



## OPERATORS MANUAL

### TRACTOR 520Y DIESEL



Manufactured by  
Tilmor LLC.  
Made in the USA  
Dalton, Ohio 44618

Original Operator's Manual

12-10004 Rev.03

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# INTRODUCTION

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Tilmor LLC. is pleased to provide you with your new Tilmor tractor!

Please visit our website, [www.tilmor.com](http://www.tilmor.com) for a complete list of available Tilmor products, and resources.

## Product Description

The Tilmor 520Y tractor is the ultimate row crop tractor for diversified farming operations. The Tilmor 520Y is highly adaptable to meet the needs of a multitude of crops and cultural practices.

## Intended Use

This tractor is designed solely for use in customary agricultural or similar operations. Use of the Tilmor 520 series tractor in any other manner is considered as contrary to the intended use.

## Why Do I Need an Operator's Manual?

This manual has been created to help you gain the important knowledge of what is needed to safely operate, maintain, and service your machine. It is divided into sections for convenient reference of the appropriate section.

You must read and understand the operator's manual for each piece of Tilmor equipment you own. Reading the operator's manual will help you become familiar with each specific piece of equipment. Understanding the operator's manual will help you, as well as others, avoid personal injury and/or damage to the equipment. Keep this manual with the machine at all times. The manual should remain with the machine even if it is sold. If this manual becomes damaged or unreadable, it should be replaced immediately. This manual is available on our website at [www.tilmor.com](http://www.tilmor.com)

When using a Tilmor attachment, be sure to read and follow the safety and operating instructions of both the power unit and the attachment being used to ensure the safest operation possible.

The information in this manual provides the operator with the safest procedures to operate the machine while getting the maximum use out of the unit. Failure to follow the safety precautions listed in this manual may result in personal injury and/or damage to the equipment.

## Replacement Parts

If any component of the 520 series tractor requires replacement, use only original Tilmor replacement parts. Tilmor replacement parts are available on our website at [www.tilmor.com](http://www.tilmor.com) or reach a customer service representative at 1-844-255-5864.

# INTRODUCTION

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## Using Your Manual

Throughout this manual, you will encounter special messages and symbols that identify potential safety concerns to help you as well as others avoid personal injury or damage to the equipment.

### SYMBOL DEFINITIONS



#### **ATTENTION**

This symbol identifies potential health and safety hazards. It marks safety precautions. Your safety and the safety of others is involved.

There are three signal words that describe the level of safety concern: Danger, Warning, and Caution. Safety should always be the #1 priority when working on or operating equipment. Accidents are more likely to occur when proper operating procedures are not followed or inexperienced operators are involved.

Note: Right-Hand and Left-Hand orientations may be referred to at different places throughout this manual. Right-Hand and Left-Hand is determined as if facing forward from the operator station.

### SIGNAL WORD DEFINITIONS

#### **DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme cases.

#### **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/or property damage. It may also be used to alert against unsafe practices.

## Manual Glossary

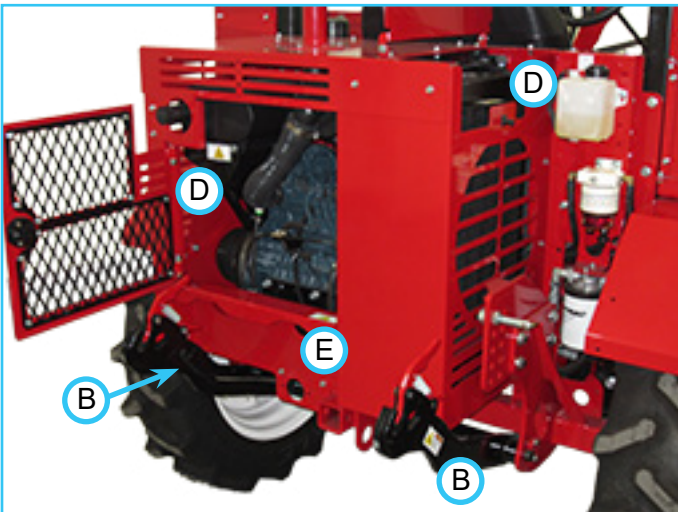
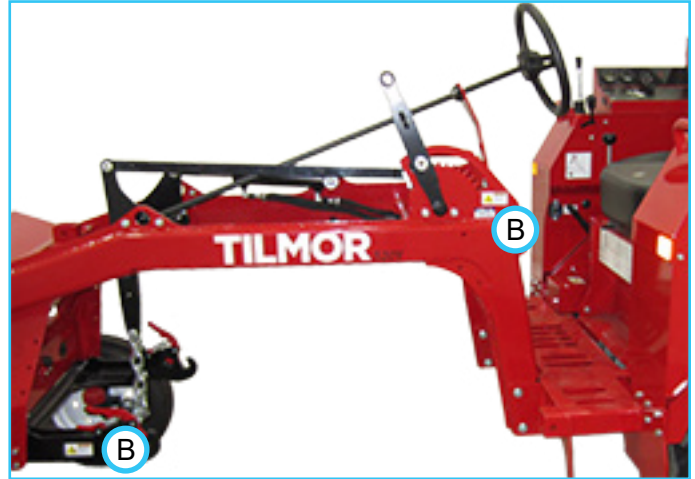
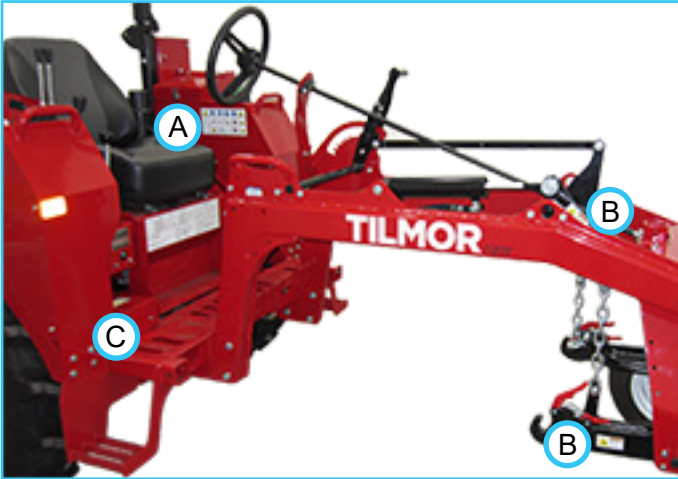
<b>Implement</b>	A piece of Tilmor equipment that requires a Tilmor tractor for operation.
<b>Accessory</b>	A device that attaches to a Tilmor tractor or Implement to extend its capabilities.
<b>Machine</b>	Describes any "Implement" or "Accessory" that is used in conjunction with a Tilmor tractor.

# SAFETY

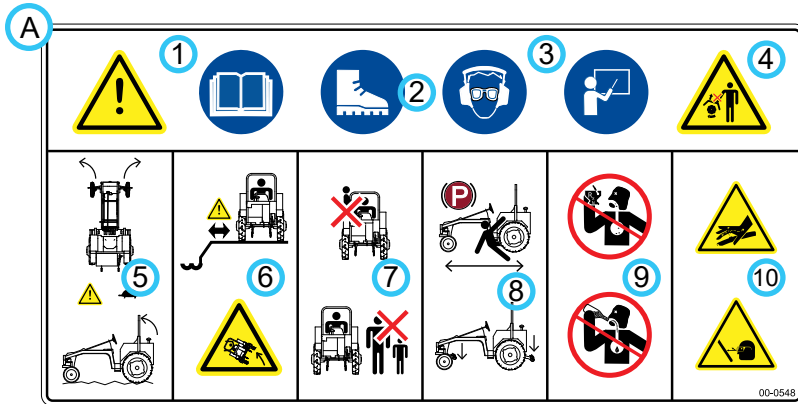
## Safety Decals

The following safety decals must be maintained on your Tilmor 520Y Tractor.

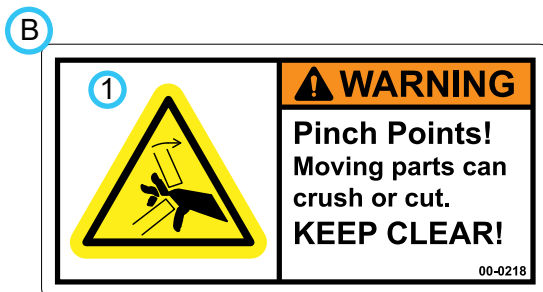
Keep all safety decals legible. Remove all grease, dirt, and debris from safety decals and instructional labels. If any decals are faded, illegible, or missing, visit [www.tilmor.com](http://www.tilmor.com) or call 1-844-255-5864 for replacements. When replacement or new components are installed, be sure that current safety decals are affixed to the replacement or new part.



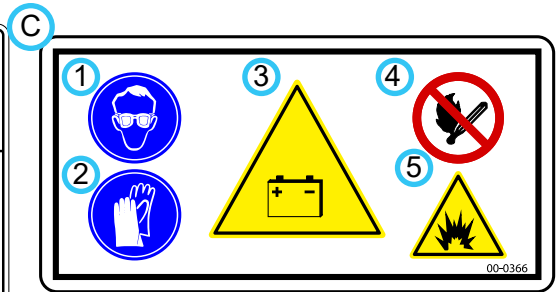
# SAFETY



1. Read the manual before operating the tractor.
2. Wear personal protective equipment, such as safety glasses, closed toe shoes or boots, and ear protection.
3. Operators must receive training prior to operating the machine.
4. Do not operate with shields or guards removed.
5. Slow down and use caution when turning the tractor. Operators must ensure that the ROPS is in the raised and locked position during operation.
6. **WARNING:** Keep a safe distance from the edge of drop-offs, ditches, and embankments. The machine could roll over if a wheel drops over the edge or if the edge caves in.
7. Do not carry passengers. Stop the machine if someone enters the area.
8. Set the parking brake and lower implements and shut off the engine before dismounting the tractor.
9. Do not operate while under the influence of drugs or alcohol.
10. **WARNING:** Hydraulic fluid is under high pressure and can penetrate skin, causing injury. Keep hands, face, and body away from pinholes or nozzles that eject hydraulic fluid under high pressure.



1. Cutting/crushing hazard - Stay away from moving parts.



1. Wear eye protection, such as goggles or a face shield, when checking or servicing batteries.
2. Wear appropriate protective gear, such as rubber gloves and an apron, when checking or servicing batteries.
3. **Danger:** Battery acid is caustic and can cause chemical burns. Keep bystanders a safe distance from the battery.
4. Do not expose batteries to arcs, sparks, or open flames. Do not use smoking materials near batteries.
5. **Explosion hazard** - batteries produce flammable and explosive gases.

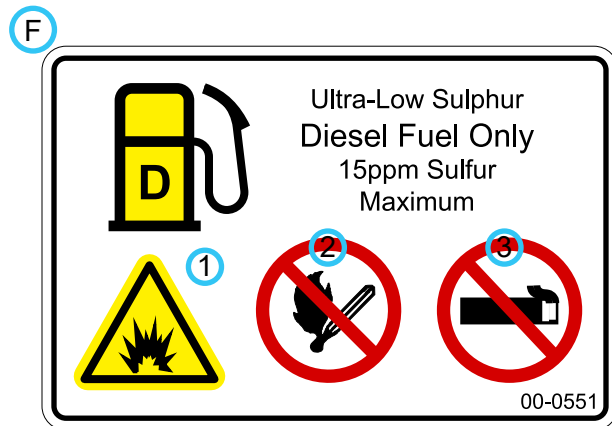


1. **Hot surface hazard** - Hot surfaces can cause severe burns. Allow engine, exhaust components, and surrounding surfaces to cool before servicing.

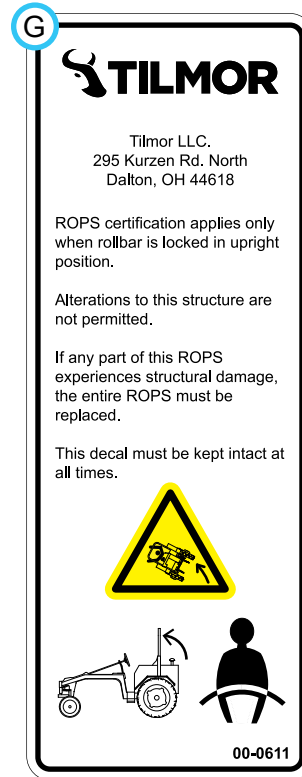
# SAFETY



1. Cutting/dismemberment/entanglement hazard - Stay away from moving parts.



1. DANGER: Explosion/Fire Hazard
2. Keep away from fire, sparks, and pilot lights when refueling or storing tractor and fuel.
3. Smoking is prohibited.



Decal	Description	Part Number	Quantity
A	Operator Safety	00-0548	1
B	Warning - Pinch Point	00-0218	6
C	Warning - Battery	00-0366	1
D	Warning - Hot Surface	00-0374	2
E	Warning - Fan	00-0341	1
F	Danger - Diesel Only	00-0551	1
G	ROPS Certification	00-0611	1

# SAFETY



## General Safety Procedures for Tilmor Tractors, Implements, & Accessories



### Training Required

- The owner of this machine is solely responsible for properly training the operators.
- The owner/operator is solely responsible for the operation of this machine and prevention of accidents or injuries occurring to him/herself, other people or property.
- Do not allow operation or service by children or untrained personnel. Local regulations may restrict the age of the operator.
- Before operating this machine, read the operator's manual and understand its contents.
- If the operator of the machine cannot understand this manual, then it is the responsibility of this machine's owner to fully explain the material within this manual to the operator.
- Learn and understand the use of all controls.
- Know how to stop the power unit and all attachments quickly in the event of an emergency.



### Personal Protective Equipment Requirements

It is the responsibility of the owner to be sure that the operators use the proper personal protective equipment while operating the machine. Required personal protective equipment includes, but is not limited to, the following list.



- Wear a certified ear protection device to prevent loss of hearing.
- Wear close fitting clothing and safety equipment appropriate for the job.
- Closed toe shoes must be worn at all times.
- When operating in dusty conditions, it is recommended that a dust mask must be worn.

### Operation Safety

- Inspect machine before operation. Repair or replace any damaged, worn or missing parts. Be sure guards and shields are in proper working condition and are secured in place. Make all necessary adjustments before operating the machine.
- Some pictures in this manual may show shields or covers opened or removed in order to clearly illustrate any instructions. Under no circumstance should the machine be operated without these devices in place.
- Alterations or modifications to this machine can reduce safety and could cause damage to the machine. Do not alter safety devices or operate with shields or covers removed.
- Before each use, verify that all controls function properly and inspect all safety devices. Do not operate if the controls or safety devices are not in proper working condition.
- Check parking brake function before operating. Repair or adjust the parking brake if necessary.
- Observe and follow all safety decals.
- All controls are to be operated from the operators station only.
- Always wear a seat belt if the machine has a roll cage/bar installed and in the upright position.
- Ensure the attachment or accessory is locked or fastened securely to the power unit before operating.
- Ensure that all bystanders are clear of the power unit and attachment before operating. Stop the machine if someone enters your work area.
- Always be alert to what is happening around you, but do not lose focus on the task you are performing. Always look in the direction the machine is moving.
- Look behind and down before backing up to be sure of a clear path.
- If you hit an object, stop and inspect the machine. Make all necessary repairs before operating the machine again.



# SAFETY



## General Safety Procedures for Tilmor Tractors, Implements, & Accessories



### Operation Safety (continued)

- Stop operation immediately at any sign of equipment failure. An unusual noise can be a warning of equipment failure or a sign that maintenance is required. Make all necessary repairs before operating the machine again.
- If equipped with a high/low range feature, never shift between high and low range while on a slope. Always move the machine to level ground and engage the parking brake before shifting range.
- Do not leave the machine unattended while it is running.
- Always park the machine on level ground.
- Always shutoff the engine when connecting a implement or accessory to the power unit.
- Never leave the operator's station without lowering the attachment to the ground, setting the parking brake, shutting off the engine, and removing the ignition key.
- Only operate in well lit conditions.
- Do not operate when there is a risk of lightning.
- Never direct the discharge of any implement or accessory in the direction of people, buildings, animals, vehicles, or other objects of value.
- Never discharge material against a wall or obstruction. Material may ricochet back towards the operator.
- Use extra caution when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Do not run the engine in a building without adequate ventilation.
- Do not touch the engine or the muffler while the engine is running or immediately after stopping the engine. These areas may be hot enough to cause a burn.
- Do not change the engine governor settings or over-speed the engine. Operating the engine at excessive speed may increase the hazard or personal injury.
- To reduce the hazard of fire, keep the battery compartment, engine, and muffler areas free of grass, leaves, excessive grease, and other flammable materials.

### Preventing Accidents



- Clear working area of objects that might be hit or thrown from machine.
- Keep people and pets out of the working area.
- Know the work area well before operation. Do not operate where traction or stability is questionable.
- Reduce speed when you are operating over rough ground.
- Equipment can cause serious injury and/or death when improperly used. Before operating, know and understand the operation and safety of the power unit and the attachment being used.
- Do not operate the machine if you are not in good physical and mental health, if you will be distracted by personal devices, or are under the influence of any substance which might impair decision, dexterity, or judgement.
- Children are attracted to machine activity. Be aware of children and do not allow them in the working area. Turn off the machine if a child enters the work area.



### Keep Riders Off

- Only allow the operator on the power unit. Keep riders off.
- Never allow riders on any attachment or accessory.





# SAFETY



## General Safety Procedures for Tilmor Tractors, Implements, & Accessories

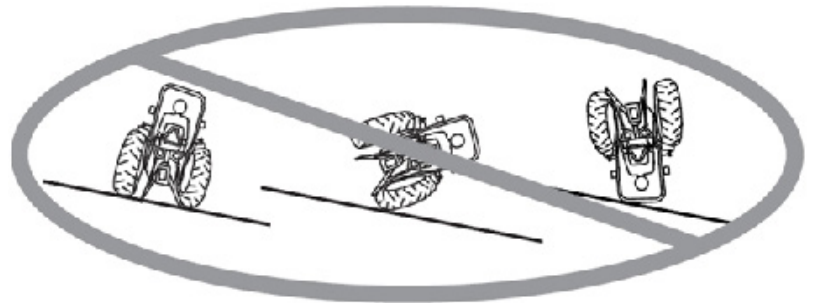


### Mounting and Dismounting the Tractor

- To prevent falling accidents always face the machine when mounting or dismounting. Maintain three points of contact with steps and hand holds.
- Never mount or dismount a moving machine.
- Use extra caution when slippery conditions may be present.
- Keep the steps clean and free of grease or oil.
- Never jump when dismounting the tractor.

### Use Caution On Slopes, Uneven Terrain, and Rough Ground

- Slopes, uneven terrain, and rough ground can cause loss-of-control and tip-over accidents, which can result in severe injury or death. Operating the tractor on slopes, uneven terrain, and rough ground requires extra caution.
- Avoid sharp up hill turns while on a slope.
- Choose a slow ground speed so you will not have to shift gears or stop on a slope.
- Make sure to move slowly and gradual on a slope, do not make any sudden changes in direction or speed.
- Avoid obstructions, ditches, and holes which may cause the tractor to become unstable or tip.
- Stay away from drop-offs, ditches, embankments, and bodies of water.
- Pulling loads on slopes decreases safety. It is the responsibility of the owner/operator to determine loads that can safely be controlled on slopes.
- Not all conditions in which a tractor could overturn are listed. Be aware of situations or conditions that could cause the tractor to become unstable.



### Roadway Safety

- Operate with safety lights when operating on or near roadways.
- Obey all state and local laws concerning operation on roadways.
- Slow down and be careful of traffic when operating near or crossing roadways. Stop before crossing roads or sidewalks. Use care when approaching areas or objects that may obscure vision.
- If there is doubt of safety conditions, discontinue machine operation until a time when operation can be performed safely.
- When operating near or on roadways, have a Slow Moving Vehicle Emblem clearly displayed.



### Truck or Trailer Transport

- Use care when loading or unloading machine on or into a truck or trailer.
- Use full width ramps for loading the machine on or into a truck or trailer.
- The parking brake is not sufficient to lock the machine during transport. Always secure the power unit and/or implement to the transporting vehicle securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.
- Shut off the fuel supply to the power unit during transport on truck or trailer.
- If equipped, turn the battery disconnect switch to the OFF position and shut off electrical power.

# SAFETY

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## General Safety Procedures for Tilmor Tractors, Implements, & Accessories



### Towing Loads

- Use caution when towing and stopping heavy loads. Stopping distance increases with speed and weight of towed loads.
- Towed loads with or without brakes that are too heavy for the tractor or are towed too fast can cause loss of control.
- Consider the total weight of equipment being towed.
- Before transporting a towed implement, reference the implement operators manual or look for decals on the implement that provide information on the implements transport speed.
- Never transport an implement at a speed that exceeds the implement's maximum transport speed.
- Ensure that a safety chain(s) are used when towing equipment. A safety chain will aid in controlling towed equipment if the equipment separates from the draw bar or hitch. The safety chain should only have enough slack in the chain to allow for turning.

### Maintenance Safety

- Keep all safety decals legible. Remove all grease dirt, and debris from safety decals and instructional labels.
- If any decals are faded, illegible, or missing, replacements can be obtained at [www.tilmor.com](http://www.tilmor.com).
- When new components are installed, be sure that current safety decals are affixed to the replacement components.
- If any component requires replacement, use only original Tilmor replacement parts.
- Always turn the battery disconnect to the OFF position or disconnect the battery before performing any repairs. Disconnect the negative terminal first and the positive terminal last. Reconnect the positive terminal first and the negative terminal last.
- Keep all bolts, nuts, screws, and other fasteners properly tightened.
- Always lower the attachment to the ground, engage parking brake, shut off engine, and remove the ignition key. Make sure all moving parts have come to a complete stop before cleaning, inspection, adjusting or repairing.
- Never perform maintenance on the power unit and/or attachment if someone is in the operator's station.
- Always use protective glasses when handling the battery.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- To reduce the hazard of fire, keep the battery compartment, engine, and muffler areas free of grass, leaves, and grease.
- Do not touch the engine, the muffler, or other exhaust components while the engine is running or immediately after stopping the engine. These areas may be hot enough to cause a burn.
- Allow the engine to cool before storing and do not store near an open flame.
- Do not change the engine governor settings or over-speed the engine. Operating engine at excessive speed may increase the hazard of personal injury.
- Springs may contain stored energy. Use caution when disengaging or removing springs and/or spring loaded components.
- An obstruction or blockage in a drive system or moving/rotating parts may cause a buildup of stored energy. When the obstruction or blockage is removed, the drive system or moving/rotating parts may move suddenly. Do not attempt to remove an obstruction or blockage with your hands. Keep hands, feet and clothing away from all power-driven parts.
- Dispose of all fluids in accordance with local laws.

# SAFETY



## General Safety Procedures for Tilmor Tractors, Implements, & Accessories

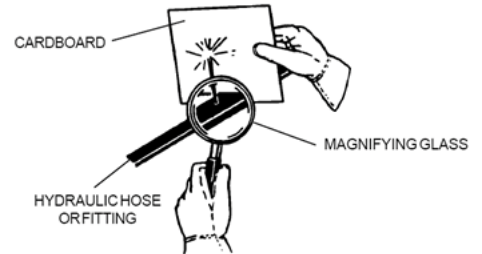


### Fuel Safety

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.
- Do not refuel the machine while smoking or at a location near flames or sparks.
- Always refuel the machine outdoors.
- Do not store machine or fuel container indoors where fumes or fuel can reach an open flame, spark, or pilot light.
- Only store fuel in an approved container. Keep out of reach of children.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove the machine from the truck or trailer and refuel it on the ground. If this is not possible, refuel the machine using a portable container, rather than from a fuel dispenser nozzle.
- Never remove the fuel cap or add fuel with the engine running. Allow the engine to cool before refueling.
- Replace all fuel tank and container caps securely.
- Do not overfill fuel tank. Only fill the bottom of the fuel neck, do not fill the fuel neck full. Overfilling of the fuel tank could result in engine flooding, fuel leakage from the tank, and/or damage to the emissions control system.
- If fuel is spilled, do not attempt to start the engine. Move the power unit away from the fuel spill and avoid creating any source of ignition until vapors have dissipated.
- If the fuel tank must be drained, it should be drained outdoors into an approved container.
- Dispose of all fluids in accordance with local laws.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- The fuel system is equipped with a shut-off valve. Shut off the fuel when transporting the machine to and from the job, when parking the machine indoors, or when servicing the fuel system.

### Hydraulic Safety

- Make sure all hydraulic connections are tight and all hydraulic hoses and tubes are in good condition. Repair any leaks and replace any damaged or deteriorated hoses or tubes before starting the machine.
- Hydraulic leaks can occur under high pressure. Hydraulic leaks require special care and attention.
- Use a piece of cardboard and a magnifying glass to locate suspected hydraulic leaks.
- Keep body and hands away from pinhole leaks or nozzles that eject high pressure hydraulic fluid. Hydraulic fluid escaping under high pressure can penetrate the skin causing serious injury, leading to severe complications and/or secondary infections if left untreated. If hydraulic fluid is injected into the skin, seek immediate medical attention no matter how minor the injury appears.
- The hydraulic system may contain stored energy. Before performing maintenance or repairs on the hydraulic system, remove attachments, engage the parking brake, disengage weight transfer system (if equipped), shut off the engine, and remove the ignition key.
- Dispose of all fluids in accordance with local laws.
- 



# SAFETY

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## 520Y Tractor Safety Procedures



### Roll Over Protective Structure (ROPS)

#### **WARNING**

Keep the ROPS locked in the upright position and the seat belt securely fastened during operation. Failure to do so could result in serious injury or loss of life.

#### **WARNING**

Alterations or modifications to this machine and/or the ROPS structure can reduce safety and could cause damage to the machine. Do not alter the ROPS. Do not alter any other safety devices.

Your power unit is equipped with a Roll-Over Protective Structure (ROPS). This ROPS was tested and certified in accordance with the following standards.

**ROPS:** ISO 5700:2013

**Seat Belt Anchorage:** ISO 3776-2

- ROPS certification applies only when the roll bar is locked in the upright position. Be aware there is no rollover protection when a folding ROPS is in the down position.
- DO NOT remove the ROPS. Alterations to the ROPS structure are not permitted.
- Lower the roll bar only when absolutely necessary and raise the roll bar to the upright position as soon as clearance allows. Never lower a folding ROPS in areas where there are slopes, drop offs, or water.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Always wear the seat belt when the roll bar is locked in the upright position. Be certain the seat belt can be released quickly in the event of an emergency.
- Do not wear a seat belt when the roll bar has been lowered to the down position.
- If any part of this ROPS experiences structural damage, the entire ROPS must be replaced.
- Inspect the seat belt for wear or damage before use. Failure to inspect or maintain the seat belt can cause injury or loss of life.

# SAFETY



## 520Y Tractor Safety Procedures



### California Proposition 65

#### **WARNING**

Operating, servicing, and maintaining off-road equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service equipment in a well ventilated area and wear gloves or wash your hands frequently when servicing your equipment.

For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)



#### **Attention**

It is a violation of California Public Resource Code Section 4442 to use or operate this engine on forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrestor maintained in effective working order. If your tractor is not equipped with a spark arrestor, visit [www.tilmor.com](http://www.tilmor.com) or call 1-844-255-5864 for the purchase of a spark arrestor.

### Operator Safety Interlock System

The Tilmor 520Y Tractor is equipped with a safety interlock system. This system:

- Prevents the engine from starting unless the operator is present in the seat.
- Prevents the engine from starting unless the transmission is in neutral.
- Shuts off the engine if the BPTO is engaged and the operator leaves the seat.

### Testing the Safety Interlock System

#### **WARNING**

Never operate the power unit if the safety interlock system is malfunctioning. Do not disengage or bypass any switch. Failure to observe this warning could result in injury to yourself and others, or damage to property and equipment.

#### **WARNING**

Ensure that the parking brake is set during the testing of the safety interlock system. Failure to observe this warning could result in injury to yourself and others, or damage to property and equipment.

#### **CAUTION**

The daily inspection should be performed prior to the initial startup for the day.

Perform the following safety interlock tests daily to test the electrical portion of the interlock system. Before testing, park the tractor on a level surface, set the parking brake, and place the high/low range shift lever in the neutral position. After testing is complete place the high/low shift lever in either high or low range, and set the parking brake.

# SAFETY



## 520Y Tractor Safety Procedures



### Testing the Safety Interlock System (continued)

**Tests 1-4** test the 'Engine Start' function. For each test, ensure that the parking brake is engaged and the high/low range shift lever is in the neutral position. As listed below for each test put the transmission in gear or neutral position, ensure there is or is not an operator present in the seat, and engage or disengage the BPTO if equipped.

ENGINE START	Test Number	Transmission in Neutral	Operator Present in Seat	BPTO Engaged if Equipped	Engine Starts
	1	No	Yes	No	No
	2	Yes	No	No	No
	3	Yes	Yes	Yes	No
	4	Yes	Yes	No	Yes

**Tests 5-8** test the 'Engine Run' function. For each test, ensure that the parking brake is engaged, the transmission is in the neutral position, and the high/low range shift lever is in the neutral position. For each test ensure that the engine is running. As listed for each test sit on the seat or raise body weight from the seat, and engage or disengage the BPTO. The engine should continue or stop running as described for each test.

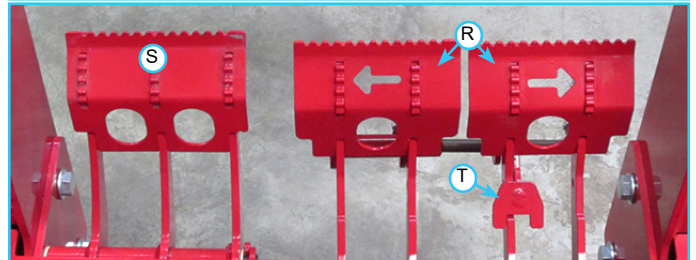
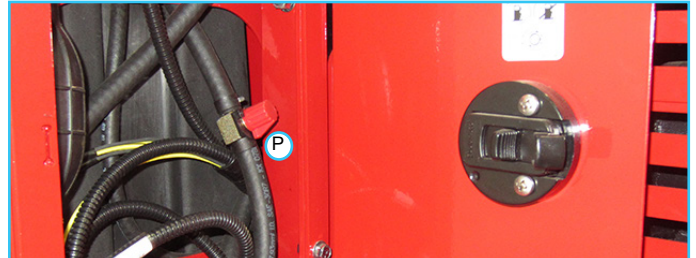
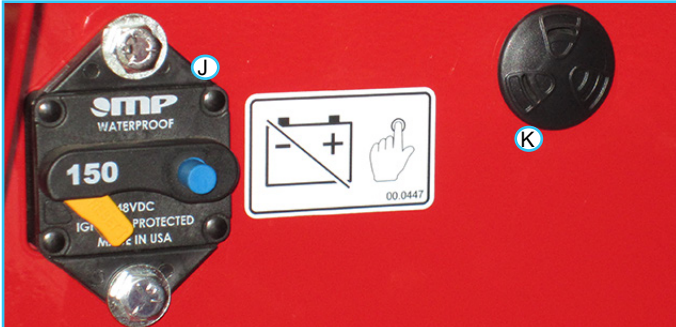
ENGINE RUN	Test Number	Operator Present in Seat	BPTO Engaged if Equipped	Engine Runs
	5	Yes	Yes	Yes
	6	No	Yes	No
	7	Yes	No	Yes
	8	No	No	Yes



# OPERATIONAL CONTROLS

## Standard Operational Control Locations

Use the following images to help identify the locations of operational controls. The letter next to each control can be referenced to the list that follows these images.



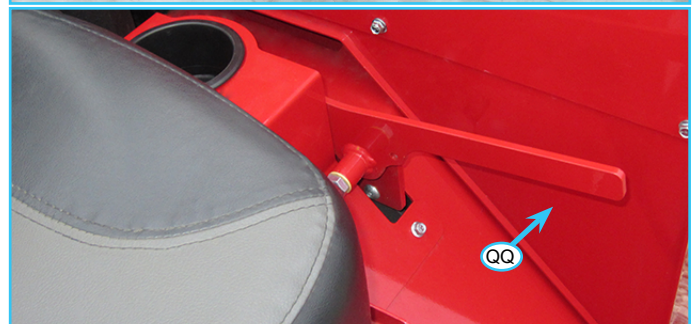
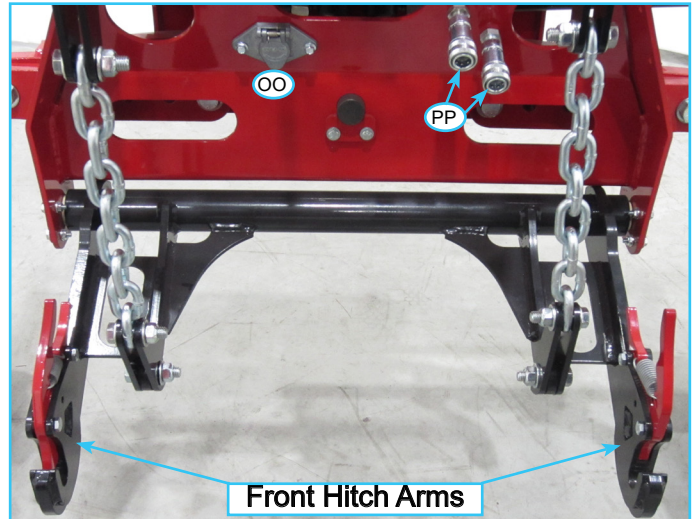
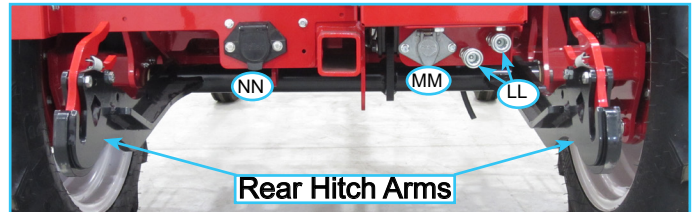
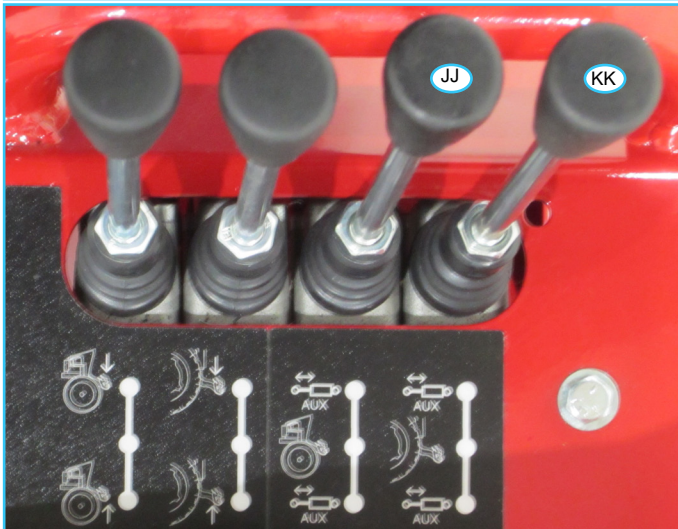
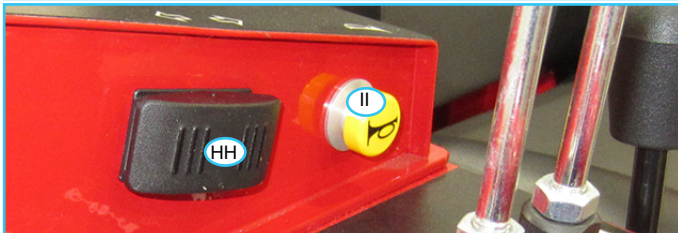
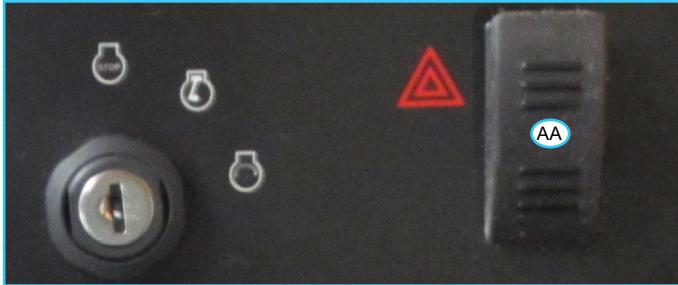
- A. Speedometer
- B. Tachometer
- C. Ignition Switch
- D. Throttle Lever
- E. 2 Speed Transmission High/Low Lever
- F. 4 Speed Transmission Gear Shift Lever
- G. Parking Brake Lever
- H. Front Hydraulic Control Lever
- I. Rear Hydraulic Control Lever
- J. Electrical System Circuit Breaker
- K. Warning Alarm
- L. Depth Control Handle
- M. Steering Wheel
- N. Seat Slide Lever
- O. Seat Latch Lever
- P. Fuel Shut Off Valve
- Q. USB Port
- R. Brake Pedals
- S. Clutch Pedal
- T. Brake Lock Pin



# OPERATIONAL CONTROLS

## Optional Operational Control Locations

Use the following images to help identify the locations of operational controls. The letter next to each control can be referenced to the list that follows these images.



- AA. Hazard Flasher Switch
- BB. Front Work Light Switch
- CC. Implement Light Switch
- DD. 12 Volt Front Switch
- EE. Mid Work Light Switch
- FF. Rear Work Light Switch
- GG. 12 Volt Rear Switch
- HH. Directional Signal Switch
- II. Horn Switch
- JJ. Front Auxiliary Hydraulic Control Lever
- KK. Rear Auxiliary Hydraulic Control Lever
- LL. Rear Auxiliary Hydraulic Quick Couplers
- MM. 12 Volt Rear 4 Pin Socket
- NN. 12 Volt 7 pin Socket
- OO. 12 Volt Front 4 pin Socket
- PP. Front Auxiliary Hydraulic Quick Couplers
- QQ. BPTO Control Handle



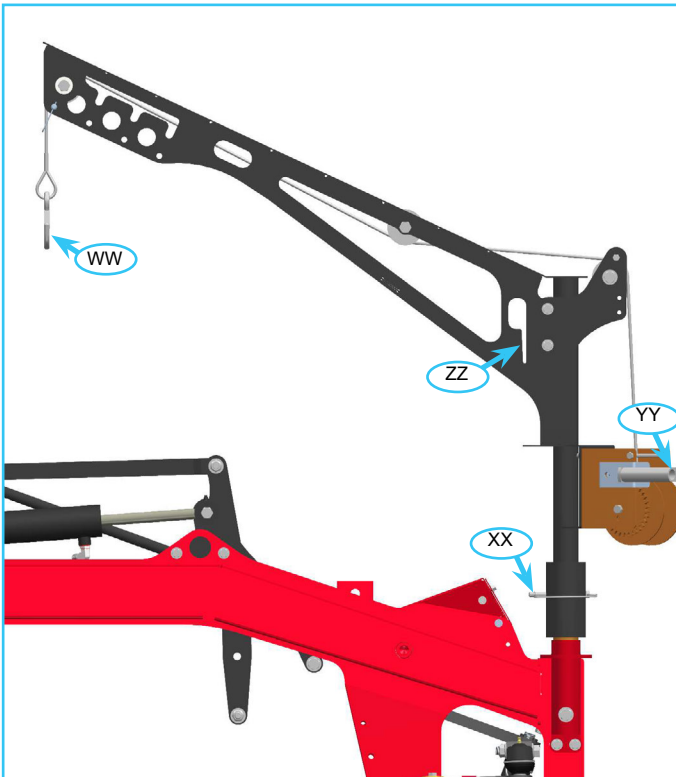
# OPERATIONAL CONTROLS

## Optional Operational Control Locations

Use the following images to help identify the locations of operational controls. The letter next to each control can be referenced to the list that follows these images.



- RR. Seat Slide Lever
- SS. Lumbar Support Knob
- TT. Seat Back Angle Adjustment Lever
- UU. Weight Adjustment Lever
- VV. Height Adjustable Backrest
- WW. Implement Hoist Hook
- XX. Hoist Retaining Pin
- YY. Winch Handle
- ZZ. Winch Handle Storage



# OPERATIONAL CONTROLS

## Speedometer Cluster Gauge (A)



The speedometer gauge contains a speedometer, BPTO indicator light, glow plug indicator light, and parking brake indicator light.

1. **Belt power take off (BPTO) indicator light** activates when the BPTO is engaged.
2. **Speedometer** displays the speed of the tractor. The speedometer can be set to display either miles per hour (MPH) or kilometers per hour (KPH).
3. **Glow plug indicator light** indicates the activation of the glow plugs for pre-heating the engine (diesel engine only). The glow plugs activate when the key is turned to the on position. When the glow plug light turns off, the engine is ready to start.
4. **Parking brake indicator light** activates when the parking brake is set.

## Tachometer Gauge Cluster (B)

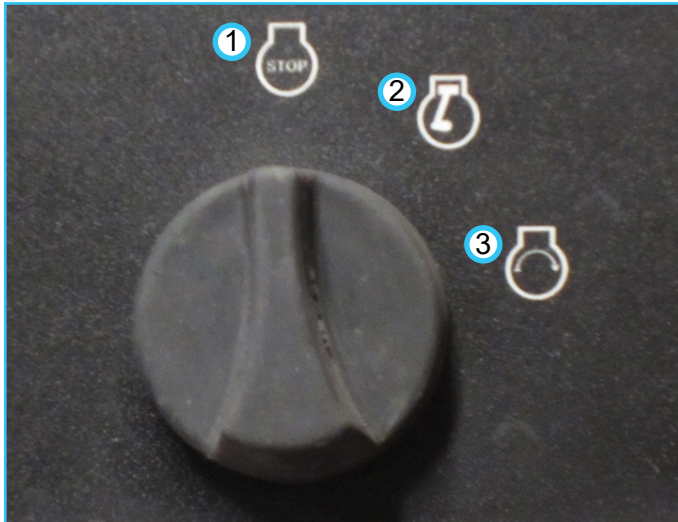


The tachometer gauge contains a water high temperature indicator light, tachometer, low voltage indicator light, and a low oil pressure indicator light.

1. **Water high temperature warning indicator light** activates when the temperature of the engine cooling system has reached an unsafe level. If this light comes on during operation, park the power unit, turn the PTO off, reduce the engine speed to low idle, and allow the engine to cool. Check the radiator screen and clean if necessary. If the engine temperature continues to rise, shut off the engine. If the engine continually overheats, refer to the troubleshooting section for possible problems.
2. **Tachometer** displays the engine speed in RPM. Also displays engine hours.
3. **Low voltage indicator light** activates when the voltage drops to an unacceptable level. If this light comes on, shut off any unnecessary lights and accessories to reduce the current draw. If voltage continues to drop, park the power unit, shut off the engine, and turn the ignition key to the off position. Refer to the troubleshooting section for possible problems.
4. **Low oil pressure indicator light** activates when the engine oil pressure is below a safe level. The light comes on when the ignition key is switched to the on position and stays illuminated until the engine is started and safe oil pressure develops. If this light comes on during operation, immediately shut off the engine. Do not restart the engine until the problem has been located and corrected.

# OPERATIONAL CONTROLS

## Ignition Switch (C)



1. Off or Stop Position - all 12 volt power going through the key switch is off
2. On or Run position - engine run position, 12 volt power is sent to accessories.
3. Start Position - when the key is turned to the start position the starter will be engaged.

## Throttle Lever (D)

1. Fast
2. Slow

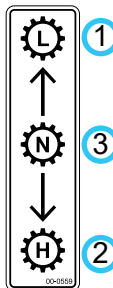
Moving the throttle lever forward toward the fast position increases the engine Revolutions Per Minute (RPM). Moving the throttle lever backward toward the slow position decreases the engine RPM.



## 2 Speed Transmission High/Low Range Shift Lever (E)

1. High range
2. Neutral
3. Low range

With the tractor parked on level ground, 4 speed transmission in neutral, and brakes applied, High or Low gear can be selected. Move the shifter to the middle of the shift stroke to place the transmission in neutral. Move the shifter forward and down to select low range. Move the shifter upward and back to select high range.



## 4 Speed Transmission Gear Shift Lever (F)

Provides four forward travel speeds and one reverse speed. Using the 4 speed gear shift lever and the 2 speed high/low range shift lever in different combinations provides eight forward speeds and two reverse speeds.



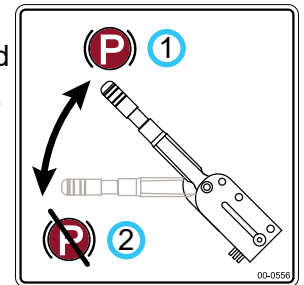
## Parking Brake (G)

1. Parking brake engaged
2. Parking brake disengaged

When parking the power unit, always engage the parking brake to prevent accidental movement of the machine.

To engage the parking brake, pull the handle upward and back toward the operator.

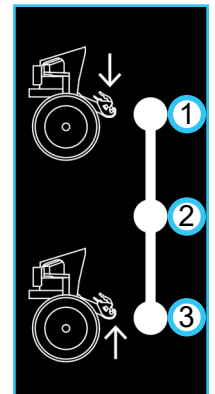
To disengage the parking brake, push the handle forward and down.



## Front Hydraulic Control Lever (H)

1. Lower
2. Hold
3. Lift

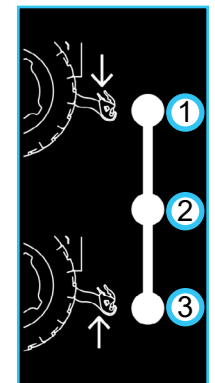
Moving the front hydraulic control lever forward lowers the front hitch points. Moving the front hydraulic control lever to the rear raises the hitch points.



## Rear Hydraulic Control Lever (I)

1. Lower
2. Hold
3. Lift

Moving the rear hydraulic control lever forward lowers the front hitch points. Moving the rear hydraulic control lever to the rear raises the hitch points.



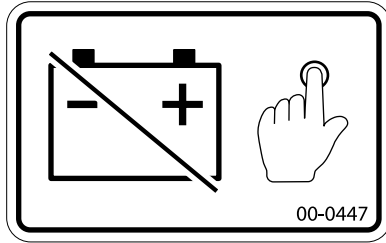


# OPERATIONAL CONTROLS

## Electrical System Circuit Breaker (J)

The circuit breaker/battery disconnect switch controls power to the entire electrical system. Pushing the button trips the circuit breaker disabling the electrical system,

allowing electrical components to be serviced. Moving the switch upwards engages the circuit breaker, energizing the electrical system.



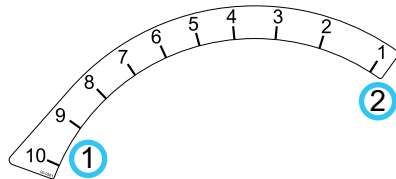
## Warning Alarm (K)

The warning alarm works with the tachometer gauge to alert the operator to problems. The warning alarm sounds a continuous signal whenever a warning is displayed on the tachometer gauge. If the warning alarm sounds, immediately check the tachometer gauge to determine the cause of the warning and then take appropriate action.

## Depth Control Handle (L)

1. Highest Position
2. Lowest Position

The depth control handle allows the implement to be incrementally raised or lowered by  $5/16"$ . Moving the depth control handle forward lowers the implement. Moving the depth control handle rearward raises the implement.



## Steering Wheel (M)

Turn the steering wheel to the left (counterclockwise) to turn the tractor to the left. Turn the wheel to the right (clockwise) to turn the tractor to the right.

## Seat Slide Lever (N)

Lift the seat slide lever to release the seat lock. Move the seat forward or backward to the desired position and release the seat slide lever to lock the seat in place.

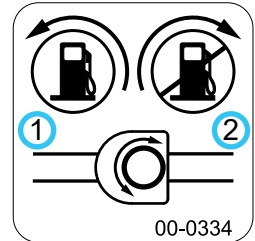
## Seat Latch Lever (O)

The seat latch lever secures the seat in place during operation. To release the seat pull the seat release handle forward while pulling the seat back forward.

## Fuel Shut-off Valve (P)

1. Fuel On
2. Fuel Off

The fuel shut-off valve controls the flow of fuel to the engine. Turning the valve counterclockwise to the stop allows fuel to flow to the engine. Turning the valve clockwise to the stop shuts off the flow of fuel to prevent fuel leakage when changing fuel filters or servicing the fuel system. Turn off the fuel shut-off valve when transporting the tractor on a truck or trailer and when parking the tractor indoors.



## USB Port (Q)

Allows the operator to charge a personal device such as a mobile phone during operation.

## Brake Pedals (R)

### CAUTION

Use caution when using the brake pedals independently. Using the brakes independently at a higher rate of speed could lead to accidental turning or tipping of the tractor.

The brake pedals are used together to stop the tractor. The Tilmor tractor is equipped with independent brake pedals for the left and right rear wheels. Using the pedals independently can allow the tractor to make tighter turns. The brake pedals must be locked together with the brake lock pin when the tractor is being operated at higher speeds.

## Clutch Pedal (S)

The clutch pedal controls the engagement or disengagement of the clutch providing power from the engine to the drivetrain. Pushing the clutch pedal in disengages the clutch. Letting the clutch pedal out engages the clutch providing power to the drivetrain.

## Brake Lock Pin (T)

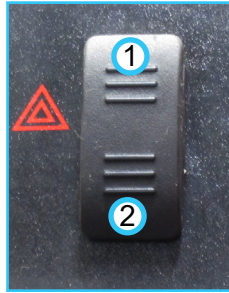
The brake lock pin locks the brake pedals together. With the pin lock engaged the brakes should stop the tractor in a straight line. Disengaging the pin will allow the brake pedals to work independently. Using the pedals independently can allow the tractor to make tighter turns. The brake pedals must be locked together when the tractor is being operated at higher speeds.

# OPERATIONAL CONTROLS

## Hazard Flasher Switch (AA)

1. On
2. Off

Depressing the top portion of the hazard switch flashes both directional turn signal lights. Depressing the bottom portion of the switch turns the hazard flashers off. Use of the directional turn signals will override the hazard flashers until the turn signals are turned off.



## Head Light Switch (BB)

1. On
2. Off

Depressing the top portion of the headlight switch turns on the headlights and tail lights. Depressing the bottom portion of the switch turns the lights off.



## Implement Light Switch (CC)

1. On
2. Off

Depressing the top portion of the implement light switch turns on the implement work lights. Depressing the bottom portion of the switch turns the implement work lights off.



## 12 Volt Front Switch (DD) and 4 Pin Socket (OO)

1. On
2. Off

The front 4-pin socket provides electrical power to implements that are equipped with electrical controls. The switch turns off and on the electrical power to the front 4-pin socket. Depressing the top portion of the switch turns on electrical power to the 4-pin socket. Depressing the bottom portion of the switch turns off electrical power.



## Front Work Light Switch (EE)

1. On
2. Off

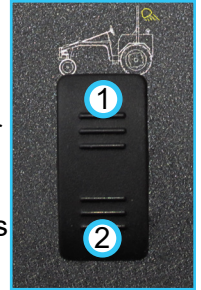
Depressing the top portion of the front work light switch turns on the front work lights. Depressing the bottom portion of the switch turns the front work lights off.



## Rear Work Light Switch (FF)

1. On
2. Off

Depressing the top portion of the rear light switch turns on the rear work lights. Depressing the bottom portion of the switch turns the rear work lights off.



## 12 Volt Rear Switch (GG) and 4 Pin Socket (MM)

1. On
2. Off

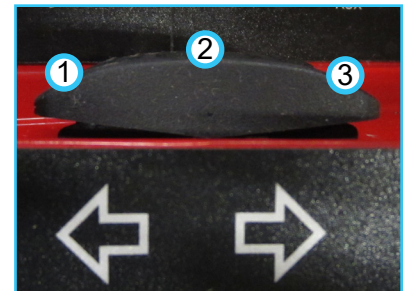
The rear 4-pin socket provides electrical power to rear mounted implements that are equipped with electrical controls. The switch turns off and on the electrical 4-pin socket. Depressing the top portion of the switch turns on electrical power to the front 4-pin socket. Depressing the bottom portion of the switch turns off electrical power.



## Directional Signal Switch (HH)

1. Left Signal On
2. No Signal On
3. Right Signal On

Depressing the left portion of the directional signal switch turns on the left turn signal. Depressing the right portion of the directional signal switch turns on the right turn signal. Return the switch to the middle position to turn off the signals. The left and right turn signals will override the hazard flashers.



# OPERATIONAL CONTROLS

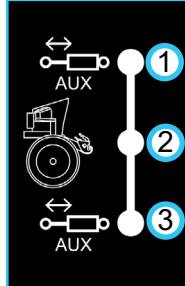
## Horn Switch (II)

Depressing the horn switch to sound the signal horn. The horn will sound until the horn switch is released.

## Front Auxiliary Hydraulic Control Lever (JJ)

1. Aux Hydraulic Couplers Direction #1
2. Aux Hydraulic Couplers Hold
3. Aux Hydraulic Couplers Direction #2

Moving the front hydraulic control lever forward or backward controls the auxiliary functions of mid mounted implements.



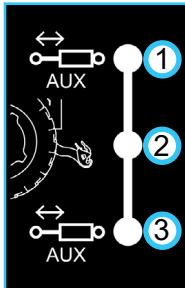
### CAUTION

The flow rate of implements connected to the auxiliary hydraulic should not exceed....

## Rear Auxiliary Hydraulic Control Lever (KK)

1. Aux Hydraulic Couplers Direction #1
2. Aux Hydraulic Couplers Hold
3. Aux Hydraulic Couplers Direction #2

Moving the rear hydraulic control lever forward or backward controls the auxiliary functions of rear mounted implements.



### CAUTION

The flow rate of implements connected to the auxiliary hydraulic should not exceed....

## Rear Auxiliary Quick Couplers (LL)

The rear auxiliary quick couplers are used to control auxiliary functions of rear mounted implements.

## 12 Volt 7 Pin Socket (NN)

The 12 volt 7-pin socket is used to provide power to a trailer for lighting.

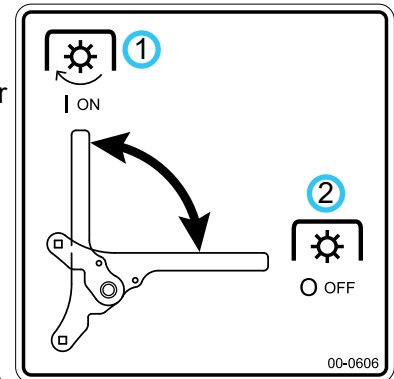
## Front Auxiliary Quick Couplers (PP)

The front auxiliary quick couplers are used to control auxiliary functions of mid mounted implements.

## BPTO Control Handle (QQ)

1. Engaged
2. Disengaged

The Belt driven Power Take Off provides power to belt driven implements mounted on the mid mount of the Tilmor tractor. Lift the BPTO handle upwards to engage the BPTO. Lower the BPTO handle to disengage the BPTO.



## Seat Slide Lever (RR)

Lift the seat slide lever to release the seat lock. Move the seat forward or backward to the desired position and release the seat slide lever to lock the seat in place.

## Lumbar Support Knob (SS)

The lumbar support knob adjusts the curvature of the backrest in either the upper or lower part of the backrest. Position 0 provides minimal support. Position 1 provides maximum curvature in the upper part of the backrest. Position 2 provides maximum curvature in the lower part of the backrest.

## Seat Back Angle Adjustment Lever (TT)

Lift up on the backrest angle lever to release the backrest catch. Move the backrest to the desired position and release the backrest angle lever to lock the backrest in place.

## Weight Adjustment Lever (UU)

The weight setting must be adjusted with the operator sitting on the seat. The weight setting should be checked and adjusted as necessary each time the power unit is operated. Fold the weight adjustment lever out and move it up or down to adjust the weight setting. The weight setting is correct when the arrow is in the middle of the viewing window. After adjusting the weight setting, fold the adjustment lever completely into the locking position.

## Height Adjustable Backrest (VV)

Allows the height of the backrest to be adjusted by moving the backrest up or down.

## Implement Hoist Hook (WW)

The implement hoist hook is used to connect the implement hoist cable to the lift bar of an implement.

# OPERATIONAL CONTROLS

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## **Hoist Retaining Pin (XX)**

The retaining pin secures the implement hoist in place on the tractor. The retaining pin should be installed at all times.

## **Winch Handle (YY)**

The winch handle is used to operate the hoist. Cranking the handle clockwise retracts the cable (lifts the implement). Cranking the handle counter-clockwise extends the cable (lowers the implement).

## **Winch Handle Storage (ZZ)**

When the handle is not in use the handle can be placed securely in this location.

# GENERAL OPERATION

## Daily Inspection

### **WARNING**

Always set the parking brake, shut off the tractor's engine, remove the ignition key, and ensure all moving parts have come to a complete stop before inspecting components, or attempting any repair or adjustment.

1. Park the tractor on a level surface, with the engine off and all fluids cold.
2. Perform a visual inspection of the tractor. Look for loose or missing hardware, damaged components, or signs of wear.
3. Inspect the ROPS structure and seat belt for damage or signs of wear.
4. Inspect the battery, electrical connections, and lights.
5. Ensure the parking brake tension is properly adjusted.
6. Inspect the hydraulic hoses, hydraulic fittings, and fuel lines to ensure tight, leak free connections.
7. Inspect all belts for damage or excessive wear. Replace the belts as required.
8. Check the tractor's engine oil level, hydraulic oil level, coolant level, and fuel level. Add fluid or service as required.
9. Ensure the radiator screen (if equipped), air cleaner, and engine compartment are clean.
10. Check the tires for proper inflation.
11. Test the operator safety interlock system. The test is available in the Testing the Operator Safety Interlock section of this manual.

## Starting The Engine

### **CAUTION**

Do not use ether or starting fluids. Use of starting fluids in the air intake system may be potentially explosive or cause a runaway engine condition. Use of starting fluids could result in engine damage and/or personal injury.

The Tilmor 520 tractor is equipped with an interlock system for operator safety. The safety interlock system requires the tractor transmission to be in the neutral position, and an operator to be seated on the tractor.

1. Turn the fuel shut-off valve to the on position.
2. Turn the battery disconnect switch to the on position.
3. Disengage the BPTO if equipped.
4. Lower the any mid or rear mounted implements to the ground.
5. Place the transmission in the neutral position.
6. Move the throttle lever just past the half throttle position.
7. Turn the ignition key to the run position to activate the glow plugs for preheating the combustion chamber. When the glow plug indicator light turns off, the engine is ready to start. If the engine is at operating temperature, the engine does not need to be pre-heated. If the ambient temperature is below 23° F (-5° C), the pre-heating cycle may need to be repeated prior to starting.

### **CAUTION**

Do not run the electric starter continuously for more than 10 seconds. If the engine does not start right away, wait 30 seconds and try again.

8. Turn the ignition key to the start position and hold to engage the starter. Release the key when the engine starts. NOTE: If the engine fails to start, refer to the troubleshooting section.

## Idling The Engine

1. Adjust the throttle to set the engine speed at slow idle.
2. Set the parking brake.
3. Place the transmission in neutral.

## Starting A Stalled Engine

1. Disengage the BPTO if equipped.
2. Move the transmission to the neutral position.
3. Start the engine.

## Shutting Off The Engine

1. Park the tractor on a level surface and set the parking brake.
2. Move the throttle lever to the slow idle position.
3. Allow the engine to idle for 3-5 minutes.
4. Turn the ignition key to the off position.
5. If parking the tractor for an extended period of time, press the battery circuit breaker button to disconnect battery power and turn the fuel shut-off valve to the off position.



# GENERAL OPERATION

## Driving The Tractor

### CAUTION

The tractor must be at a complete stop before shifting the two speed transmission. Failure to stop the tractor before shifting between high and low range can result in damage to equipment.

1. Start the engine.
2. Place the two speed transmission in High or Low range as required.
3. Disengage the parking brake.
4. Depress the clutch pedal.
5. Adjust the throttle as required.
6. Move the transmission gear shift lever to the desired gear. Using the gear shift lever and high low range shift lever in different combinations, eight forward speeds and two reverse speeds can be selected.

### CAUTION

Ensure that the clutch pedal is depressed when shifting the gear lever. Failure to depress the clutch when shifting gears can result in damage to equipment.

7. Release the clutch pedal gradually to begin movement.
8. Adjust the throttle as required to maintain a constant operating speed.

## Stopping The Tractor

1. Park the tractor on a level surface.
2. Disengage the BPTO if equipped.
3. Depress the clutch.
4. Depress both brake pedals evenly.
5. Apply the parking brake.
6. Place the transmission in the neutral gear position.
7. Move the throttle lever to the slow idle position.
8. Allow the engine to idle for 3-5 minutes.
9. Turn the ignition key to the off position.
10. If parking the tractor for an extended period of time, press the battery circuit breaker button to disconnect battery power and turn the fuel shut-off valve to the off position.

## Emergency Stopping The Tractor

1. Depress the clutch
2. Depress both brake pedals evenly.
3. Turn the ignition key to the off position.
4. Set the parking brake.
5. Do not leave the operators station before all moving parts have stopped moving.

## Mid Mount Hitch

The mid mount hitch has a maximum load capacity of 450 lbs (204 kg). The hitch is used to secure implements to the tractor, and to be able to raise and lower the implements. The mid mount hitch is controlled by the front hydraulic control lever and the depth control handle. Set the desired depth using the depth control handle. Using the front hydraulic control lever adjust the hitch arms so that the depth control handle chain is taught.

## Mid Mount Hitch Attaching

1. Insure that the hitch arm latches are locked open.
2. Lower the hitch arms to the lowest position.
3. Align the implement or tool bar mounting locations with the hitch arms.
4. Raise the hitch arms until the implement lift pins are fully seated in the hitch arm mounting location.
5. Close the hitch arm latches ensuring the implement or tool bar is securely locked in place.

## Depth Control Lever

The depth control handle allows the implement to be incrementally raised or lowered by 5/16". Moving the depth control handle forward lowers the implement. Moving the depth control handle rearward raises the implement. The depth control handle setting prevents the implement from being lowered any further by the mid mount hitch hydraulic control.

## Rear Hitch

The rear mount hitch has a maximum load capacity of 500 lbs (226 kg). The hitch is used to secure implements to the tractor, and to be able to raise and lower the implements. The rear mount hitch is controlled by the rear hydraulic control lever.

## Rear Hitch Attaching

1. Insure that the hitch arm latches are locked open.
2. Lower the hitch arms to the lowest position.
3. Align the implement or tool bar mounting locations with the hitch arms.
4. Raise the hitch arms until the implement lift pins are fully seated in the hitch arm mounting location.

# GENERAL OPERATION

5. Close the hitch arm latches ensuring the implement or tool bar is securely locked in place.

## Implement Hoist

The implement hoist aids in positioning an implement or attachment to be mounted on the mid mount of the Tilmor tractor.

### ⚠ WARNING

Avoid crushing and related injuries. Do not work on, under or around a loaded hoist. Immediately transfer and secure the implement or tool to the tractor. Keep all hands, feet, and other body parts out from under the raised implement or tool until it has been secured to the tractor or placed on the ground.

### ⚠ CAUTION

The maximum lift capacity of the hoist is 450 lbs (226 kg). Do not exceed the maximum weight limit of the hoist. Exceeding the limit could result in injury or damage to equipment.

### ⚠ CAUTION

If using an electric drill, do not connect the drill chuck directly to the winch shaft. Attach the drill with 5/8" socket on the hex shaft. To minimize heat build up and possible winch damage, do not exceed 600 RPM.

## Belt Drive PTO (BPTO)

The belt driven power take off provides power to belt driven implements mounted on the mid mount of the Tilmor tractor. Lift the BPTO handle upwards to engage the BPTO. Lower the BPTO handle to disengage the BPTO. The BPTO is integrated into the safety interlock system. If the BPTO is engaged the engine will not start. If the Operator is not present in the operators seat and the BPTO is engaged the engine will shut off.

## Tractor Track Width Adjustment

The track width of the Tilmor 520 series tractor is adjustable from 50" on center to 78" on center in 2" increments.

The following steps will explain how to adjust the track width of the tractors front axle.

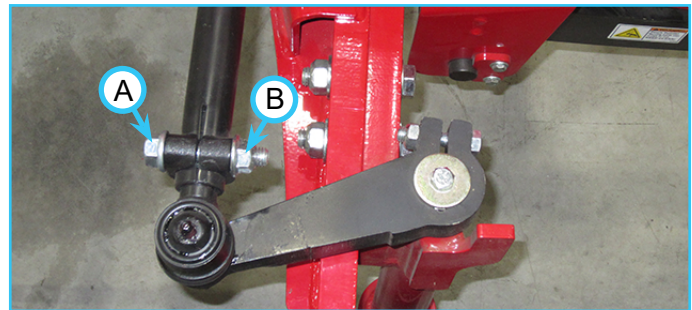
Lift the front of the tractor so that the front wheels are approximately 2" off of the ground using a hoist or high lift jack.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.

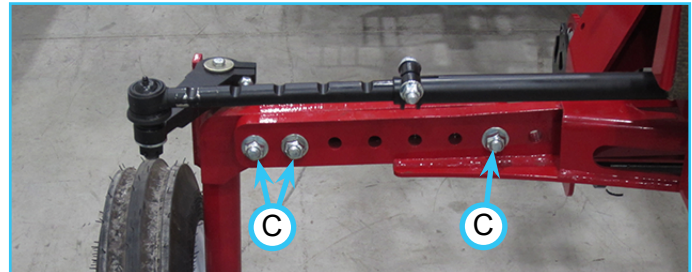
### ⚠ WARNING

Ensure that the tractor is securely supported when the wheels are lifted off of the ground. Failure to secure the tractor properly can result in personal injury or death.

4. Using a high lift jack, hoist, or other safe method lift the front of the tractor off of the ground
5. Remove the 1/2" bolt (A) and nut (B) from the tie rod link.



6. Remove the three 5/8" bolts (C) and nuts securing the axle in place.

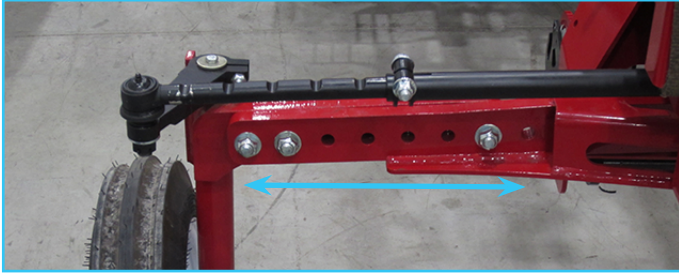


### Attention

All three bolts must be installed in the axle, Two bolts must be installed at the widest location.

7. Adjust the axle in or out to the desired width.

# GENERAL OPERATION



8. Install the three mounting bolts to secure the axle in place.
9. Torque the three 5/8" bolts to 151 ft-lbs (205 Nm).



## Attention

Ensure that the wheel is aligned straight forward.

10. Install the 1/2" bolt and nut through the tie rod link.
11. Torque the bolt to 75 ft-lbs (102 Nm).
12. Adjust the other side of the front axle in the same manner as required.

The following steps will explain how to adjust the track width of the tractor's rear axle. Each wheel has multiple adjustments within the wheel and dish.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.



## WARNING

Ensure that the tractor is securely supported when the wheels are lifted off of the ground. Failure to secure the tractor properly can result in personal injury or death.

4. Using a jack and jack stands lift the rear of the tractor, raising the rear wheel approximately 2 inches off of the ground.
5. Remove the wheel from the tractor.
6. Reference the chart below to reach the desired track width for your Tilmor tractor.

Wheel Offset	Track Width	Rim Orientation*	Dish Orientation**	Rim Flange Mounting Surface***
-3	50"	OUT	IN	OUT
-1	54"	OUT	IN	IN
1	58"	IN	IN	OUT
3	62"	IN	IN	IN
5	66"	OUT	OUT	OUT
7	70"	OUT	OUT	IN
9	74"	IN	OUT	OUT
11	78"	IN	OUT	IN

\* RIM ORIENTATION IS BASED ON THE LOCATION OF THE VALVE STEM. IF THE VALVE STEM IS ORIENTED AWAY FROM THE TRACTOR THE RIM ORIENTATION IS OUT. IF THE VALVE STEM IS ORIENTED TOWARD THE TRACTOR THE RIM ORIENTATION IS IN.

\*\* DISH ORIENTATION IS BASED ON THE SIDE OF THE DISH MOUNTED TO THE HUB. IF THE DISH IS MOUNTED TO THE HUB INSIDE THE CONCAVE PORTION OF THE DISH THE DISH IS IN. IF THE DISH IS MOUNTED TO THE HUB WITH THE CONCAVE PORTION AWAY FROM THE HUB THE DISH IS OUT.

\*\*\*RIM FLANGE MOUNTING SURFACE IS BASED ON THE SIDE OF THE FLANGE TO WHICH THE DISH IS BOLTED. IF THE DISH IS MOUNTED TO THE FACE OF THE FLANGE ORIENTED INSIDE TOWARD THE TRACTOR THE FLANGE MOUNTING SURFACE IS IN. IF THE DISH IS MOUNTED TO THE FACE OF THE FLANGE ORIENTED OUTWARD AWAY FROM THE TRACTOR THE FLANGE MOUNTING SURFACE IS OUT.

# GENERAL OPERATION

## Ballast

Adding ballast to the front or rear of the tractor can greatly impact the performance and productivity of the tractor.

Add weights to the front or rear of the tractor as needed (not to exceed hitch or axle load capacities) to improve traction and give the tractor more stability.

Load Capacities	
Front Axle	980 lbs (444 kg)
Rear Axle	3,200 lbs (1451 kg)
Mid Mount Hitch	450 lbs (204 kg)
Rear Hitch	500 lbs (226 kg)
Maximum Tractor Weight	4000 lbs (1814 kg)

Operating use and implements being used will determine the ballast location and the amount of ballast required.

- Ensure that enough ballast is used on the front of the tractor to ensure sufficient weight for steering.
- When changing implements it may be necessary to change ballast locations and amount of ballast.
- Remove ballast when it is no longer needed.

## Driving the Tractor on Roads

Before operating the tractor on a public road or highway, ensure that the tractor is equipped with working headlights, tail lights, turn signals, and flashing warning lights. Reference local regulations regarding equipment lighting and marking requirements.

- Ensure that lighting is clean and unobstructed.
- Repair or replace any damaged lighting and markings.

### CAUTION

The Tilmor 520 series tractor is designed for off road use only. The tractor can be equipped with a road package (AT-9077). The road package consists of emergency lights, tail lights, headlights, horn, and a slow moving vehicle sign.

1. Turn on the tractor headlights. Ensure that the headlights are adjusted properly and tail lights are illuminated.

2. Use turn signals when turning. Ensure the turn signal switch is returned to the center position after turning is complete.
3. Ensure that the brake pedals are locked together before operating the tractor on a road.
4. Maintain control of the tractor at all times. Slow down when encountering hills, turns, and rough ground.
5. Shift to a lower gear when going down hill to control the speed of the tractor without using the brakes. Never allow the tractor to coast downhill.
6. Use caution when transporting rear mounted equipment.
7. Ensure rear mounted equipment has lighting and markings in accordance with local regulations.
8. Ensure the tractor has proper ballasting before operating on a public road or highway.

## Towing

The Tilmor 520 series tractor is capable of towing loads up to 2000 lbs (907 kg). The receiver style hitch has a maximum static vertical load capacity of 500 lbs.

When towing loads it is important to ensure that:

1. The receiver hitch pin is secure.
2. Safety chains shall be used.
3. Inspect towed equipment to ensure it is in proper working order.
4. Ensure that towed equipment has proper lighting and markings in accordance with local regulations.
5. Stopping distances are increased.
6. Maintain control of the tractor at all times. Slow down when encountering hills, turns, and rough ground.
7. Shift to a lower gear when going down hill to control the speed of the tractor without using the brakes. Never allow the tractor to coast downhill.
8. Use caution when towing loads over adverse surface conditions.



# SERVICE

## ⚠ WARNING

Always set the parking brake, shut off the tractor's engine, remove the ignition key, and ensure all moving parts have come to a complete stop before inspecting components, or attempting any repair or adjustment.

### Service And General Maintenance

Proper and timely service of this tractor is critical to keep the tractor in a safe and reliable operating condition. Follow the maintenance schedule at the end of this section.



## Attention

If any component requires replacement, use only original Tilmor replacement parts.

If any component of the 520 series tractor requires replacement, use only original Tilmor replacement parts. Tilmor replacement parts are available on our website at [www.tilmor.com](http://www.tilmor.com) or reach a customer service representative at 1-844-255-5864.

### Cleaning And Appearance Care

For best results, and to maintain the finish of the power unit, clean or wash the power unit to remove accumulated dirt and debris when the job is finished.

## ⚠ CAUTION

If the engine has been running, it must be allowed to cool in order to prevent damage to the block and exhaust manifold.

Do not direct high pressure water at the engine, air cleaner, muffler, radiator, or any electrical components.

Allow the tractor and all components to cool before washing. Refer to the specific service sections for proper cleaning techniques for the engine, and radiator. Use mild soap and water to clean the tractor. Harsh chemical cleaners could cause damage to the finish or components.

After cleaning, use touch-up paint to repair any scrapes.

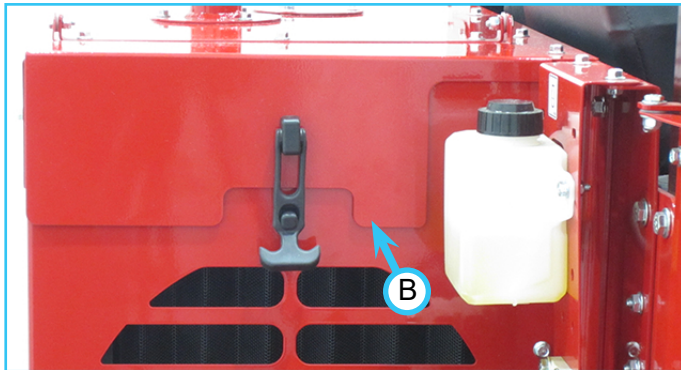
### Service Access Points

Throughout the service section, different access points are referred to. The following list and images identify shields and covers that may need to be removed or opened during service.

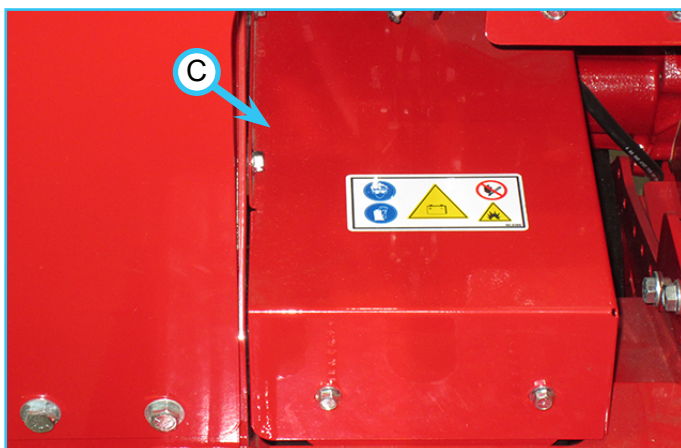
1. Engine Access Cover (A).



2. Radiator Access Cover (B).



3. Battery Cover (C).



# SERVICE

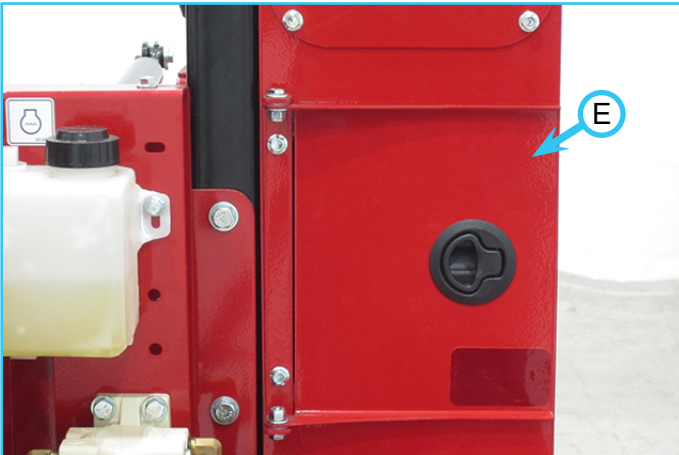
4. Seat (D).



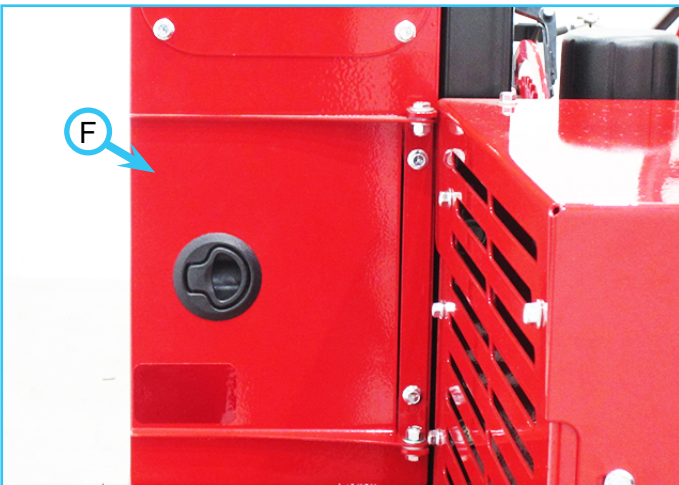
7. Brake Master Cylinder Access Panel (G).



5. Fuse Panel Access Cover (E).



6. Fuel Shut Off Valve Access Cover (F).





# SERVICE

## Lubrication Locations

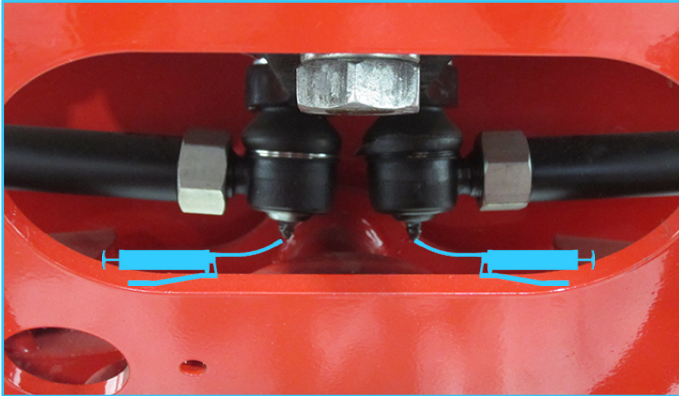
Lubrication is required at the following locations. Refer to the maintenance schedule for service intervals and amount of grease.

Refer to the Specification section for grease type.

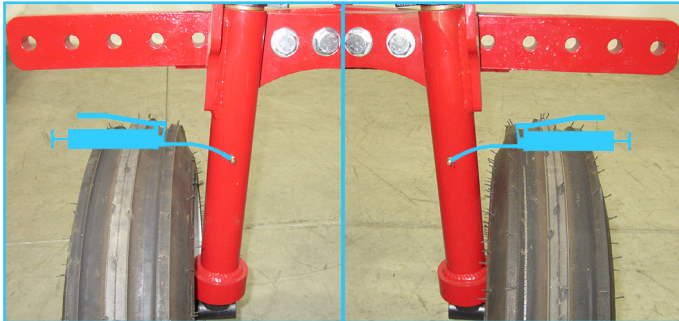
### 1. Outer Tie Rods



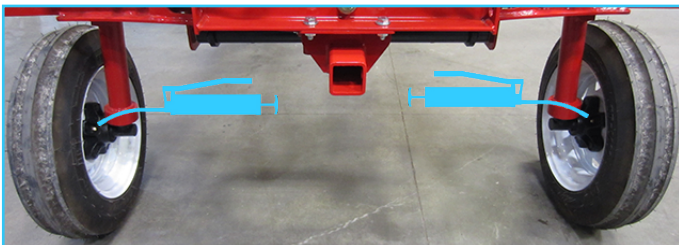
### 2. Inner Tie Rods



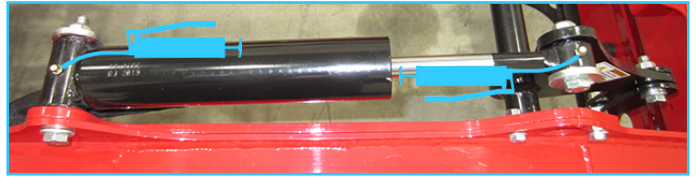
### 3. Front Axle Pivot Tube Left and Right



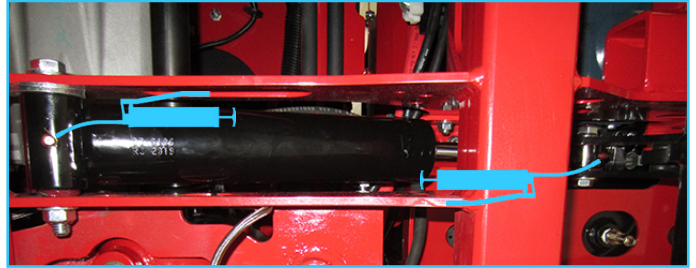
### 4. Front Wheel Hubs



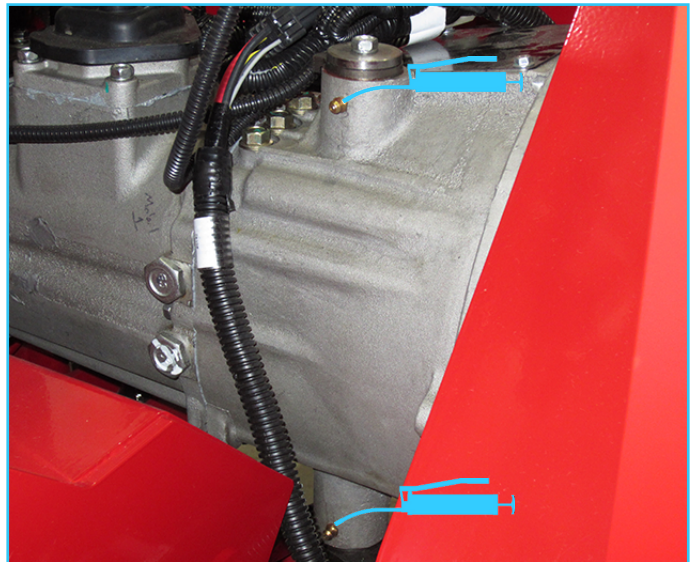
### 5. Front Hitch Cylinder



### 6. Rear Hitch Cylinder



### 7. Transmission



# SERVICE

## Checking Hydraulic Fluid Level

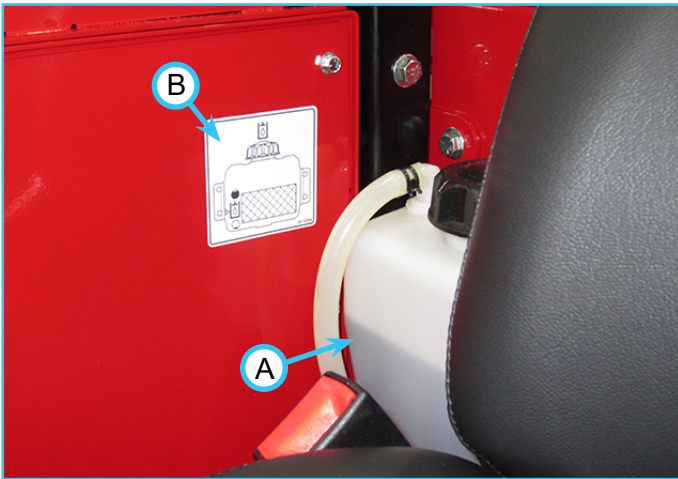
Check the hydraulic fluid level when the hydraulic system is cold, prior to operating the tractor. If the hydraulic system is warm, allow one hour for the hydraulic system to cool before checking the fluid level. Checking the fluid level when the hydraulic system is warm will produce an inaccurate fluid level reading.



### Attention

After connecting a new implement or kit that runs off the tractors hydraulic system, run the implement through a complete cycle, then stop and check the hydraulic Fluid level.

1. Park the tractor on a level surface.
2. Fully raise the front hitch and raise the rear hitch.
3. Engage the parking brake and shut off the engine.
4. Remove the key from the ignition switch and allow the hydraulic system time to cool.
5. The hydraulic fluid tank (A) is mounted to the right of the operators seat. Check the oil level in the reservoir. The fluid level should be within the proper range indicated by the fluid level decal (B) mounted on the operator console to the left of the hydraulic fluid tank.



### Attention

The recommended hydraulic fluid is Mobifluid 424. See the Specification section of this manual for more information.

6. If the hydraulic fluid level is below the low mark on the decal, add hydraulic fluid to the reservoir until the proper level is reached.

## Checking Engine Oil Level



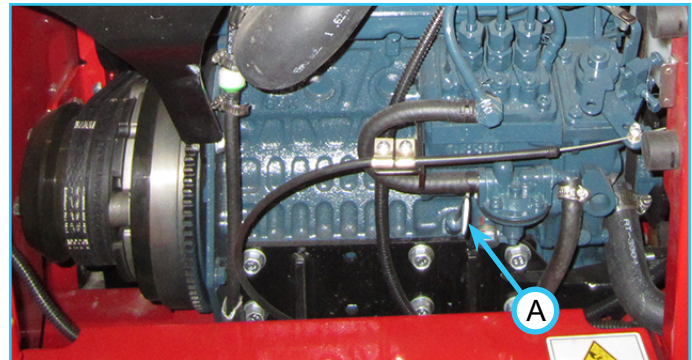
### Attention

#### Avoid Engine Damage!

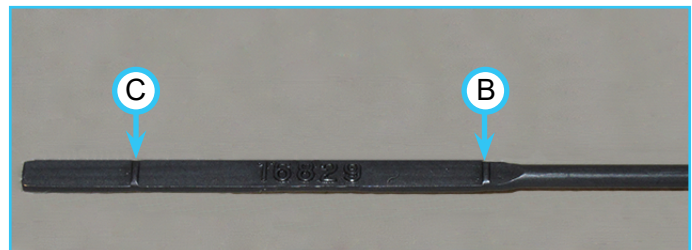
Failure to check the oil level regularly could lead to serious damage to your engine, if the engine is run with an incorrect oil level.

- Check the engine oil level with the power unit sitting on a level surface and with the engine shut off and the oil cold.
- Keep the oil level between the **FULL** and **ADD** marks.
- Do not add oil with the engine running.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine and oil to cool.
4. Open the engine access door.
5. Remove the oil dipstick (A) from the engine and wipe with a clean cloth.



6. Insert the dipstick back into the engine and remove again.
7. Check the oil level. The level should be between the Full (B) and Add (C) marks on the dipstick.





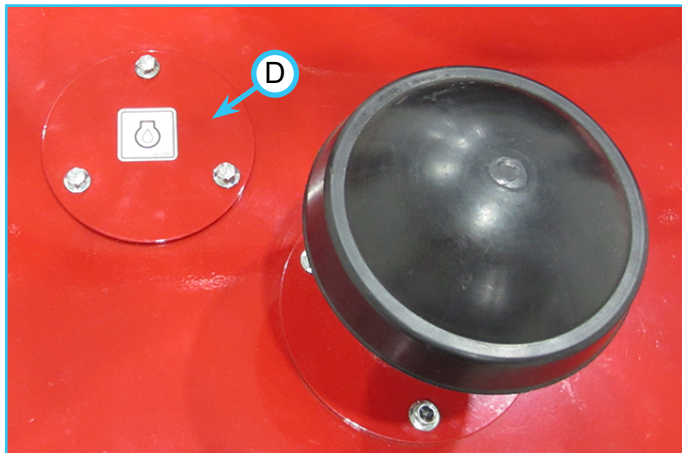
# SERVICE



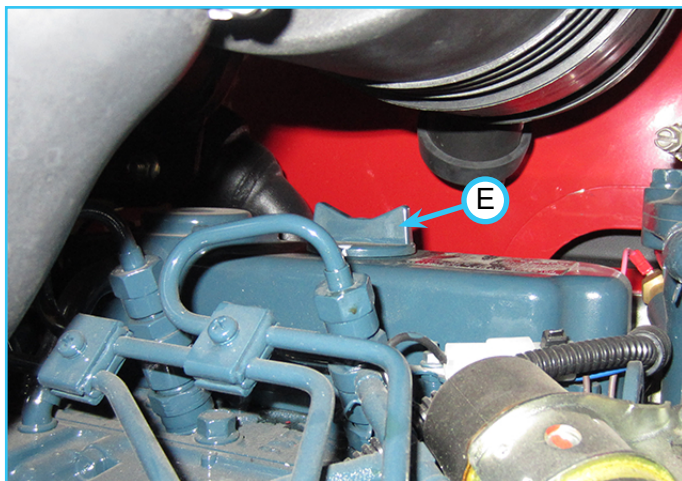
## Attention

The recommended engine oil is Mobil Delvac Extreme 10W-30. See the Specification section of this manual for more information.

8. If the oil level is low, remove the oil fill cap access panel (D).



9. Remove the oil fill cap (E) and add small amounts of engine oil to bring the oil level no higher than the full level on the dipstick.



10. If the oil level is above the full level, drain some engine oil to achieve the proper level on the dipstick.
11. Reinstall the dipstick and oil fill cap.
12. Reinstall the oil fill cap access panel. Torque the three 1/4" bolts to 100 in-lbs (11 Nm).
13. Close the engine access door securely.

## Changing Air Filter Elements



## CAUTION

When the air filter elements are removed, an opening is created to the internal parts of the engine.

Be sure nothing falls into the canister that could make its way into the engine. Have the new filter elements ready to install immediately after removing the old filter elements.



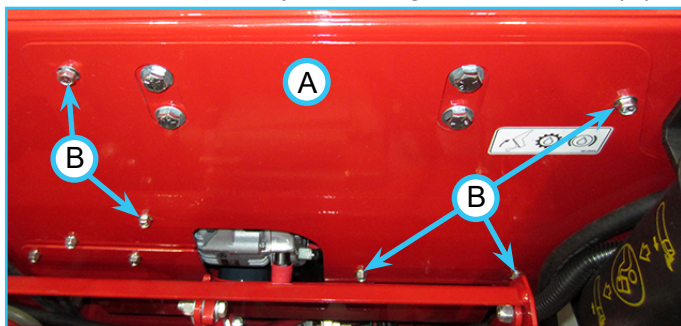
## Attention

Avoid damage to your engine!

Improper service to the engine air filter can result in severe engine damage.

- Inspect the filter daily in extreme heat, dust, or other severe conditions.
- Never run the engine without a proper air filter installed.
- Never wash or clean the paper filter element.

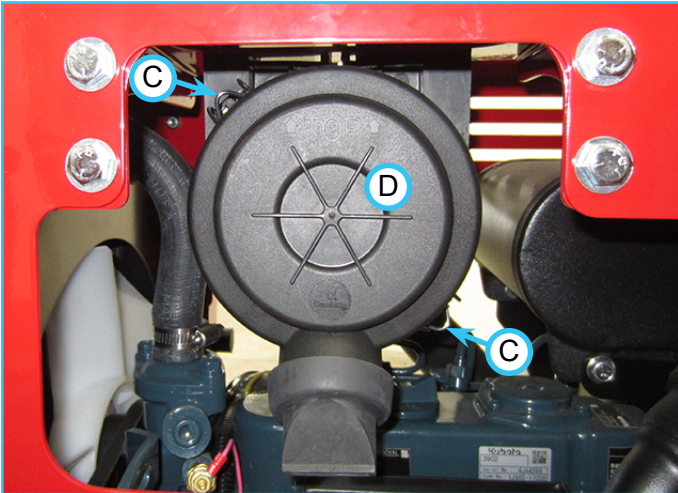
1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Remove the engine access panel (A) located behind the seat by removing five 1/4" bolts (B).



5. Locate the engine air cleaner assembly.

# SERVICE

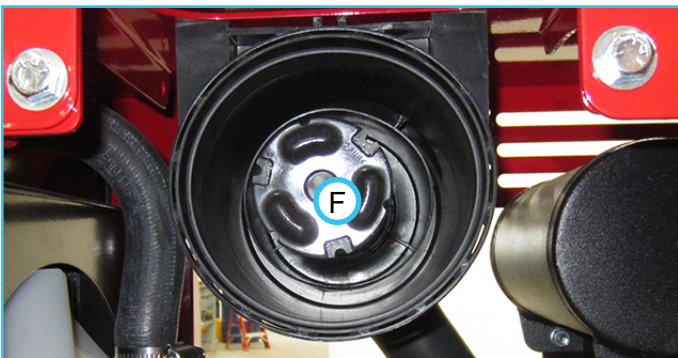
6. Release both latches (C) on the filter assembly and unhook the latches from the filter housing.



7. Remove the filter cap (D).  
8. Remove and discard the primary air filter element (E).



9. If the safety air element (F) is scheduled for replacement, remove and discard the safety air filter element.



10. Install the new air filter element(s).  
11. Install the filler cap and securely fasten both latches.  
12. Install the engine access panel torque the 1/4" bolts to 100 in-lbs (11 Nm).

## Checking The Cooling System

### ⚠ WARNING

#### Avoid Personal Injury

If the unit has been running, the radiator and radiator coolant will be hot and can burn skin! Built-up pressure in the radiator can cause an explosive release of coolant if the radiator cap is removed:

- Shut off the engine and allow to cool.
- Do not remove the radiator cap unless the radiator and engine are cool enough to touch with bare hands.
- Slowly loosen the cap to the first stop to release all the pressure before removing completely.

### ⚠ WARNING

#### Avoid Personal Injury

Wear personal protective equipment to protect eyes and hands when opening the radiator cap to protect against the pressure in the radiator. If coolant is spilled on skin or clothing, change clothing and wash affected skin immediately.

### ⚠ CAUTION

Coolant is poisonous to humans and animals and is hazardous to the environment. Drain coolant into an approved container. Dispose of used coolant in accordance with local laws.



### Attention

#### Avoid damage to your engine!

Using incorrect coolant mixture and/or type can cause engine damage. Use only a mixture of 50% distilled water and 50% ethylene glycol antifreeze.

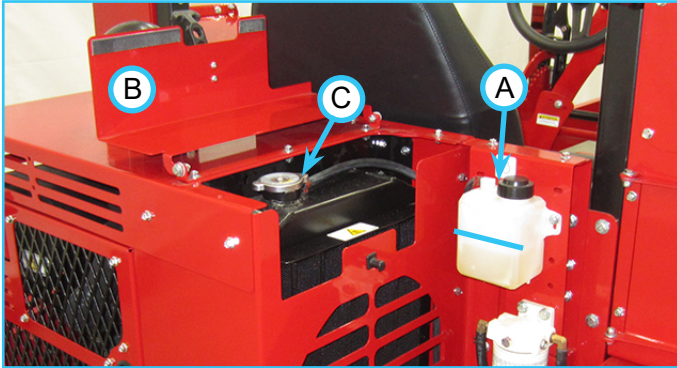
Recommended antifreeze: a low silicate, phosphate free antifreeze (ethylene glycol) containing supplemental coolant additives (SCA's) to inhibit corrosion and rust.

Dye color does not determine antifreeze properties; ethylene glycol antifreeze of different colors can be mixed.



# SERVICE

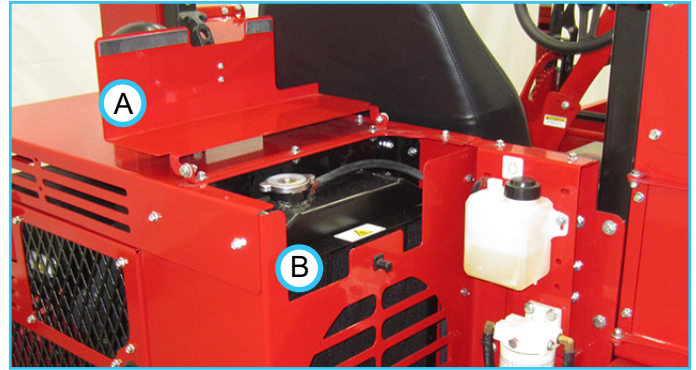
1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Check the coolant level in the recovery reservoir (A). When cold the coolant recovery tank should be approximately half full of coolant.



5. If the coolant level is low, add coolant to the reservoir and reinstall the cap.
6. If the coolant recovery reservoir is empty, access the radiator through the radiator access cover (B).
7. Slowly open the radiator cap (C) to the first stop to allow any pressure to release. Press down on the cap slightly and continue to turn counter clockwise to remove the cap from the radiator.
8. Check to ensure the coolant level is up to the bottom of the filler neck.
9. If the coolant level is low, add coolant to the radiator until it reaches the bottom of the filler neck.
10. Install the radiator cap.
11. Inspect the radiator hoses and clamps for leaks and deterioration. Replace as necessary.
12. Close the radiator access panel.

## Cleaning The Radiator and Screen

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Open the radiator access cover (A).



5. Remove the radiator screen (B).
6. Remove debris from the radiator screen using a brush, compressed air, or water.
7. When required, clean debris from the radiator using low pressure compressed air or water.
8. Check radiator fins for damage.
9. Install the radiator screen
10. Close and secure the radiator access cover.

# SERVICE

## Filling The Fuel Tank

### DANGER

Fuel is flammable and/or explosive. Follow all safety instructions in the Fuel Safety section of this manual and in the engine operators manual.

### WARNING

Long term exposure to fuel vapors can cause serious injury or illness. Avoid prolonged breathing of fuel vapors. If fuel is spilled on skin or clothing, change clothing and wash affected skin immediately.

### CAUTION

Avoid damage to your engine!

Only use fuel that meets the specifications required for your engine. Refer to the engine operator's manual for the proper grade and specifications of fuel for your engine.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. The fuel tank cap is located on the left rear fender. Wipe any dust and dirt off the fuel cap to prevent dirt from falling into the fuel tank, and remove the fuel cap.

### CAUTION

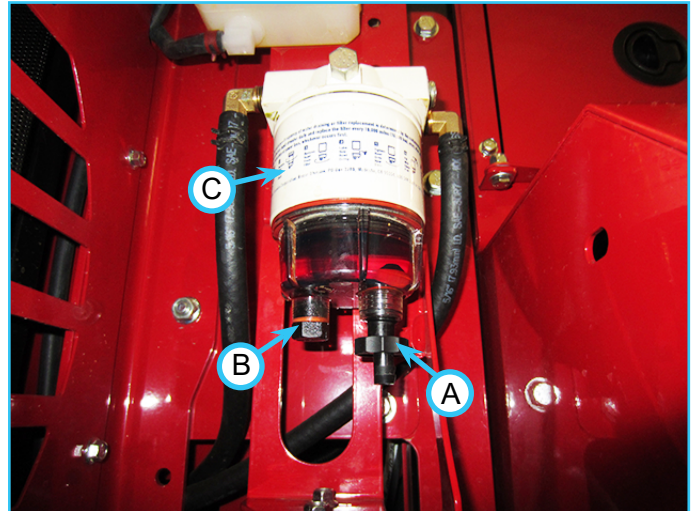
If the tractor will not be used after filling the fuel tank, only fill the fuel tank to within 1" (25 mm) of the bottom of the fuel neck to allow room for fuel expansion from temperature changes. Failure to do so may cause engine flooding, fuel leakage from the tank, and/or damage to the emissions control system.

5. Add fuel to the tank until the fuel reaches the bottom of the fuel neck. Do not overfill by filling the fuel neck, as this may cause engine flooding, fuel leakage from the tank, and/or damage to the emissions control system. Keep the fuel nozzle in contact with the rim of the fuel neck until fueling is complete. Replace the fuel cap and tighten.
6. Wipe up any fuel spills and allow fuel vapors to dissipate before starting the engine.

## Fuel Filter / Water Separator

Water and sediment can be observed through the glass bowl on the bottom of the filter.

1. Drain water through the valve (A).
2. Remove sediments through the plug opening (B).



### Changing the filter:

1. Turn the fuel shut-off valve to the Off position.
2. Remove the fuel filter canister (C).
3. Replace the fuel filter and reinstall the fuel filter canister.
4. Turn the fuel shut-off valve to the On position.
5. Prime the fuel system, if necessary.

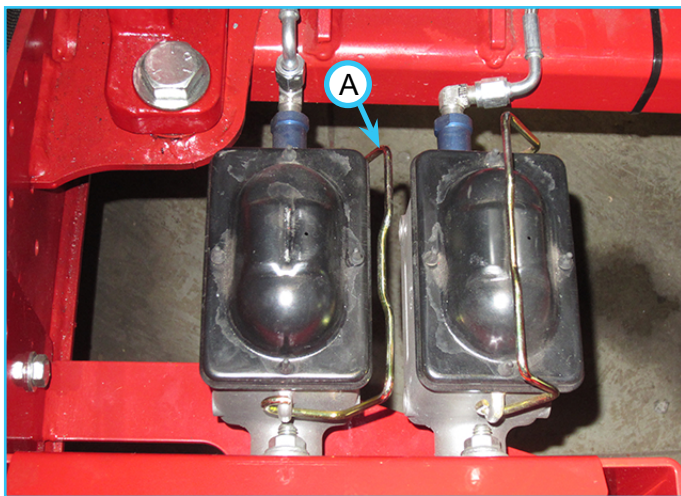
### Priming The Fuel System

1. Turn the ignition key to the On position for about 30 seconds. The operator should hear the fuel pump operating.
2. Start the tractor. Repeat step 1 if necessary.

# SERVICE

## Checking the Brake Fluid

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.
4. Press the button on the electrical system circuit breaker to disconnect battery power.
5. Remove the brake master cylinder access panel by removing the four 1/4" bolts.
6. To access the reservoir move the metal retaining bar (A) to the right as shown below.



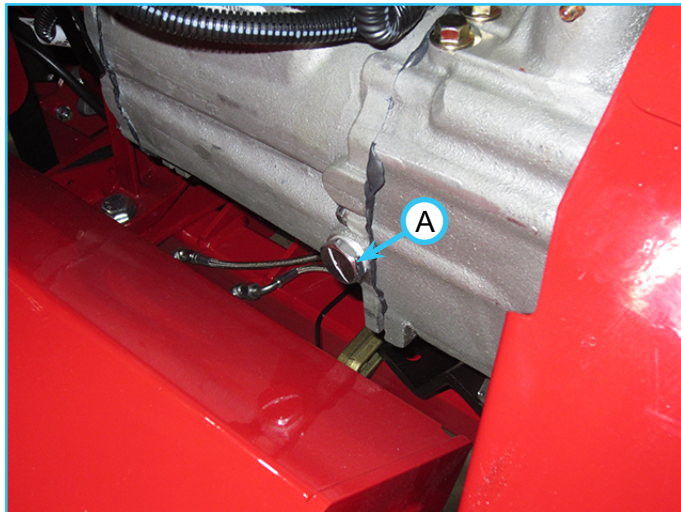
7. Lift the reservoir cap from the reservoir.
8. The fluid level should 1/4" to 1/2" from the top of the reservoir.



9. Add brake fluid as required. The brake fluid type can be found in the specifications section of this manual.
10. Fold the cap diaphragm into itself and reinstall the cap securing it in place with the metal retaining bar.
11. Repeat the process for the other reservoir.

## Checking the Transmission Fluid

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.
4. Press the button on the electrical system circuit breaker to disconnect battery power.
5. Tilt the operators seat forward.
6. Locate the transmission fill plug (A) located on the front side of the transmission.



7. Remove the fill plug and crush washer.
8. The transmission fluid should reach the bottom of the service port hole.
9. Add transmission fluid as required. Transmission fluid type can be found in the specifications section of this manual.

### **CAUTION**

Do not over tighten the fill plug. Over tightening the fill plug could damage the transmission.

10. Install the fill plug and aluminum crush washer.



# SERVICE

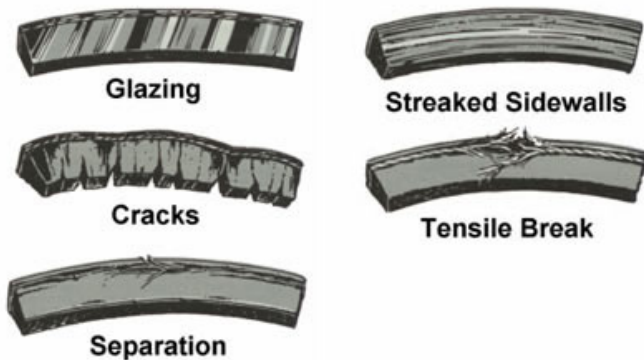
## Checking The Fan (Alternator) Belt

### **⚠ WARNING**

#### **Avoid Personal Injury!**

Fingers or loose clothing can get caught in rotating parts. Shut off the power unit engine, remove the ignition key, and wait for all moving parts to stop rotating before working on the tractor.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Press the button on the electrical system circuit breaker to disconnect the battery power.
5. Open the engine access door.
6. Check the fan belt for excessive wear, cracks, or damage. Replace if necessary.



7. Check the fan belt for proper tension. Depress the belt halfway between the drive pulley and the alternator pulley and measure the belt deflection at specified force 22 lbf (98N, 10 Kgf). The belt deflection should measure 1/4 to 3/8 inches (7 to 9 mm). If the belt deflection is not within specifications, the belt tension must be adjusted.

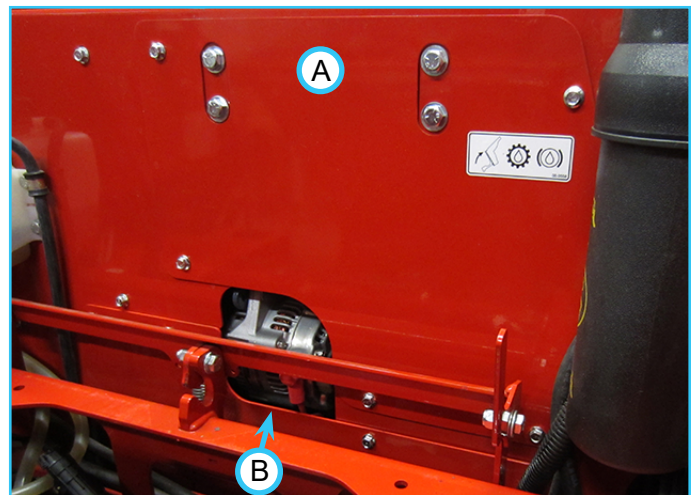
## Adjusting The Fan (Alternator) Belt

### **⚠ WARNING**

#### **Avoid Personal Injury!**

Fingers or loose clothing can get caught in rotating parts. Shut off the power unit engine, remove the ignition key, and wait for all moving parts to stop rotating before working on the tractor.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
1. Remove the key from the ignition switch and allow the engine to cool.
2. Press the button on the electrical system circuit breaker to disconnect the battery power.
3. Remove the upper engine access cover (A) located behind the operators seat.

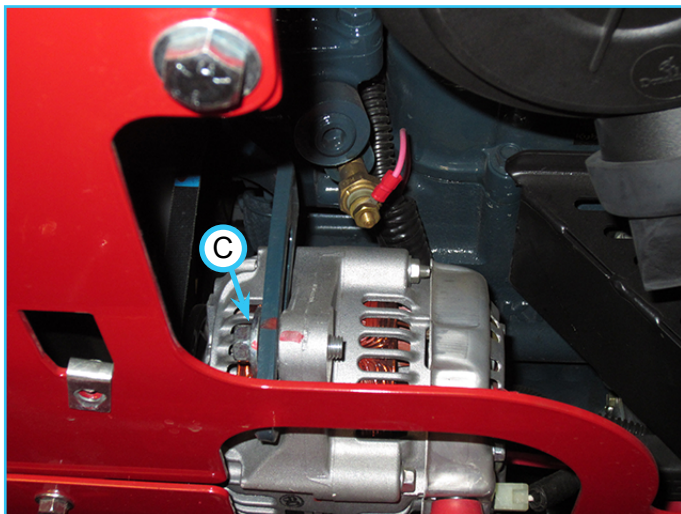


4. Remove the lower engine access cover (B) located behind the operators seat.

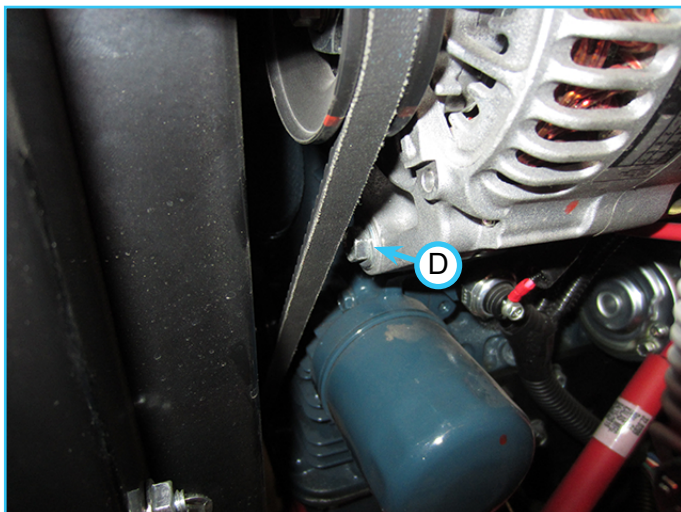


# SERVICE

5. Loosen the alternator adjustment bolt (C).



6. Loosen the bottom alternator mounting bolt (D).



7. Move the alternator in the desired direction.
8. Tighten the alternator adjustment bolt.
9. Tighten the bottom alternator mounting bolt.
10. Check the fan belt for proper tension. Depress the belt halfway between the drive pulley and the alternator pulley and measure the belt deflection at specified force 22 lbs (98N, 10 Kgf). The belt deflection should measure 1/4" to 3/8" (7 to 9 mm). If the belt deflection is not within specifications, the belt tension must be adjusted.
11. Repeat the procedure as required.

## Checking Drive Belts

### ⚠ WARNING

#### Avoid Personal Injury!

Fingers or loose clothing can get caught in rotating parts. Shut off the power unit engine, remove the ignition key, and wait for all moving parts to stop rotating before working on the tractor.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Press the button on the electrical system circuit breaker to disconnect the battery power.
5. Open the engine access door.
6. Check the drive belts for excessive wear, cracks, or damage. Replace if necessary.



Glazing



Streaked Sidewalls



Cracks



Tensile Break



Separation

7. Check the drive belt tension, if the tension is incorrect adjust the drive belt tension. A deflection of 5/16" to 3/8" (8 to 10 mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span. If the belt tension is not within 5/16" to 3/8" (8 to 10mm) adjustment is required.

# SERVICE

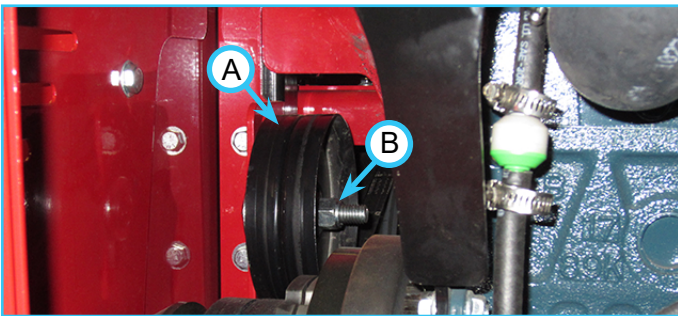
## Adjusting The Drive Belts Tension

### **⚠ WARNING**

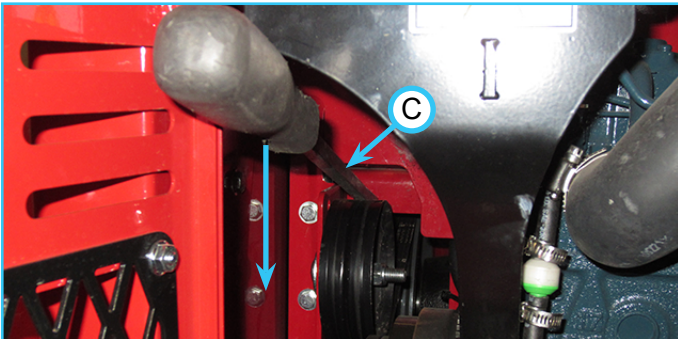
#### **Avoid Personal Injury!**

Fingers or loose clothing can get caught in rotating parts. Shut off the power unit engine, remove the ignition key, and wait for all moving parts to stop rotating before working on the tractor.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
1. Remove the key from the ignition switch and allow the engine to cool.
2. Press the button on the electrical system circuit breaker to disconnect the battery power.
3. Open the engine access door.
4. Locate the drive belt tension pulley (A).



5. Loosen the tension pulley by loosening the 1/2" locknut (B).
6. Use a long pry bar (C) to put downward pressure on the tension pulley.



7. When the pulley is at the desired tension tighten the 1/2" lock nut.
8. Check the drive belt tension, if the tension is incorrect adjust the drive belt tension. A deflection of 5/16" to 3/8" (8 to 10 mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span. If the belt tension is not within 5/16" to 3/8" ( 8 to 10mm) adjustment is required.

## Checking The Hydraulic Pump Belt

### **⚠ WARNING**

#### **Avoid Personal Injury!**

Fingers or loose clothing can get caught in rotating parts. Shut off the power unit engine, remove the ignition key, and wait for all moving parts to stop rotating before working on the tractor.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Press the button on the electrical system circuit breaker to disconnect the battery power.
5. Remove the transmission and belt cover located to the left of the operators seat.
6. Check the hydraulic pump belt for excessive wear, cracks, or damage. Replace if necessary.



Glazing



Streaked Sidewalls



Cracks



Tensile Break



Separation

7. Check the drive belt tension, if the tension is incorrect adjust the drive belt tension. A deflection of 1/8" to 3/16" (3 to 5 mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span. If the belt tension is not within 1/8" to 3/16" ( 3 to 5 mm) adjustment is required.
8. Re-install the transmission and belt cover before operating the tractor.



# SERVICE

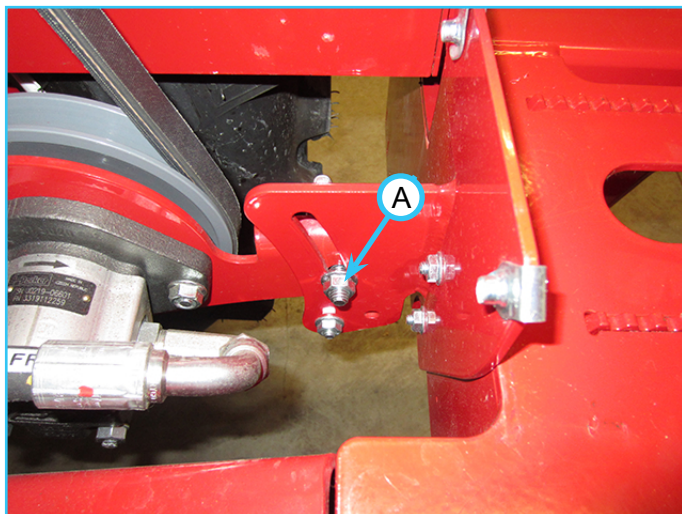
## Adjusting Hydraulic Pump Belt Tension

### **WARNING**

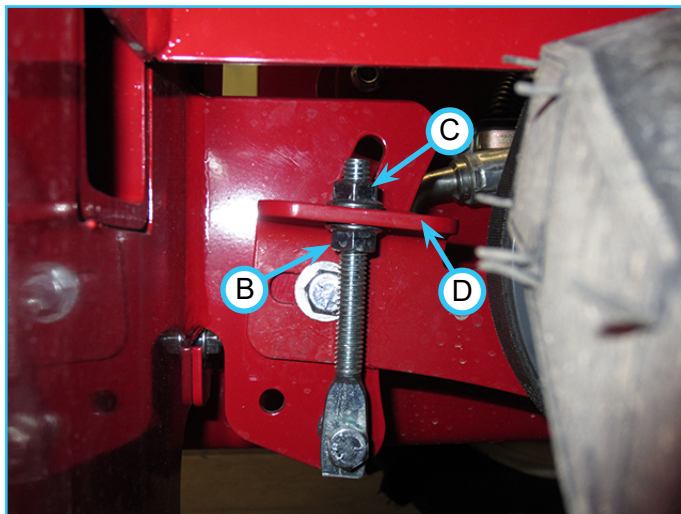
#### **Avoid Personal Injury!**

Fingers or loose clothing can get caught in rotating parts. Shut off the power unit engine, remove the ignition key, and wait for all moving parts to stop rotating before working on the tractor.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch and allow the engine to cool.
4. Press the button on the electrical system circuit breaker to disconnect the battery power.
5. Remove the transmission and belt cover located to the left of the operators seat.
6. To increase the belt tension, loosen the 3/8" flange nut (A).



7. Loosen the 3/8" flange nut (B).



8. Tighten the 3/8" flange nut (C) until the belt reaches the desired tension.
9. Tighten the 3/8" flange bolt (B) against the bracket (D).
10. Tighten the 3/8" flange nut (A) to hold the bracket securely in place.
11. Check the drive belt tension, if the tension is incorrect adjust the drive belt tension. A deflection of 1/8" to 3/16" (3 to 5 mm) under a load of 13.6 lbs (6.2 kgf) pressed in the middle of the span. If the belt tension is not within 1/8" to 3/16" (3 to 5 mm) adjustment is required.
12. Reinstall the transmission and belt cover before operating the tractor.

## **Cleaning Engine Compartment & Engine**

Clean the engine compartment and engine daily or prior to each use, to reduce the risk of engine overheating or ignition of accumulated debris.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition and allow the engine to cool.
4. Open the engine access panel, as well as the radiator access panel.
5. Remove accumulated debris and dust from the engine compartment and engine.
6. Refer also to Cleaning The Radiator And Screen section of this manual.

# SERVICE

## Cleaning The Battery and Terminals

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.
4. Tilt the seat forward and fasten in place with the seat prop.
5. Disconnect and remove the battery
6. Wash the battery with a solution of four tablespoons of baking soda to 1 gallon (3.8 L) of water. Be careful to not get the soda solution into the cell.
7. Rinse the battery with clean water and dry.
8. Clean the battery posts and battery cable terminals with a wire brush.
9. Install the battery back into the tractor.
10. Apply dielectric grease to the battery terminals to prevent corrosion.
11. Place the covers back over the battery terminals.

## Charging The Battery

### DANGER

Batteries produce explosive gases. Charge the battery in a well ventilated space where the gases produced by charging can dissipate. Do not charge where the battery could be exposed to sparks, open flames, or other sources of ignition.

Never charge a frozen battery, as it may explode. Allow the battery to warm up and inspect for cracks or damage before charging.

To preserve optimum battery performance and life, do not allow the battery to stand in a discharged state for long periods of time. If the battery is not being used, check the battery voltage every 30 days and recharge the battery if the voltage drops to 12.4 volts or lower.

Keep the battery fully charged in cold weather to prevent damage due to freezing.

1. If possible, remove the battery from the tractor before charging.
2. Refer to the battery charger's manual for specific charging instructions.
3. If electrolyte is expelled or excessive gassing occurs, or if the temperature of the battery exceeds 125° F (52° C), charging must be temporarily stopped to allow the battery to cool. After cooling, reduce the charging rate before starting the charger again.

## Jump Starting Procedure

### DANGER

The battery produces a flammable and explosive gas. The battery may explode.

- Wear eye protection and gloves.
- Do not jump start a cold or frozen battery. Allow the battery to warm up and inspect for cracks or damage.
- Do not jump start a cracked or damaged battery.
- Do not attempt the jump start a tractor using a battery of a different voltage.

1. Inspect the discharged battery for terminal corrosion and loose connections. Clean the terminals and tighten the connections prior to jump starting.
2. Make sure the vehicle used to jump start the tractor has a 12 volt, negative ground, electrical system.
3. Pull the boosting vehicle up close to the disabled tractor. Be sure the vehicles do not touch.
4. Shut off the boosting vehicle's engine and set the parking brake.

### CAUTION

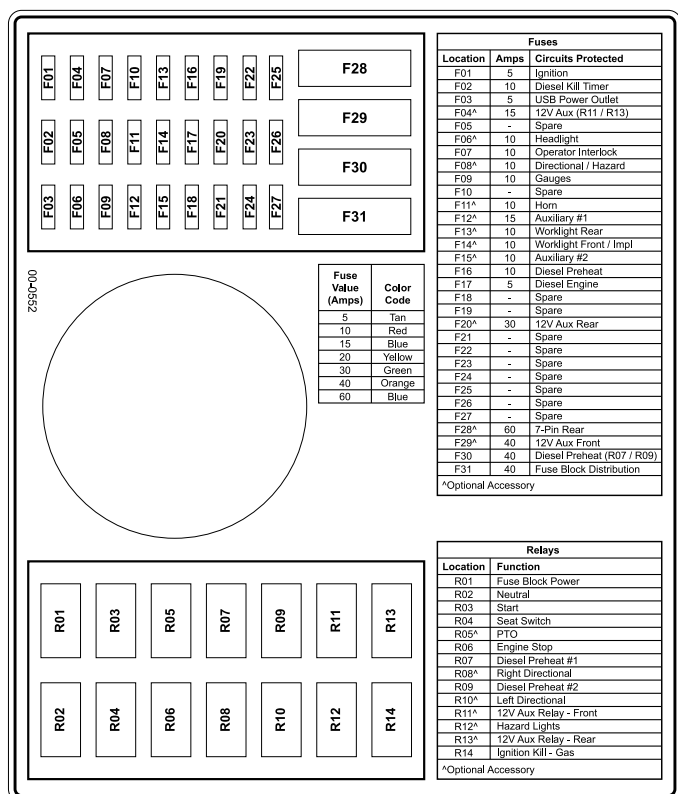
Attempting to start the disabled unit with the boosting vehicle's engine running could cause damage to the regulator.

5. Connect one end of the positive (+) booster cable to the discharged battery's positive (+) terminal.
6. Connect the other end of the positive (+) booster cable to the booster battery's positive (+) terminal.
7. Connect the negative (-) booster cable to the booster battery's negative (-) terminal.
8. Connect the other end of the negative (-) booster cable to the disabled power unit's ground stud.
9. Start the disabled power unit and remove the booster cables in reverse order of installation (negative booster cable first).

# SERVICE

## Replacing Fuses

1. Park the tractor on a level surface.
2. Engage the parking brake and turn off the engine.
3. Remove the key from the ignition switch.
4. Press the electrical system circuit breaker button to disconnect the battery power.
5. Open the fuse panel access door located on the rear of the tractor above the right fender assembly.
6. Remove the upper and lower fuse block covers as required.
7. Identify and pull the defective fuse from the socket.



8. Insert a new fuse into the socket. Be certain to use the correct amperage fuse or damage may occur to the tractor.
9. Reinstall the upper and lower fuse block covers.
10. Reset the electrical system circuit breaker.

## Replacing Light Bulbs

The work lights, taillights, turn signals, and cultivation lights are equipped with LEDs and do not use a replaceable bulb. If a light is no longer functioning the entire light must be replaced. Replacement lights can be purchased at [www.Tilmor.com](http://www.Tilmor.com)

## BPTO Belt Inspection

### ⚠ WARNING

Always set the parking brake, shut off power unit engine, remove the ignition key, and ensure all moving parts have come to a complete stop before inspecting components or attempting any repair or adjustment.

Inspecting the BPTO of the tractor (if equipped) can prevent sudden belt failure by finding problems before they cause the belt to break. Inspect the BPTO belt prior to operation, as part of the daily inspection or anytime a problem is suspected. There may be a BPTO belt problem if there is a squealing or chattering sound, or the smell of a slipping belt.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.
4. Check the BPTO belt for excessive wear, cracks, or damage. Replace if necessary.



Glazing



Streaked Sidewalls



Cracks



Tensile Break



Separation

## Clutch Pedal Adjustment

### ⚠ WARNING

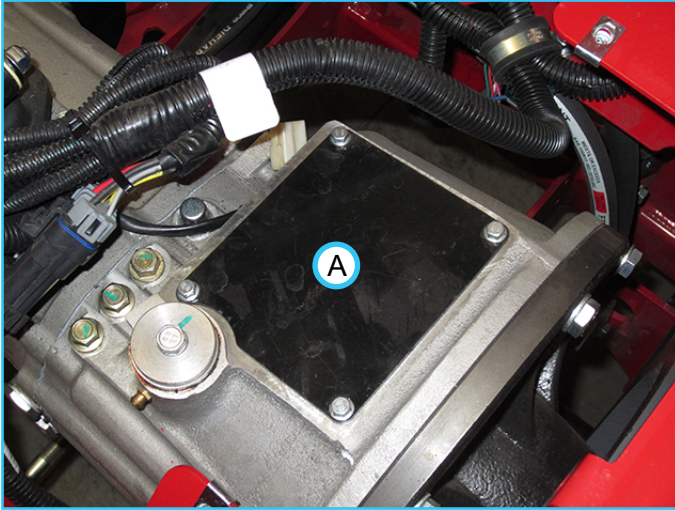
Always set the parking brake, shut off power unit engine, remove the ignition key, and ensure all moving parts have come to a complete stop before inspecting components or attempting any repair or adjustment.

1. Park the tractor on a level surface.
2. Engage the parking brake and shut off the engine.
3. Remove the key from the ignition switch.

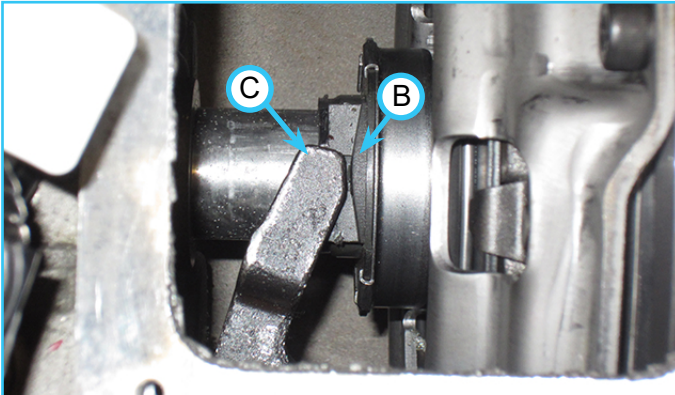


# SERVICE

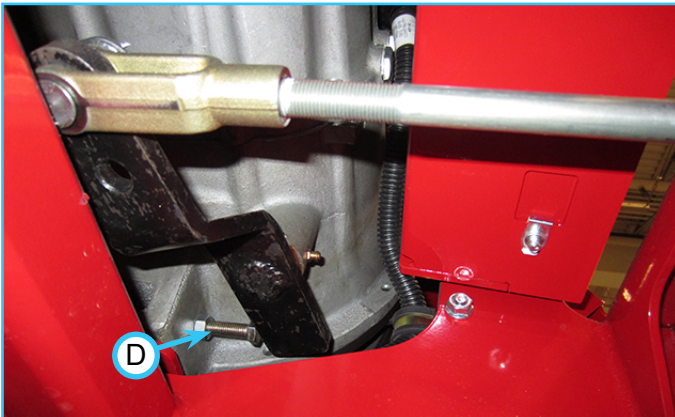
4. Lean the operators seat forward.
5. Remove the inspection cover (A) from the transmission.



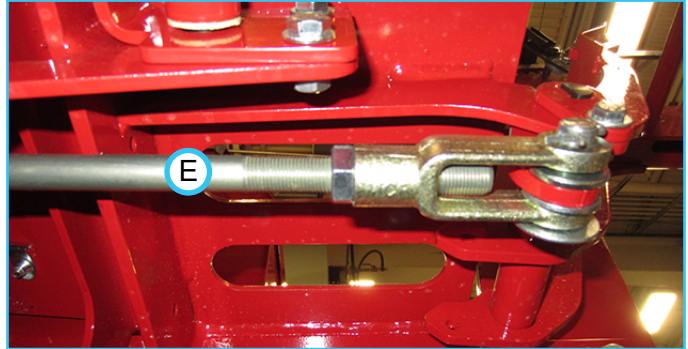
6. With the clutch pedal not engaged verify the distance between the throw out bearing (B) and clutch fork (C) is no greater than 1/8" and no less than 1/16".



7. To adjust the distance, locate the clutch arm stop bolt (D).

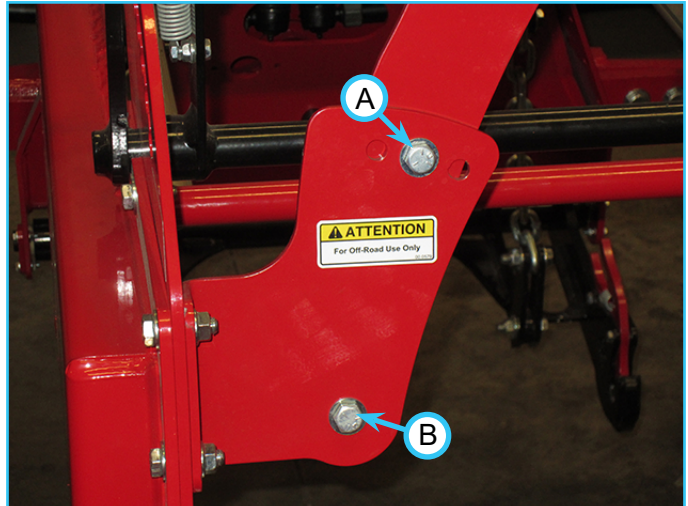


8. Adjust the stop bolt in or out until the desired distance is achieved.
9. Adjust the clutch pedal adjustment rod (E) so that the clutch pedal is 1/4" lower than the brake pedals to prevent over engagement of the clutch.



## Steering Wheel Adjustment

1. Park the tractor on a level surface.
2. Engage the parking brake and turn off the engine.
3. Remove the key from the ignition switch.
4. Loosen the lower steering pivot mounting bolt (B).



5. Remove the upper steering pivot mounting bolt (A).
6. Move the steering pivot to the right or left aligning the pivot with the desired mounting hole.
7. Install the upper pivot bolt through the pivot and steering wheel mount.
8. Torque the upper and lower steering pivot mount bolts to 31 ft-lbs (42 Nm).

# SERVICE

## Tire Pressure

Check the tire pressure prior to operation, as part of the daily inspection. Keep tire inflation within the proper range to prevent premature wear and/or poor traction.

Tire Location	Pressure
Front	30 psi (207 kPa)
Rear	34 psi (234 kPa)

## ROPS And Seat Belt Inspection

### WARNING

Failure to inspect and maintain the Roll-Over Protection System and seat belt can lead to serious injury or death.

If any part of the ROPS experiences structural damage, the entire ROPS must be replaced

Inspect the roll bar and seat belt prior to operation, as part of the daily inspection.

1. Inspect the roll bar for damage, missing components, and loose or missing hardware. Replace any damaged or missing components and tighten loose hardware prior to operating the tractor.
2. Inspect the seat belt webbing for cuts, abrasions, fraying, or excessive wear.
3. Inspect the seat belt webbing for damage from exposure to the sun's ultraviolet rays. If the original color of the webbing is extremely faded, the physical strength of the webbing may be deteriorated.
4. Inspect the seat belt webbing for dust and dirt. If the webbing is packed with dirt, the physical strength of the webbing may be deteriorated.
5. Inspect the seat belt webbing for stiffness. If the webbing is no longer flexible, the physical strength of the webbing may be deteriorated.
6. Inspect the seat belt buckle and latch for damage, cracks, or excessive wear.
7. Inspect the seat belt for proper operation. The seat belt should latch securely and release smoothly. Seat belt adjustment should be accomplished without excessive resistance.

If any problems are detected during this inspection, the component must be replaced prior to operating the tractor.

## Parking Brake Inspection & Adjustment

1. Park the tractor on a level surface.
2. Shut off the engine and remove the key from the ignition switch.

### WARNING

The parking brake must be disengaged as part of the adjustment procedure. Park the tractor on a level surface and place wheel chocks in front and back of the wheels to prevent the tractor from rolling forward or backward.

3. Place wheel chocks in front and back of the rear wheels to prevent the tractor from rolling.
4. With the parking brake handle in the disengaged position, turn the end of the handle to clockwise to tighten the parking brake tension. Turn the end of the handle counter clockwise to loosen the parking brake tension.
5. The minimum engagement force required to set the parking brake effectively is 85 lbf (378 N).

## Storage

### Preparing the Power Unit for Storage

1. Clean the power unit.
2. Inspect for loose or missing hardware, damaged components, or signs of wear.
3. Inspect the ROPS structure and seat belt for damage or signs of wear.
4. Inspect safety decals. Replace any safety decals that are faded, illegible, or missing.
5. Inspect hydraulic hoses for leaks and/or wear. Service as required.
6. Inspect hydraulic hoses, hydraulic fittings, and fuel lines to ensure tight leak free connections.
7. Ensure parking brake tension is properly adjusted.
8. Inspect the electrical system and connections.
9. Test the operator safety interlock system.
10. Inspect the BPTO pulley and belt (if equipped) for damage or excessive wear. Service as required.
11. Check the hydraulic oil level.
12. Check the coolant level. Add fluid or service as required.
13. Ensure the radiator screen, air cleaner, and engine compartment are clean.
14. Check tires for proper inflation.

# SERVICE

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15. Grease and lubricate all points specified in the maintenance section. Wipe off any excess grease or oil.

After the above steps have been performed, complete the preparation for storage by performing the steps for either long term storage (4 months or longer) or short term storage (less than 4 months).

## **Long Term Storage (4 Months or Longer)**

1. Change the engine oil to prevent damage that can be caused by acidic build up in used motor oil.
2. Add a quality diesel fuel treatment to the fuel tank. Follow the manufacturer's recommended mixing ratios.
3. Start the power unit's engine and run for 10 minutes to allow the fuel treatment to travel through the fuel system.
4. Turn the key to the Off position and remove.
5. Engage the parking brake.
6. Turn the fuel shut-off valve to the Off position.
7. Press the button on the electrical system circuit breaker to disconnect the battery power.
8. If the tractor is being stored in a cold climate (below 35° F (2° C)), remove the battery from the tractor and store in a warm location. Check the battery charge level periodically and charge the battery, if necessary.

## **Short Term Storage (Less than 4 Months)**

1. Add a quality diesel fuel treatment to the fuel tank. Follow the manufacturer's recommended mixing ratios.
2. Start the power unit's engine and run for 10 minutes to allow the fuel stabilizer to travel through the fuel system.
3. Turn off the power unit engine and remove the key.
4. Engage the parking brake.
5. Turn the fuel shut-off valve to the Off position.
6. Press the button on the electrical system circuit breaker to disconnect the battery power.
7. Check the battery charge level periodically and charge the battery, if necessary.

## **Removing the Power Unit from Storage**

1. Clean the power unit to remove any accumulated dust or debris.
2. Inspect the power unit as instructed in the daily inspection section of this manual.
3. Test the power unit to ensure all components and systems are working properly.

# SERVICE

## Maintenance Schedule

Tilmor 520Y - Kubota D902 - E4

Maintenance Schedule	# of Locations	# of Pumps	AS NEEDED	After First 50 Hrs	Daily	At 50 Hours	At 100 Hours	At 150 Hours	At 200 Hours	At 250 Hours	At 300 Hours	At 350 Hours	At 400 Hours	At 450 Hours	At 500 Hours	At 550 Hours	At 600 Hours	At 650 Hours	At 700 Hours	At 750 Hours	At 800 Hours	At 850 Hours	At 900 Hours	At 950 Hours	At 1000 Hours	Yearly	1500 Hours*	
Grease & Lubrication: See Lubrication Section																												
Outer Tie Rod Ends	2	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Inner Tie Rod Ends	2	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Front Axle Pivot Tubes	1	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Front Wheel Hubs	2	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Front Hitch Cylinder	2	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Rear Hitch Cylinder	2	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Transmission	2	1	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Seat Slide	2	#	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Engine <sup>†</sup>																												
Check Engine Oil Level				✓																								
Change Engine Oil & Filter <sup>†</sup>		✓				✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		
Clean/Replace Spark Plugs (Gasoline Engines)	Consult Engine Owner's Manual; Follow Service Intervals for Heavy Loads and High Temperatures*																											
Inspect Primary Air Filter				✓																								
Replace Primary Air Filter	**					**		✓		**		✓		**		✓		**		✓		**		✓		**		
Replace Safety Air Filter											✓									✓								
Check Coolant Level				✓																								
Service Cooling System																										✓		
Clean Engine Compartment, Engine, & Radiator	**		✓																									
Replace Fuel Filter (s)	✓										✓									✓								
Drain Water & Sediment from Fuel Tank	✓																									✓		
Hydraulic System																												
Check Hydraulic Oil Level				✓																								
Change Hydraulic Filters <sup>%</sup>						✓			✓					✓					✓						✓			✓
Change Hydraulic Oil														✓					✓						✓			✓
Brakes																												
Brake System Inspection						✓			✓				✓					✓				✓				✓		
Fluid Replacement	**																											
Brake Pad Replacement	**																											
Brake Rotor Replacement	**																											
Parking Brake																												
Parking Brake Inspection & Adjustment				✓																								
Electrical																												
Clean Battery Terminals & Compartment	✓																									✓		
Inspection																												
Inspect Operator Interlock System				✓																								
Inspect ROPS structure and seatbelt				✓																								
Inspect for Loose, Missing, or Worn Components				✓																								
Inspect Battery, Electrical Connections, and Lights				✓																								
Inspect Belts, Fuel Lines, and Hydraulic Lines				✓																								
Check Tire Pressure.				✓																								
Check Front Wheel Lug Nuts. Torque to 95 ft-lbs (128 Nm)					✓	✓				✓				✓				✓				✓						
Check Rear Wheel Stud Bolts. Torque to 130 ft-lbs (176 Nm)					✓	✓				✓				✓				✓				✓						
* If heavy load, high temperature, or dusty condition service intervals are not specified, Tilmor recommends servicing more frequently at 1/2 the standard service interval.																												
** Operation in severe conditions may require more frequent service intervals.																												
<sup>†</sup> Consult Engine Owner's Manual for engine oil information and complete servicing information																												
@ Optional Equipment																												
^ Grease Until Fresh Grease is visible																												
# Silicon Based Spray Lubricant																												
% Hydraulic filters initial change @ 100 hours. Change oil and filters @ 250 hours, then every 250 hours.																												



# SERVICE

## Maintenance Checklist

Tilmor 520Y - Kubota D902 - E4

Maintenance Checklist	# of Locations	# of Pumps	AS NEEDED	After First 50 Hrs.	Daily	At 50 Hours	At 100 Hours	At 150 Hours	At 200 Hours	At 250 Hours	At 300 Hours	At 350 Hours	At 400 Hours	At 450 Hours	At 500 Hours	At 550 Hours	At 600 Hours	At 650 Hours	At 700 Hours	At 750 Hours	At 800 Hours	At 850 Hours	At 900 Hours	At 950 Hours	At 1000 Hours	Yearly	1500 Hours*
Grease & Lubrication: See Lubrication Section																											
Outer Tie Rod Ends	2	1																									
Inner Tie Rod Ends	2	1																									
Front Axle Pivot Tubes	1	1																									
Front Wheel Hubs	2	1																									
Front Hitch Cylinder	2	1																									
Rear Hitch Cylinder	2	1																									
Transmission	2	1																									
Seat Slide	2	#																									
Engine†																											
Check Engine Oil Level																											
Change Engine Oil & Filter †																											
Clean/Replace Spark Plugs (Gasoline Engines)	Consult Engine Owner's Manual; Follow Service Intervals for Heavy Loads and High Temperatures*																										
Inspect Primary Air Filter																											
Replace Primary Air Filter																											
Replace Safety Air Filter																											
Check Coolant Level																											
Service Cooling System																											
Clean Engine Compartment, Engine, & Radiator																											
Replace Fuel Filter (s)																											
Drain Water & Sediment from Fuel Tank																											
Hydraulic System																											
Check Hydraulic Oil Level																											
Change Hydraulic Filters%																											
Change Hydraulic Oil																											
Brakes																											
Brake Inspection																											
Fluid Replacement																											
Brake Pad Replacement																											
Brake Rotor Replacement																											
Parking Brake																											
Parking Brake Inspection & Adjustment																											
Electrical																											
Clean Battery Terminals & Compartment																											
Inspection																											
Inspect Operator Interlock System																											
Inspect ROPS structure and seatbelt																											
Inspect for Loose, Missing, or Worn Components																											
Inspect Battery, Electrical Connections, and Lights																											
Inspect Belts, Fuel Lines, and Hydraulic Lines																											
Check Tire Pressure.																											
Check Front Wheel Lug Nuts. Torque to 95 ft-lbs (128 Nm)																											
Check Rear Wheel Stud Bolts. Torque to 130 ft-lbs (176 Nm)																											
* If heavy load, high temperature, or dusty condition service intervals are not specified, Tilmor recommends servicing more frequently at 1/2 the standard service interval.																											
** Operation in severe conditions may require more frequent service intervals.																											
† Consult Engine Owner's Manual for engine oil information and complete servicing information																											
@ Optional Equipment																											
^ Grease Until Fresh Grease is visible																											
# Silicon Based Spray Lubricant																											
% Hydraulic filters initial change @ 100 hours. Change oil and filters @ 500 hours, then every 1000 hours.																											

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## Tilmor Maintenance Log

[illegible]

# TROUBLESHOOTING

## Engine

Symptom:	Possible Cause:
Starter will not engage.	Battery disconnect switch is in the Off position. Blown fuse. Tractor transmission is not in neutral. Low battery voltage. BPTO is engaged (if equipped).
Engine cranks, but will not start.	Fuel shut-off valve is turned off. Insufficient fuel level. Faulty fuel pump. Plugged fuel filter. Fuel tank vent not operating. Cold weather - cycle the glow plugs a second time. Glow plugs not working. Obstruction in the fuel line. Faulty injector pump. Poor engine compression.
Engine runs rough.	Plugged or partially plugged air filters. Plugged or partially plugged fuel filters. Fuel tank vent not operating properly. Stale, dirty fuel or wrong seasonal fuel mixture. Insufficient fuel level. Faulty fuel pump. Dirty or faulty fuel injectors. Faulty injector pump. Incorrect valve clearance. Valve seat failure.
Engine low on power.	Plugged or partially plugged air filters. Plugged or partially plugged fuel filters. Dirty or faulty fuel injectors. Low cylinder compression. Faulty injector pump.
Engine overheats.	Dirty radiator screen. Low coolant level. Debris in the engine compartment. Defective radiator cap. Defective thermostat. Loose alternator fan belt. Blown head gasket.



# TROUBLESHOOTING

## Engine (Continued)

Symptom:	Possible Cause:
Oil light comes on when running.	Low oil level. Faulty oil sender. Faulty or plugged oil pump.
Excessive fuel consumption.	Plugged or restricted air filters or hose. Dirty or faulty fuel injectors.
Excessive oil consumption.	Check for leaks. Incorrect oil viscosity. Plugged or restricted air filters and or hose. Worn rings or cylinder walls. Worn or faulty valves.
Low oil pressure	Engine oil level is low. Improper oil viscosity. Oil filter is plugged.

## Hydraulic

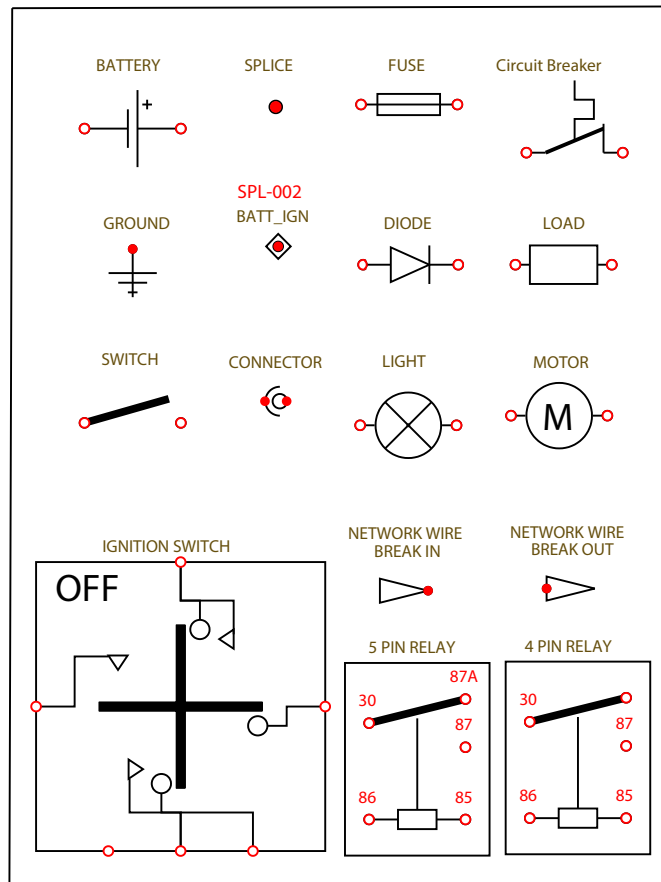
Symptom:	Possible Cause:
Mid mount hitch inoperable.	Hydraulic oil level is low. Excessive load on mid mount hitch. Plugged hydraulic filter. Faulty hydraulic cylinder. Loose or broken hydraulic pump belt.
Rear hitch inoperable.	Hydraulic oil level is low. Excessive load on rear hitch. Plugged hydraulic filter. Faulty hydraulic cylinder. Loose or broken hydraulic pump belt.

# TROUBLESHOOTING

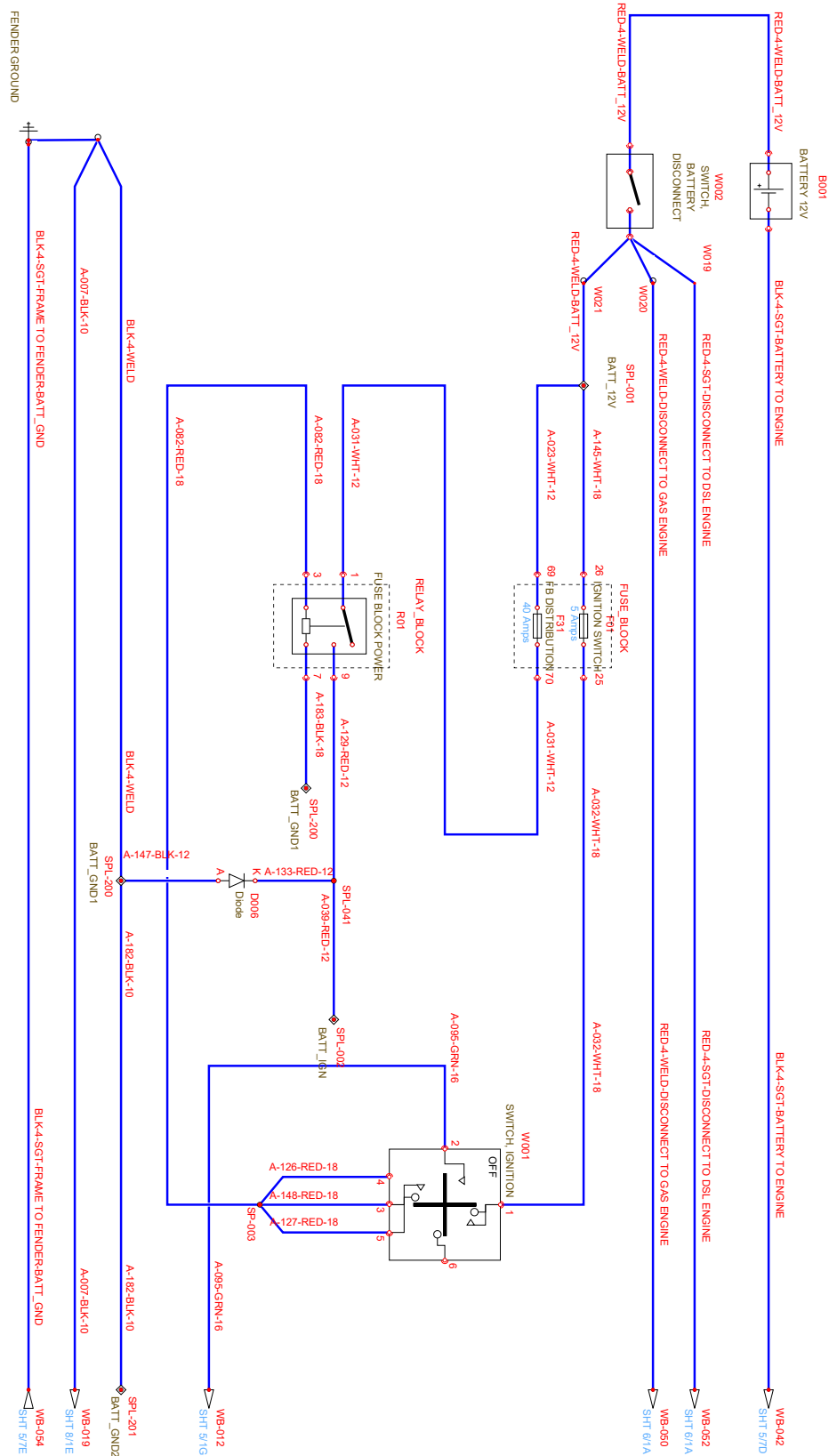
## Electrical

Symptom:	Possible Cause:
Battery does not charge.	Loose or corroded connections. Broken or loose wire in the charging system. Blown fuse in the charging system. Defective battery. Loose alternator belt. Defective alternator.
Lights are inoperable.	Blown fuse. Broken wire. Defective Light Switch.
Starter Inoperative	Slipping alternator fan belt. Operator not present in operators seat. Transmission not in neutral. PTO lever is engaged (if equipped). Low battery output voltage.

## Wiring Diagram Reference Key



## Wiring Circuit - Main Power / Ignition Switch Schematic

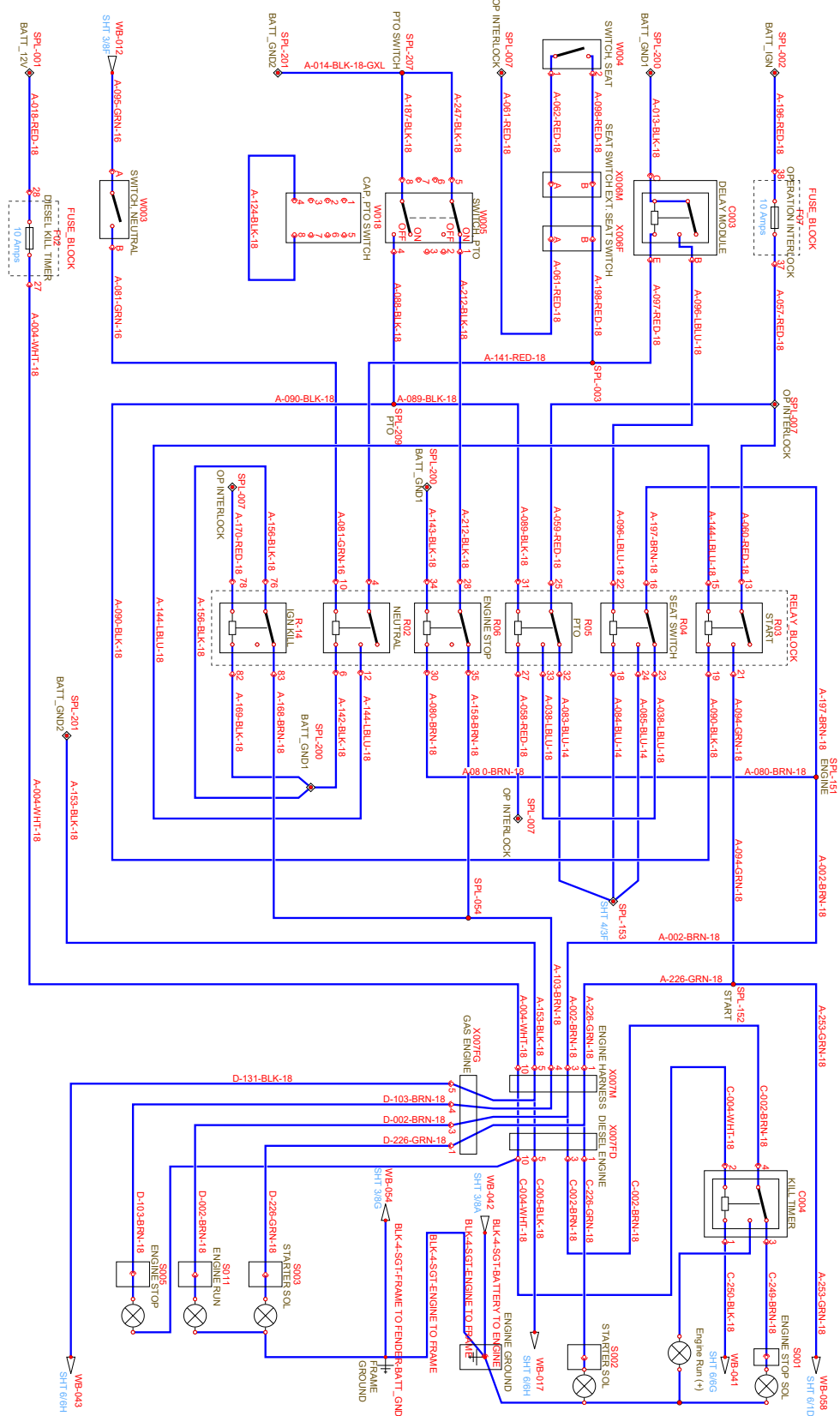


## Wiring Circuit - Gauges / USB / AUX / Misc Fuse Block Schematic





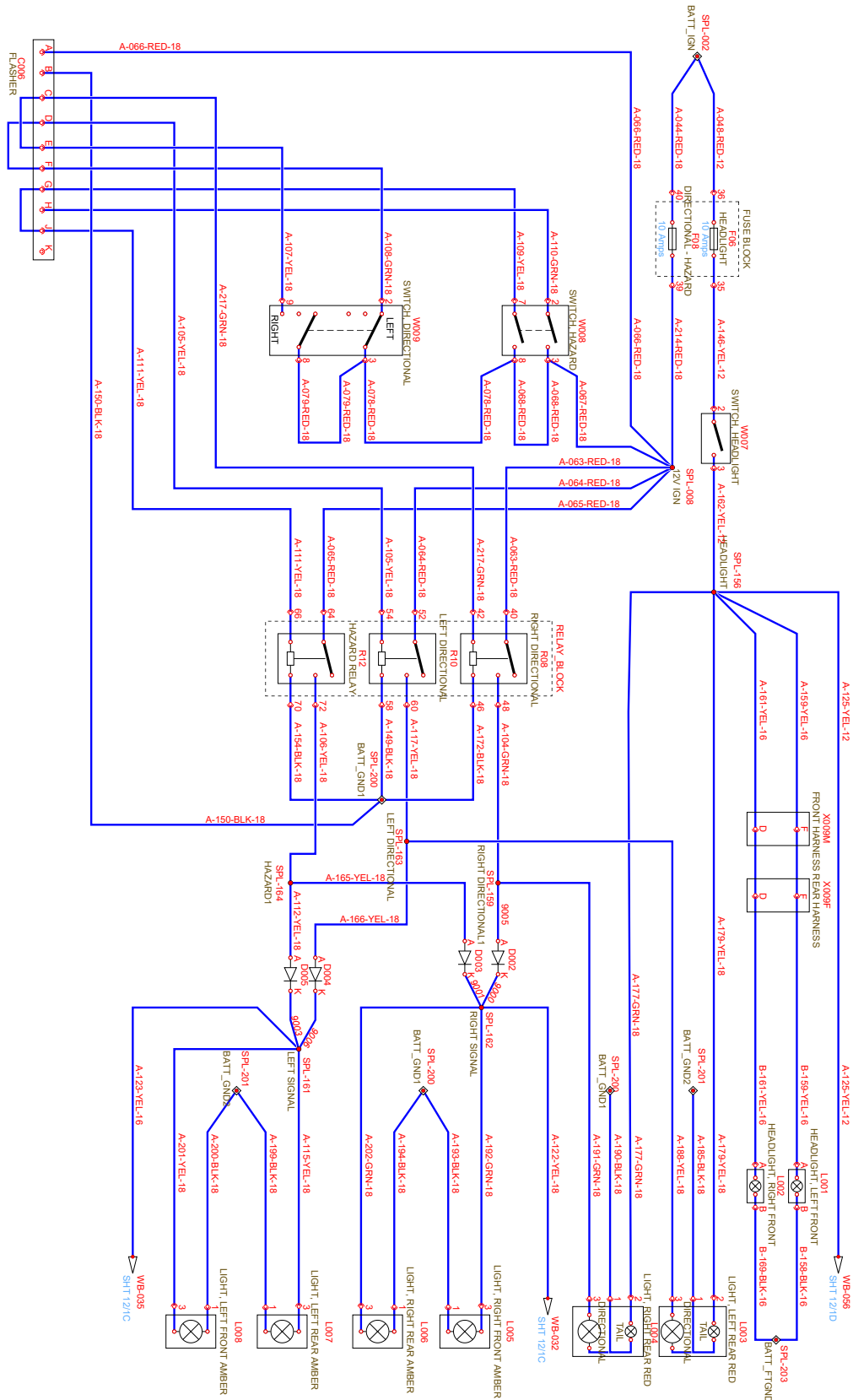
## Wiring Circuit - Operation Interlock Schematic



## Wiring Circuit - Engine Functions / Diesel - Gas Schematic



## Wiring Circuit - Head & Tail Light - Directional / Hazards Schematic



# SPECIFICATIONS

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## Engine

Model . . . . .	520Y
Manufacturer . . . . .	Kubota
Model Number . . . . .	D902
Type . . . . .	Diesel
Cylinders. . . . .	3
Displacement . . . . .	898 cc
Engine Gross HP . . . . .	22
Operating Range (RPM). . . . .	1000 - 1850
Cooling System . . . . .	Liquid Cooled
Alternator . . . . .	60 Amp, 12 V, 720 W

## Electrical

Battery . . . . .	550 Cold Cranking Amps
Voltage. . . . .	12 Volts

## Power Train

Type . . . . .	Rear Wheel Drive
Four Speed Transmission . . . . .	Manual 4 Forward 1 Reverse
Two Speed Transmission . . . . .	Manual High and Low
Fwd Speed (High)* . . . . .	13 Mph (21 Kph)
Fwd Speed (Low)*. . . . .	.5 Mph (.8 Kph)
Brakes . . . . .	2 Four Piston Caliper Hydraulic Disc Brakes

## Controls & Instrument Panel

Steering . . . . .	Manual
BPTO . . . . .	Manual
Throttle Control . . . . .	Cable
Gauges . . . . .	Tachometer, Volt, Water Temperature, Fuel, Speedometer
Parking/Emergency Brake. . . . .	Band Brake

## Other Features

Standard Tires Front. . . . .	Tractor 4.0 - 12
Standard Tires Rear . . . . .	Bar 8.3 - 24, 6 Ply
Attachment System . . . . .	Tilmor

\*May vary based on tire size, type, and inflation



# SPECIFICATIONS

## Dimensions

Wheelbase . . . . .	85.8 in (218 cm)
Overall Length . . . . .	127.8 in (325 cm)
Overall Height (top of ROPS bar) . . . . .	87.2 in (221 cm)
Overall Width (narrow track)* . . . . .	49.9 in (127 cm)
Overall Width (wide track)* . . . . .	77.6 in (197 cm)
Weight** . . . . .	2900 lbs (1315 kg)

Tilmor LLC. Reserves the right to change any specifications without notice.

\* May vary based on tire size, type, and inflation.

\*\* Weight varies based on engine size, tire options, and optional accessories.

## Load Capacities

<b>Maximum Tractor Weight . . . . .</b>	<b>4000 lbs (1814 kg)</b>
Front Axle . . . . .	980 lbs (444 kg)
Rear Axle . . . . .	3200 lbs (1451 kg)
Mid Mount Hitch . . . . .	450 lbs (204 kg)
Rear Mount Hitch . . . . .	500 lbs (226 kg)
Maximum Static Vertical Load On Receiver Hitch . . . . .	500 lbs (226 kg)
Maximum Trailed Mass . . . . .	2000 lbs (907 kg)

## Fluid Capacities & Specifications

	Fluid Type	Capacity	Filter #1	Filter #2
Engine Oil	10W-30*	3.9 qts (3.7 L)	13-0267	-
Hydraulic Oil	Mobifluid 424	6.5 qts (6.2 L)	21-0078	-
Transmission	Mobifluid 424	2.2 qts (2.1 L)	-	-
Final Drive	Mobifluid 424	.7 qts (.66 L) Each Side	-	-
Cooling System	50% Distilled Water and 50% ethylene glycol antifreeze	7 qts. (6.6 L)	-	-
Fuel System	Ultra-Low Sulfur Diesel	7.6 gal (3.7 L)	13-0053	13-0220
Brake Fluid	DOT 3	16oz (29.57ml)	-	-
Grease	Lithium Complex NLGI #2	Refer to Maintenance Chart	-	-

# WARRANTY

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## **Return Policy & Procedure**

All new and unused products may be returned within 30 days of the ship date for a refund. If returning an item, first contact a Tilmor customer support representative at 1-844-255-5864 to obtain a return merchandise authorization (RMA) prior to shipping the item to Tilmor. Shipping costs for returns will be incurred by the customer. Refunds may be subject to a 10% restocking fee.

## **Warranty**

Contact a Tilmor customer support representative at 1-844-255-5864 immediately if a product purchased on [tilmor.com](http://tilmor.com) should fail during the defined warranty period. Items purchased on [tilmor.com](http://tilmor.com) may be manufactured by Tilmor LLC or one of our trusted partners. For all products not branded by Tilmor, the original equipment manufacturer's warranty statement will define period, policy and procedure.

Tilmor Warranty Period

### **Non-serialized Product - 1 Year**

Unless otherwise stated, all non-serialized Tilmor products are protected against defects in materials and workmanship, under ordinary and normal use, for a period of one year from the shipping date. Warranties on non-serialized Tilmor products are not transferable.

### **Serialized Product - 2 Year or 1000 hours**

Unless otherwise stated, all serialized Tilmor products are protected against defects in materials and workmanship, under ordinary and normal use, for a period of two years from the shipping date or 1000 hours on tractor hour meter (whichever comes first). Warranties on serialized Tilmor products are transferable.

## **Tilmor Warranty Policy**

Tilmor LLC may opt to repair, replace, or issue a refund for Tilmor products that are defective or have sustained damage in shipping. The following actions and damages are excluded from warranty:

- deterioration due to normal wear and tear,
- damage caused by an act of nature (fire, flood, wind, etc.),
- damage caused by accident, improper usage or negligence.

Tilmor LLC reserves the right to approve warranty repair time, decide whether to send new parts and/or request old parts for review. Our intention is to be fair to all parties (i.e. customer, repair shop and Tilmor).

## **Tilmor Warranty Procedure**

Contact a Tilmor representative immediately if a Tilmor product should fail during the defined warranty period. The representative will initiate a claim and determine the quickest method to resolve the issue. Tilmor does not have local dealerships and will work directly with the customer to resolve the problem. If the customer prefers, we will work with a technician of the customer's choice to perform the repair.