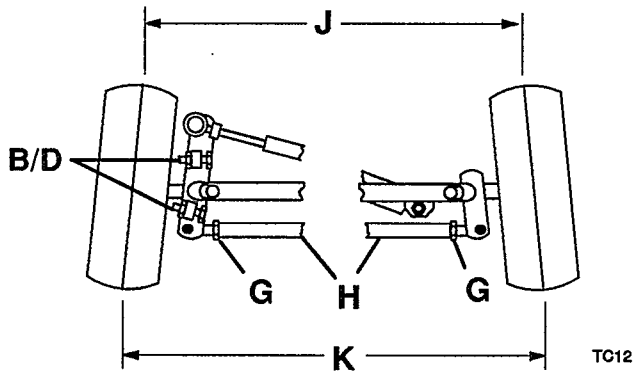
Figure 4M



4.11 "TOE IN"

1. Turn wheels to straight ahead position and loosen nuts (G).
2. Adjust tie rod (H) so dimension 'K' is 3/8 in., (9mm) greater than 'J'. Retighten nuts (G).
3. After adjusting "Toe in" it may be necessary to readjust steering stop bolts (B and D).

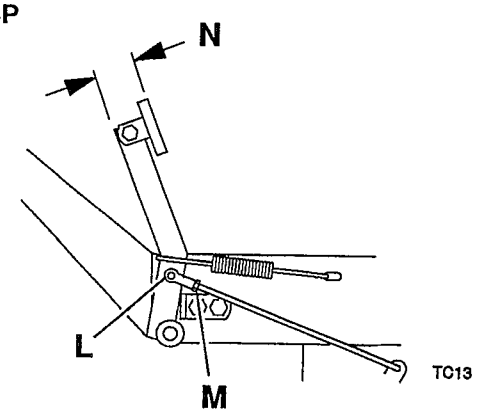
Figure 4N



4.12 TRACTION ASSIST PEDAL

1. Remove yoke (L) from pedal and loosen nut (M).
2. Adjust yoke (L) to obtain 3/4 to 1 in., (19 - 24 mm) free travel. (N)
3. Tighten nut against the yoke and reassemble yoke to pedal.

Figure 4P



4.13 TORQUE REQUIREMENTS

1. Tie rod ball joints (2): 20 ft lb., (27 Nm). Continue to tighten until the next slot lines up with the cotter pin hole.
2. Steering cylinder ball joints (2): 45 ft lb., (61 Nm). Continue to tighten until the next slot lines up with the pin hole.
3. Check and retorque wheel mounting hardware daily until torque is maintained.

   Front wheel: 40-50 ft lb., (54-68 N-m).

   Rear wheel: 85-90 ft lb., (115-122 N-m).
4. Standard Jacobsen torque specifications for Grade 5 coarse hardware.

Size	Torque (Ft/Lbs)	Torque (N.m)
1/4"	9.5 to 10.8	12.9 - 14.7
5/16"	19.5 to 21.7	26.5 - 29.4
3/8"	35 to 40	47.2 - 54
1/2"	80 to 95	108 - 128
5/8"	160 to 185	216 - 249

5.0 PROCEDURE

⚠ WARNING

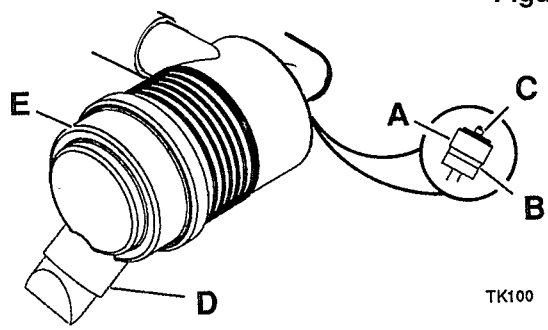
Before you adjust, clean or repair this equipment, disengage all drives, lower implement to the ground, engage parking brake, stop engine and remove key from ignition switch to prevent injuries.

1. Adjustment and maintenance should always be performed by a qualified technician.
2. Inspect the equipment on a regular basis, establish a maintenance schedule and keep detailed records.
   a. Keep all equipment clean.
   b. Keep all moving parts properly adjusted and lubricated.
   c. Replace worn or damaged parts before operating the machine.
   d. Keep all fluids at their proper levels.
   e. Keep shields in place and all hardware securely fastened.
   f. Keep tires properly inflated.
3. Do not wear jewelry or loose fitting clothing when making adjustment or repairs.
4. Use the illustrations in the Parts Catalog as reference for the disassembly and reassembly of components.
5. Recycle or dispose of all hazardous materials (batteries, fuel, lubricants, anti-freeze, etc.) according to local, state or federal regulations.

5.1A AIR FILTER (Diesel Engine)

1. Check the service indicator (A) daily. If a red band appears in the window (B) replace the element.
2. **Do not remove the element for inspection or cleaning.** Unnecessary removal of the filter increases the risk of injecting dust and other impurities into the engine.
3. When service is required, first clean the outside of the filter housing; then remove the old element as gently as possible and discard.
   a. Carefully clean the inside of the filter housing without allowing dust to fall into the intake.
   b. Inspect the new element. Do not use a damaged element and never use an incorrect element.
   c. Assemble the new element and make sure it seats properly. Reset the indicator by depressing button (C).
   d. Reassemble cap (E) making sure it seals completely around the filter housing. Dust evacuator (D) must be facing down.
   e. Check all hoses and air ducts. Tighten hose clamps.

Figure 5A



5.2 BATTERY

1. Make absolutely certain the ignition switch is "Off" and the key has been removed before servicing the battery.

⚠ **CAUTION:** Always use insulated tools, wear protective glasses or goggles and protective clothing when working with batteries. You must read and obey all the battery manufacturer's instructions.

2. Verify battery polarity before connecting or disconnecting the battery cables.
   a. When installing the battery, always assemble the red, positive (+), battery cable first and the black ground, negative (-), cable last.
   b. When removing the battery, always remove the ground, negative (-), cable first, and the red, positive (+), cable last.
3. Check the electrolyte level.
4. Clean the cable ends and battery posts with steel wool. Use a solution of baking soda and water to clean the battery. Do not allow the solution to enter into the battery cells.
5. Tighten cables securely to battery terminals and apply a light coat of silicone dielectric grease to terminals and cable ends to prevent corrosion. Keep terminal covers in place.
6. Make certain the battery is securely fastened to battery tray.

5.3 BATTERY – CHARGING

1. Refer to Section 5.2. Read the Battery and Charger's manual for specific instructions.

⚠ DANGER

Charge battery in a well ventilated area. Batteries generate explosive gases. To prevent an explosion, keep any device that may create sparks or flames away from the battery.

To prevent injury, stand away from battery when the charger is turned on. A damaged battery could explode.

2. Whenever possible, remove the battery from the tractor before charging and make sure the electrolyte covers the plates in all the cells.
3. Make sure the charger is "Off", then connect the charger to the battery terminals as specified in the Charger's Manual.
4. Always turn the charger "Off" before removing a charger lead from the battery.

5.4 CARE AND CLEANING

1. Wash the tractor and implements after each use. Keep the equipment clean.

⚠ **CAUTION:** Do not wash any portion of the equipment while it is hot. Do not use high pressure spray or steam. Use cold water and automotive cleaners.

2. Use compressed air to clean the engine and radiator fins. A special Blow Gun is available from your Jacobsen Distributor.
3. Do not spray water directly at the instrument panel, electrical components or at bearing housings and seals.
4. Clean all plastic or rubber trim with a mild soap solution or use commercially available vinyl/rubber cleaners.
5. Repair damaged metal surfaces and use Jacobsen "Orange" touch-up paint (Section 1.6). Wax the tractor for maximum paint protection.

5.5 ELECTRICAL SYSTEM

Always turn the ignition switch off and remove the negative battery cable before checking connections or wires.

1. Make certain all terminals and connections are kept clean and properly secured.
2. Check the operator backup system, fuses and circuit breakers regularly.

⚠ WARNING

Never operate tractor with the operator backup system disconnected or malfunctioning.

3. If the operator back-up system does not function properly, or the problem cannot be corrected, contact an Authorized Jacobsen Distributor.
4. Keep the wire harness and all individual wires away from moving parts to prevent any type of damage. Make sure the seat switch harness is connected to the main wire harness.

5.6A ENGINE (Diesel)

1. During the first 50 hours of operation, a new engine should be operated at full load. The engine *must be allowed to reach an operating temperature of at least 140°F (60°C) prior to operation at full load.*
2. Check the engine oil level *twice* daily during the first 50 hours of operation. *Higher than normal oil consumption is not uncommon during the initial break-in period.*
3. Refer to Section 7.1 for specific maintenance intervals.
4. Do not change the engine governor settings or overspeed the engine.
5. If the injection pump, injectors or the fuel system require service, contact your Jacobsen Distributor.

5.6B ENGINE (Gasoline)

Refer to your Ford Engine Manual for break-in procedures and maintenance intervals.

5.7 FUEL SYSTEM

1. Fill tractor's fuel tank at the end of each operating day to within 1 in., (25 mm) below filler neck.
   a. Diesel: Use clean, fresh, #2 Diesel fuel. Minimum Cetane Rating 45.
   b. Gasoline: Use clean, fresh unleaded gasoline, 87 octane minimum.
   c. Be sure to reinstall and tighten fuel caps securely.
2. Handle fuel with care - it is highly flammable. Use an approved container, the spout must fit inside the fuel filler neck. Avoid using cans and funnels to transfer fuel.
   a. Never remove the fuel cap from the fuel tank, or add fuel, when the engine is running or while the engine is hot.

5.7 Continued

b. Do not smoke when handling fuel. Never fill or drain the fuel tank indoors.
c. Never overfill or allow the tank to become empty. Do not spill fuel and clean spilled fuel immediately.
d. Never handle or store fuel containers near an open flame or any device that may create sparks and ignite the fuel or fuel vapors.

3. Replace fuel filters as specified in Section 7.1.
4. Store fuel according to local, state or federal ordinances and recommendations from your fuel supplier.

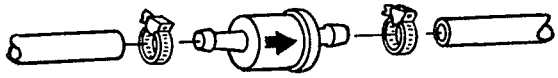
5.8 FUEL FILTERS

Before servicing any filter, thoroughly clean the filter housing and the area around the filter. Dirt must not be allowed to enter into the fuel system.

Refer to Section 7.1 for specific maintenance intervals.

1. Disconnect the hoses from the primary filter. Remove and discard the filter.
2. Assemble new filter with the arrow pointing away from the tank. Tighten hose clamps.

Figure 5B



3. Remove and discard secondary diesel filter (B - Figure 5C).
   a. Apply a light coat of oil to the gasket and hand tighten.
   b. Fill fuel tank and bleed the fuel system.

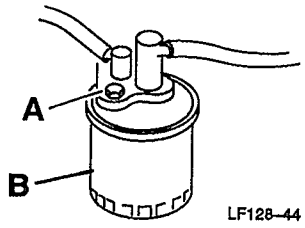
5.9 FUEL SYSTEM – BLEEDING (Diesel)

Bleed the fuel system after the fuel filter and lines have been removed, or after the fuel tank has become empty.

1. Fill the fuel tank to within 1 in., (25 mm) below the filler neck.
2. Open air vent plug (A) on top of the fuel filter then turn the ignition to "On" and allow the fuel pump to fill the filter and purge the air from the system.
3. Close the air vent plug when fuel begins to flow out.

   IMPORTANT: Always keep the air vent plug closed except when air is vented.

Figure 5C



5.10 HYDRAULIC HOSES

1. Always lower implements to the ground, disengage all drives, engage parking brake, stop engine and remove key before inspecting or disconnecting hydraulic lines or hoses.

⚠ WARNING

To prevent serious injury from hot, high pressure oil, never use your hands to check for oil leaks, use paper or cardboard.

Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin. If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

2. Inspect hoses and tubes daily. Look for wet hoses or oil spots and replace worn or damaged hoses and tubes before operating the machine.
3. The replacement tube or hose must be routed in the same path as the existing hose, do not move clamps, brackets and ties to a new location.

   IMPORTANT: The hydraulic system can be permanently damaged if the oil becomes contaminated. Before disconnecting any hydraulic component, clean the area around the fittings and the hose ends to keep impurities out of the system.
   a. Before disconnecting any hydraulic component, tag or mark the location of each hose then clean the area around the fittings.
   b. As you disconnect the component, be prepared to assemble plugs or caps to the hose ends and open ports to keep impurities out of the hydraulic system and also prevent oil spills.
   c. Make sure "O" rings are clean and hose fittings are properly seated before tightening.
   d. Keep the hose from twisting. Twisted hoses can cause couplers to loosen as the hose flexes during operation resulting in oil leaks.
   e. Kinked or twisted hoses can restrict the oil flow causing the system to malfunction and the oil to overheat and also lead to hose failure.

5.11 HYDRAULIC OIL

Refer to Section 7.1 for specific maintenance intervals.

1. Park the tractor on a flat and level surface, fully lower implement to the ground and stop the engine.
2. Thoroughly clean the area around the oil cap to prevent dirt or grass from entering and contaminating the system.
   a. Oil temperature should be at 60°F to 90°F (16°-32°C). Do not check oil level when oil is hot.
   b. Hydraulic oil level should never be below the low level mark or more than 1/4 in., (6 mm) above the full level mark.
   c. Change oil after a major component failure, or if you notice the presence of water, foam, or a rancid odor (indicating excessive heat).
3. Remove drain plug from bottom of tank and remove filler/vent cap.
   a. Check and clean the breather cap.
   b. Replace if necessary.
   c. Drain transaxle on 4-WD tractor.
   d. Reinstall drain plugs and fill hydraulic tank and transaxle (Section 5.19) to full level on dipstick. Use Jacobsen hydraulic oil (Section 7.2-III).
4. Jack up front tires so they spin freely then start engine, place transaxle in neutral. Operate hydraulic system and cycle lift cylinders for a minimum of three minutes. Recheck oil level on dipstick and add oil if necessary.

5.12 HYDRAULIC OIL FILTERS

Refer to Section 7.1 for specific maintenance intervals.

1. Remove old filter(s) and fill new filter with clean oil.
2. Install new filter(s). Hand tighten only.
3. Operate engine at idle speed with hydrostatic pump in neutral for five minutes.
4. Check hydraulic oil level on dipstick and add if necessary.

5.13 JUMPER CABLES

1. First check the condition of the "discharged" battery.
2. Stop engine on vehicle with good battery.
3. Connect RED jumper cable to the positive (+) terminal on the good battery and to the positive (+) terminal on "discharged" battery.
4. Connect BLACK jumper cable from the negative (-) terminal on the good battery to the frame of tractor with discharged battery.
5. First start the engine on vehicle with good battery then start the tractor.

5.14 MUFFLER AND EXHAUST

⚠ WARNING

Exhaust fumes contain carbon monoxide that is toxic and can be fatal when inhaled.

Never operate an engine without proper ventilation.

1. To protect from carbon monoxide poisoning, inspect the complete exhaust system regularly and always replace a defective muffler.
2. Exhaust fumes should be colorless, if you notice a change in the color or sound of the exhaust, stop the engine immediately. Identify the cause and have the problem repaired.
3. Torque all exhaust manifold hardware evenly. Tighten or replace exhaust clamps.

5.15 RADIATOR

⚠ WARNING

To prevent serious burns from hot coolant or steam blow-out, never attempt to remove the radiator cap while the engine is running. Stop engine and wait until it is cool. Even then, use extreme care when removing the cap.

1. Check coolant level daily. Radiator should be full and recovery bottle should be up to the full mark.
2. Drain, flush and refill the cooling system as specified in Section 7.1. Empty and clean the recovery bottle.
3. Mix clean water and ethylene glycol based anti-freeze for your coldest ambient temperature. Read and follow the instructions on the anti-freeze container.
4. Keep hood and radiator air duct screens clean. Use compressed air (30 psi) to clean radiator and oil cooler fins. A special air gun is available through your Jacobsen Distributor (Section 1.6).
5. If you have to add coolant more than once a month, or add more than one quart at a time, have a Jacobsen Turf Equipment Dealer check the cooling system.

⚠ **CAUTION:** Do not pour cold water into a hot engine. Do not operate engine without proper coolant mixture. Install cap and tighten securely.

5.16 ROPS (Roll Over Protection Structure)

1. The seat, the seat belt, mounting hardware and any accessories within the ROPS, should be carefully inspected and all damaged parts replaced immediately.
2. Once the ROPS has been subjected to any form of impact it should be replaced. Use only Jacobsen replacement components as specified in the Parts Catalog.

⚠ **CAUTION:** Do not loosen or remove bolts; do not weld, drill, modify, bend or straighten a damaged structure.

3. Check and retorque all hardware regularly (Section 4.13-4).

5.17 TIRES

1. Keep tires properly inflated to prolong tire life. Pressure should be checked while the tires are cool.
2. Check the pressure and inspect tread wear. Turn the wheel so that valve stem is at the top before checking inflation pressure of liquid filled tires.
3. Use an accurate, low pressure tire gauge.

   Front: 10 psi (70 - 83 kPa)
   Rear: 8 - 10 psi (55 - 70 kPa)

⚠ **CAUTION:** *Unless you have the proper training, tools and experience, DO NOT attempt to mount a tire on a rim. Improper mounting can produce an explosion which may result in serious injury.*

5.18 WHEEL MOUNTING PROCEDURE

⚠ WARNING

Make sure the tractor is parked on a solid and level surface. Never work on a tractor that is supported only by the jack. Always use jack stands.

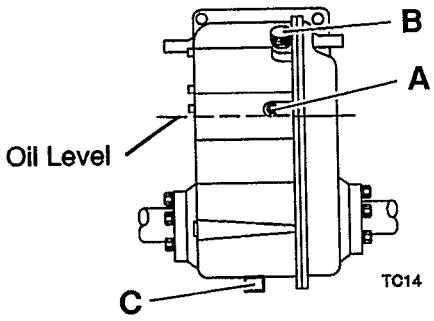
Engage parking brake before lifting the tractor to install wheels.

If only the front or rear of the tractor is raised, place chocks in front of and behind the wheels that are not raised.

1. Remove dirt, grease and oil from stud threads. Do not lubricate threads.
2. Position each wheel on hub and inspect to insure full contact between the mounting surfaces of wheel and hub or brake drum.
3. Finger tighten top nut, then rotate wheel so that the opposite nut is at the top and finger tighten. Finger tighten remaining nuts in (criss-cross) order; always tighten nuts in top position.
4. Check and retorque daily until torque is maintained (Section 4.13-3).

5.19 TRANSAXLE (2WD Models)

Figure 5D



1. To check the oil level:
   a. Park the tractor on a level surface and remove level plug (A).
   b. The lubricant must be maintained just up to the edge of the opening.
   c. Remove vent cap (B). Add oil slowly until the lubricant begins to flow out from port (A).
2. To drain and refill the transaxle:
   a. Lubricant should be drained when it is warm and flows freely.
   b. Remove magnetic drain (C) and plugs (A and B).
   c. Clean and reinstall drain plug (C) then fill slowly through port (B) until oil begins to flow out from port (A). (Section 7.2-VI)

6.0 GENERAL

1. Lubricate all fittings and friction points.
2. Replace the hydraulic oil and oil filters.
3. Wash the tractor thoroughly. Repair and paint damaged or exposed metal.
4. Inspect the tractor, tighten all hardware, replace worn or damaged components.
5. Clean the tires thoroughly and store the tractor so that the load is off the tires. If the tractor is not on jackstands, check the tires at regular intervals and reinflate as necessary.
6. Keep the machine and all its accessories clean, dry and protected from the elements during storage. Refer to the implement's manual for specific storage instructions.
7. Never store equipment with fuel in the tank where fumes may reach an open flame or spark and ignite the fuel or fuel vapors.

6.1 BATTERY

1. Remove, clean and store the battery in upright position, in a cool, dry place.

   Storage above 80°F (26.7°C) greatly increases self-discharge. If wet batteries are discharged, the electrolyte will freeze when stored below 20°F (-7°C).

2. Check and recharge battery every 60 to 90 days while in storage.

6.2A ENGINE (Diesel)

1. While the engine is warm, remove drain plug, drain the oil from the crankcase and change oil filter. Install drain plug and refill with fresh oil (Section 7.2-IV). Torque drain plug to 22 ft. lbs. (30 N-m).
2. Clean exterior of engine. Paint the exposed metal or apply a light coat of rust preventative oil.
3. To prevent the build up of gum residues and varnish films, Jacobsen recommends filling the tank with stabilized fuel. Use an anti-oxidant fuel conditioner, such as STA-BIL®. Read and follow the instructions on the container.

6.2B ENGINE (Gasoline)

Refer to the Ford Engine Manual for recommended storage procedures.

6.3 AFTER STORAGE

1. Check and reinstall the battery (Sections 5.2 and 5.3).
2. Check or service the fuel filters (Section 5.8) and air cleaner (Section 5.1).
3. Check the radiator coolant level (Section 5.15).
4. Check oil level in the engine crankcase and hydraulic system (Section 5.11).
5. Fill the fuel tank with fresh fuel. Bleed the fuel system (Section 5.9)
6. Make certain that the tires are properly inflated (Section 5.17).
7. Refer to the implement's manual for specific instructions.
8. Start the engine and operate at 1/2 throttle. Allow enough time for the engine to become properly warmed and lubricated.

⚠ WARNING

Never operate the engine without proper ventilation, exhaust fumes can be fatal when inhaled.

LUBRICATION

7.0 PROCEDURE

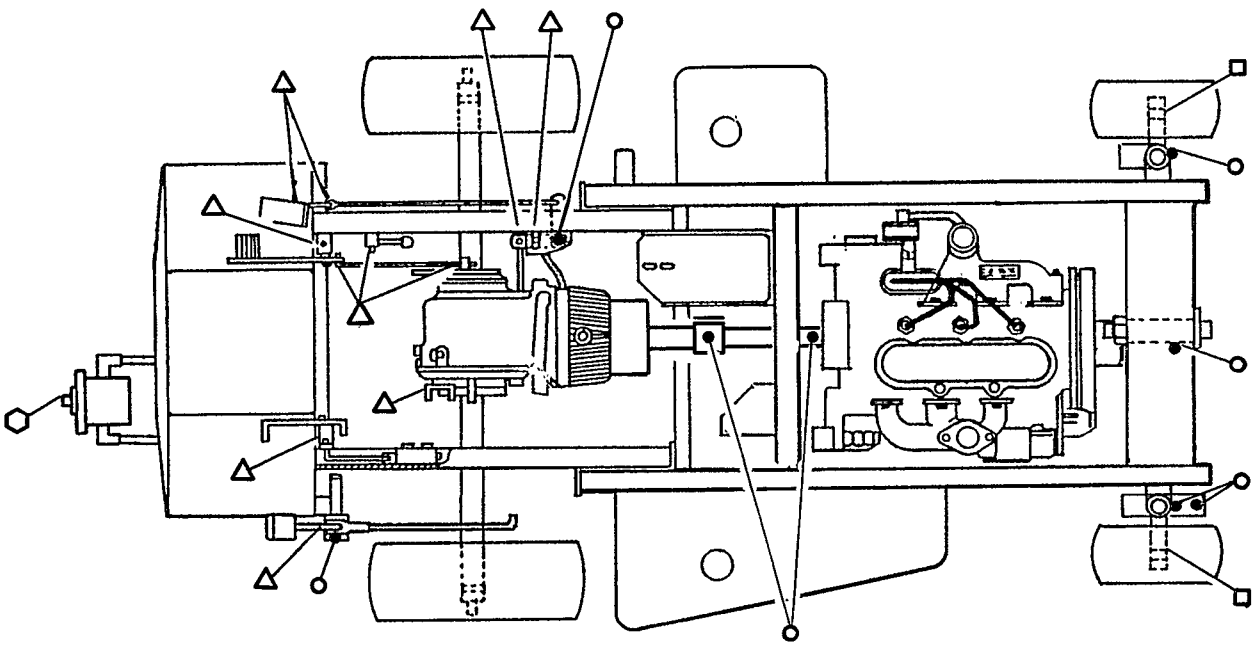
⚠ WARNING

Before you adjust, clean, or repair this equipment, disengage all drives, lower implements to the ground, engage parking brake, stop engine and remove key from ignition switch to prevent injuries.

Lubrication intervals are based on operating 8 hours per day, 5 days per week under normal conditions.

All lubrication maintenance intervals must be performed more frequently then specified when operating in extremely dusty conditions.

1. Always clean the grease fitting before and after lubricating. O
2. Apply grease with a manual grease gun and fill slowly. Do not use compressed air guns.
3. Lubricate with grease that meets or exceeds NLGI Grade LB specifications.
4. For smooth operation of pivot points and other friction points, apply several drops of SAE 30 wt., oil as required. △
5. Remove wheels and repack the bearings once a year. □
6. Coat motor shaft splines with Molydenum Disulfide E.P., lithium grease. ⬡



7.1 MAINTENANCE CHART

Recommended Intervals (Hours)												
	Daily	25	50	75	100	250	500	1000	Year	2 Years	Section	Lubricant
Air Filter	I								R		5.1A	
Battery						I					5.2-5.3-6.1	
Belts		I-A★				I-A					4.2	
Brake, Parking		I-A★				A					4.3	
Cooling System	I-C								R		5.15	V
Hoses and Clamps						I-A			R			
Engine Oil (Diesel)	I	R★		R							5.6	IV
Engine Oil (Gasoline) ●												
Engine Oil Filter (Diesel)		R★		R							5.6	
Engine Oil Filter (Gasoline) ●												
Friction Points			L								7.0-4	
Fuel System	I										5.7	II
Hoses and Clamps									R			
Fuel Filters (Diesel)							R				5.8	
Fuel Filters (Gasoline) ●												
Grease Fittings	L				L		L				7.0	I
Hydraulic Oil	I-A					R		R			5.11	III
Hydraulic Oil Filters (2)		R★				R					5.12	
Interlock System	I										4.6-4.9	
Muffler and Exhaust						I					5.14	
Radiator (Coolant)	I								R		5.15	V
Tires	I-A		I-A								5.17	
Transaxle							I-A		R		5.19	VI
Wheel Alignment		I★				I-A					4.11	
Wiring		I★				I					5.5	

A - Add or Adjust ***C – Clean*** ***I - Inspect*** ***L - Lubricate*** ***R – Replace*** ***AR - As Required***

● See Ford manual for specific maintenance intervals and lubricant specifications.

★ First maintenance period.

7.2 LUBRICANTS

I - Use pressure grease gun - (NLGI Grade LB). Apply with manual grease gun. Do not use compressed air guns.

II - Capacity: 8 gal., (30. 3L) #2 Diesel fuel, minimum rating: 45.

III - System capacity:
2-WD Tractors - 5 gal., (19 L) maximum.
4-WD Tractors - 6 gal., (23 L) maximum.
Jacobsen hydraulic oil. Part No. 5001405 carton containing two 2-1/2 gal., (9.5 L) bottles or Part No. 5001404, pail containing 5 gal., (19 L).

IV - Capacity, 3.5 qt. (3 L)
API Classification CC/CD/CE/Grade oil.
Above 77° (25° C) use SAE 30 or SAE 10W30
32° F to 77° F (0° - 25° C)use SAE 20 or SAE 10W30
Below 32° (0° C) use SAE 10 or SAE 10W30
Do not mix different brands or weights of oil

V - Capacity: 1.0 Gal., (3.8 L) Water and ethylene glycol.

VI - Capacity: 3.5 qt., (3.3 L) SAE90 weight oil.

DECALS

Familiarize yourself with the decals, they are critical to the safe operation of the machine. REPLACE DAMAGED DECALS IMMEDIATELY.

⚠ DANGER

To prevent injury:

- Always connect red battery cable to the positive (+) post **FIRST** and the black cable to negative (-) post **LAST**.
- When removing the battery, always remove, negative (-) cable **FIRST** and positive (+) cable **LAST**.
- Avoid contact with battery acid.
- Keep sparks and flames away from the battery.
- Do not short circuit battery posts. Do not touch frame or negative terminal when working on positive terminal.

⚠ CAUTION

To install the battery:

1. Install battery with terminals toward frame center.
2. Secure battery to support.
3. Connect positive (+) (red) FIRST.
4. Connect negative (-) (black) LAST.

To use jumper cable:

1. Stop the engine on vehicle with good battery.
2. Connect RED cable to positive (+) terminal on good battery and to positive (+) terminal on "discharged" battery.
3. Connect the BLACK cable from negative (-) terminal on good battery to frame of vehicle with discharged battery.
4. Start the engine.

336640

⚠ CAUTION

1. **Read operator's manual before operating machine.**
2. **Keep shields in place and hardware securely fastened.**
3. **Before you clean, adjust or repair this equipment, disengage all drives, engage parking brake and stop engine.**
4. **Keep hands, feet and clothing away from moving parts.**
5. **Never carry passengers.**
6. **Keep bystanders away.**

361854

⚠ CAUTION

DO NOT USE STARTING ASSIST FLUIDS.

Use of starting assist fluids in the air intake system may be potentially explosive or cause a "runaway" engine condition. This could result in serious engine damage and/or personal injury.

363134

⚠ WARNING

Radiator tube may exceed 150°F

364661

⚠ DANGER

TO AVOID POSSIBLE SERIOUS BODILY INJURY:

When operating vehicle without attachments, turn corners at a slow speed to reduce risk of vehicle tipping.

When on slopes and/or rough terrain or when making sharp turns run at reduced speeds. Lower attachment to ground when descending slopes to reduce risk of vehicle tipping.

Do not operate mower with bent or missing components or without discharge chute extension in place. Objects can be thrown very long distances, striking other persons and/or operator.

Do not operate blades with mower in raised position.

337509

⚠ PRECAUCION

1. **No opere esta maquina sin previo entrenamiento, instruccion y sin haber leido el manual de operacion.**
2. **Tenga todas las guardas en su lugar y piezas bien aseguradas.**
3. **Neutralice todas las velocidades y apague el motor antes de vaciar los recolectores de pasto, darle servicio, limpiar, ajustar y destrabar la maquina.**
4. **Mantenga las manos, los pies y ropa suelta lejos de piezas en movimiento.**
5. **No deberan transportar pasajeros si no existe un asiento para ellos.**
6. **Si no sabe leer ingles, pida que alguien le lea las calcomanias de avisos y los manuales de instruccion y operacion.**

340623

LIMITED WARRANTY

Product No. 66136 – T423D, 2 Wheel Drive Turfcat®
Product No. 66137 – T423D, 4 Wheel Drive Turfcat®
Product No. 66138 – T428D, 2 Wheel Drive Turfcat®
Product No. 66137 – T428D, 4 Wheel Drive Turfcat®
Product No. 66140 – T445G, 2 Wheel Drive Turfcat®

1. Warranty

Jacobsen Division of Textron Inc., (Jacobsen) warrants only to the original retail purchaser ("Warrantee") that this product shall be free from defects in material and workmanship for a period of two years (1500 hours) from the date of the first retail purchase. (90 days if used for rental purposes)

2. Items Not Warranted

Jacobsen makes no warranties or representations with respect to repairs performed by anyone other than an Authorized Jacobsen Distributor, or with respect to engines★, batteries, ROPS and tires, which are separately warranted by their respective manufacturers. Routine adjustments, normal wear and maintenance items are not covered by this warranty.

3. Conditions Which Will Void Warranty

A) The speed of the unit is increased beyond factory specifications or the product is modified in any way which would adversely affect its safety or performance;

B) The unit is not maintained or serviced in accordance with this publication;

C) The unit is abused, or is not used in its intended manner.

4. Exclusive Remedy

The warrantee's sole and exclusive remedy for breach of this warranty or any other defect or failure of the product, including any remedy provided by applicable federal or state law, statutory or common, is that Jacobsen will, at its sole option, repair or replace the product or any defective parts and cover the cost of labor associated with such repair or replacement. Transportation costs are not covered by this warranty.

5. How to Obtain Warranty Service

If warranty repair is necessary, contact an Authorized Jacobsen Distributor. All defective parts must be returned to the Distributor and become the property of Jacobsen.

6. Disclaimer

* *This warranty is made in lieu of all other warranties, implied or express, including any warranty of merchantability or fitness for a particular purpose.*

* *Jacobsen further disclaims any liability for incidental, direct or consequential damages, to include but not limited to, personal injury or property damage, arising from a breach of this warranty or any other defect or failure of the product to the extent allowed by law.*

No agent, employee or representative of Jacobsen, or any other person, has any authority to bind Jacobsen to any other affirmation, representation, or warranty concerning the goods sold under this Warranty.

For further information, call (414) 637-6711 or write to Jacobsen, Division of Textron Inc. at:

Warranty Department
1721 Packard Avenue
Racine, Wisconsin 53403-2564

★ The Kubota Engine is warranted by Jacobsen for a period of two years from the date of purchase.