

FOREWORD

Congratulations, and welcome to the fabulous world of **CS2220H(S)/CS2520H(S)** ownership, where serious work is made fun again!

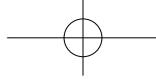
This versatile tractor is a culmination of the entire tractor and diesel knowledge gained by the Daedong Industrial Co.,LTD, since 1947 and has been designed with the finest materials, and quality control standard.

Knowledge of tractor operation is essential for many years of dependable service and reliability. To help new owners familiarize themselves with the **CS2220H(S)/CS2520H(S)**, it is the policy of **KIOTI** tractor to provide an owner's manual which includes helpful information about tractor safety, operation and maintenance. If the information you seek is not found in this manual, your **KIOTI** tractor dealer will be happy to help you.

Please feel free to contact **DAEDONG IND. CO.,LTD / DAEDONG-USA, INC.** with your questions/concerns.

< NOTE >

- Make sure to read this manual carefully and keep it reading accessible future reference.
- When leasing or transferring this tractor, deliver this manual together with the tractor.
- The specifications in this manual are subject to change without notice.



ISO 3600 EU STANDARDS

This manual was compiled in compliance with the ISO 3600 standards and the instructions contained here comply with the requirements of the Machinery Directive 2010/52/EU in force in the European Community. For tractors sold or used outside the European Community, local laws will prevail.

Main protections on the tractors discussed in this manual.

DESCRIPTION	NON CABIN	REMARK
1. ROPS (protection against overturning)	Yes	
2. FOPS (protection against objects falling from above)	No	
3. OPS (protection against penetration of objects from sides) protection against hazardous chemicals	No (Category I)	



TABLE OF CONTENTS

SECTION

■ <i>SAFETY PRECAUTIONS.....</i>	<i>1</i>
■ <i>PRECAUTIONS BEFORE OPERATION.....</i>	<i>2</i>
■ <i>SPECIFICATIONS.....</i>	<i>3</i>
■ <i>DESCRIPTION OF OPERATING SYSTEM.....</i>	<i>4</i>
■ <i>OPERATION.....</i>	<i>5</i>
■ <i>3- POINT HITCH IMPLEMENT OPERATION..</i>	<i>6</i>
■ <i>MAINTENANCE.....</i>	<i>7</i>
■ <i>STORAGE AND DISPOSAL.....</i>	<i>8</i>
■ <i>TROUBLESHOOTING.....</i>	<i>9</i>
■ <i>INDEX.....</i>	<i>10</i>

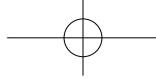


TABLE OF CONTENTS

SAFETY PRECAUTIONS	1-1	VEHICLE IDENTIFICATION NUMBER.....	2-2
PRECAUTIONS BEFORE OPERATION	1-2	PRODUCTION NUMBER	2-2
GENERAL PRECAUTIONS.....	1-2	ENGINE NUMBER	2-2
PRECAUTIONS DURING OPERATION	1-8	TRANSMISSION NUMBER.....	2-2
WHEN STARTING THE ENGINE	1-8	ESSENTIAL REPLACEMENT PARTS	2-4
WHEN DRIVING THE TRACTOR	1-12	OILS AND FLUIDS	2-4
WHEN PARKING THE TRACTOR	1-13	FILTERS	2-4
WHEN OPERATING THE P.T.O	1-14	BELTS AND RUBBER PARTS.....	2-5
WHEN USING THE 3-POINT HITCH	1-15	OTHER COMPONENTS	2-5
SAFETY PRECAUTIONS DURING SERVICING ...	1-15	SPECIFICATIONS.....	3-1
SAFETY PRECAUTIONS WHEN USING THE		GENERAL SPECIFICATIONS	3-2
LOADER	1-19	EXTERNAL DIMENSIONS	3-2
SAFETY DECAL MAINTENANCE	1-25	MAJOR SPECIFICATIONS	3-3
DECAL MOUNTING LOCATION	1-25	OPTION LIST	3-6
DECALS	1-26	NOISE LEVELS AS PERCEIVED BY THE OPERATOR....	3-7
CAUTIONS FOR DECAL MAINTENANCE	1-29	VIBRATION LEVELS OF THE TRACTOR EXPOSI-	
PRECAUTIONS BEFORE OPERATION	2-1	TION TO VIBRATIONS	3-7
		IMPLEMENT LIMITATIONS	3-9
		STANDARD IMPLEMENT DIMENSIONS	3-9

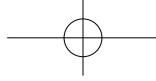


TABLE OF CONTENTS

DESCRIPTION OF OPERATING SYSTEM.....	4-1	BRAKE PEDAL.....	4-16
EXTERIOR VIEW.....	4-3	PARKING BRAKE LEVER.....	4-17
MOUNTING LOCATION.....	4-4	FRONT WHEEL DRIVE LEVER.....	4-17
KEY SWITCH.....	4-4	FORWARD/REVERSE DRIVING PEDALS.....	4-18
COMBINATION SWITCH.....	4-7	HAND THROTTLE LEVER.....	4-18
HAZARD LAMP SWITCH.....	4-8	DIFFERENTIAL LOCK PEDAL.....	4-19
CRUISE OPERATION SWITCH (OPTIONAL).....	4-9	PTO SWITCH (ON / OFF).....	4-20
INSTRUMENT PANEL.....	4-10	PTO SHIFT LEVER.....	4-20
VIEW.....	4-10	CUTTING HEIGHT ADJUSTMENT LEVER.....	4-21
TACHOMETER/HOUR METER INDICATOR.....	4-11	SEAT ADJUSTMENT.....	4-22
FUEL GAUGE.....	4-11	HYDRAULIC SYSTEM.....	4-23
ENGINE COOLANT TEMPERATURE GAUGE.....	4-12	POSITION CONTROL LEVER.....	4-23
ENGINE OIL PRESSURE WARNING LAMP.....	4-12	LIFTING ARM (LOWER LINK) SPEED CONTROL LEVER.....	4-24
BATTERY CHARGING LAMP.....	4-13	DOUBLE ACTING LEVER (OPTIONAL).....	4-24
TURN SIGNAL LAMP.....	4-13	AUXILIARY PORT (OPTIONAL).....	4-25
GLOW PLUG INDICATOR.....	4-14	PTO SHAFT COVER & CAP.....	4-25
CRUISE LAMP (OPTIONAL).....	4-14	ACCESSORY SYSTEM.....	4-26
OPERATING THE CONTROLS.....	4-15	POWER SOCKET & USB CHARGE.....	4-26
HST RANGE GEAR SHIFT LEVER.....	4-16	CUP HOLDER.....	4-26

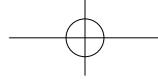


TABLE OF CONTENTS

TOOL BOX.....	4-27	RAISING THE ROPS TO UPRIGHT POSITION	5-14
TIRES, WHEELS AND BALLAST	4-27	PARKING.....	5-15
INFLATION PRESSURE	4-28	TURNING	5-17
TREAD	4-29	DRIVING ON SLOPE	5-17
WHEEL TORQUE AND DIRECTION.....	4-29	CAUTIONS CONCERNING PAVED ROAD	5-18
ADDITIONAL WEIGHT (OPTIONAL)	4-30	PRECAUTIONS WHILE DRIVING ON THE ROAD	5-18
OPERATION	5-1	LOADING INTO AND UNLOADING OUT OF THE TRUCK.....	5-19
PRE-OPERATION.....	5-2	POWER STEERING PRECAUTIONS.....	5-20
INITIAL OPERATION.....	5-3	3-POINT HITCH CONTROL SYSTEM	5-22
OPERATING THE ENGINE	5-3	EXTERIOR HYDRAULIC CONTROL SYSTEM (OPTIONAL).....	5-23
STARTING THE ENGINE.....	5-3	3-POINT HITCH IMPLEMENT AND LOADER OPERATION.....	6-1
ENGINE CHECK LAMPS	5-7	REMOVAL AND INSTALLATION OF 3-POINT HITCH IMPLEMENT (WITH P.T.O SHAFT)	6-2
STOPPING THE ENGINE	5-8	MOWER IMPLEMENT.....	6-2
WARMING UP	5-9	HOW TO USE.....	6-5
JUMP STARTING THE ENGINE	5-10	OPERATION TIP FOR 3-POINT HITCH ELEMENTS	6-6
OPERATING THE TRACTOR.....	5-11	ADJUSTMENT OF LIFT ROD	6-6
DRIVING.....	5-11	ADJUSTMENT OF TOP LINK	6-7
FOLDING THE ROPS	5-13		

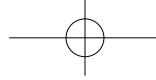


TABLE OF CONTENTS

ADJUSTMENT OF STABILIZER	6-7	CLEANING GRILL, RADIATOR SCREEN (G)	7-13
DRAFT HITCH AND TRAILER	6-8	CHECKING BRAKE AND CLUTCH PEDALS (H)	7-14
INSTALLING PTO SHAFT	6-9	CHECKING GAUGES, METER AND EASY CHECK LAMPS (I).....	7-14
HANDLING LOADER	6-11	CHECKING HEAD LIGHT, HAZARD LIGHT ETC. (J)...	7-14
DRIVING ON SLOPE	6-12	CHECKING SEAT BELT AND ROPS (K).....	7-14
FIXATION POINTS FOR ATTACHMENT	6-14	CHANGING ENGINE OIL AND REPLACING FILTER (L) ...	7-14
JOYSTICK LEVER	6-15	REPLACING TRANSMISSION FLUID AND FILTER (M) ..	7-16
JOYSTICK VALVE PORT	6-18	CHANGING FRONT AXLE CASE OIL (N).....	7-18
MAINTENANCE	7-1	ADJUSTING BRAKE PEDAL (O)	7-19
MAINTENANCE CHECK LIST	7-3	LUBRICATING GREASE FITTINGS (P).....	7-21
DAILY CHECK CHART	7-3	CHECKING WHEEL BOLT/NUT TORQUE (Q)	7-22
MAINTENANCE SCHEDULE CHART	7-4	ADJUSTING CLUTCH PEDAL (R)	7-22
LUBRICANTS	7-8	REPLACING AIR CLEANER PRIMARY ELEMENT (T) ...	7-23
MAINTENANCE CODE	7-9	CHECKING FUEL LINES (U)	7-24
HOW TO DISCONNECT THE HOOD (A).....	7-9	BLEEDING FUEL SYSTEM (AK)	7-25
CHECKING AND ADDING FUEL (C)	7-9	CHECKING INJECTION NOZZLE AND FUEL INJEC- TION PUMP	7-26
CHECKING TRANSMISSION FLUID LEVEL (D).....	7-10	ADJUSTING FAN BELT TENSION (V).....	7-27
CHECKING ENGINE OIL LEVEL (E)	7-11	BATTERY (W).....	7-28
CHECKING COOLANT LEVEL (F).....	7-13	CHECKING INTAKE AIR LINE (X)	7-30
		ADJUSTING TOE-IN (Y)	7-30

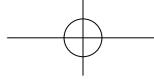
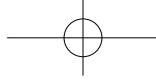


TABLE OF CONTENTS

CHECKING RADIATOR HOSE AND CLAMP (Z).....	7-31	TRACTOR TROUBLESHOOTING	9-4
POWER STEERING LINE (AA).....	7-32	INDEX.....	10-1
ADJUSTING ENGINE VALVE CLEARANCE (AE)	7-32		
REPLACING AIR CLEANER FILTER (AF)	7-32		
FLUSH COOLING SYSTEM AND CHANGING COOL- ANT (AJ).....	7-33		
ANTI-FREEZE	7-35		
REPLACING FUSE (AN).....	7-35		
SLOW BLOW FUSE (AP).....	7-37		
REPLACING BULB (AQ).....	7-38		
STORAGE AND DISPOSAL.....	8-1		
TRACTOR STORAGE	8-2		
DAILY STORAGE	8-2		
LONG-TERM STORAGE.....	8-2		
USING TRACTOR AFTER STORAGE.....	8-3		
USAGE AND DISPOSAL.....	8-4		
TROUBLESHOOTING	9-1		
ENGINE TROUBLESHOOTING	9-2		



SAFETY AND VEHICLE DAMAGE WARNING

This manual includes information titled as **WARNING**, **CAUTION**, **IMPORTANT** and **NOTE**. These titles indicate the following:



This indicates that a condition may result in harm, serious injury or death to you or other persons if the warning is not heeded. Follow the advice provided with the warning.



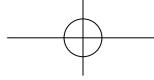
This indicates that a condition may result in damage to your vehicle or its equipment if the caution is not heeded. Follow the advice provided with the caution.



This mark indicates emphasis on notable characteristics of working procedures, and information about technology for easier operation.



This indicates that interesting or helpful information is being provided.



UNIVERSAL SYMBOLS

Various universal symbols have been used on the instruments and controls of your **KIOTI** tractor. Below is a list of the universal symbols and their meanings.

 Fuel-level	 Power Take-off Clutch Control-on Position	 Preheat
 Parking Brake	 Differential Lock	 H: High Speed Travel Light
 Battery Charging Condition	 Hazard Warning Lights	 L: Low Speed Travel Light
 Engine Oil-pressure	 Headlight-high Beam	 Neutral Position
 Turn Signal	 Four-wheel Drive-on	 Engine Check Warning Lamp



SAFETY PRECAUTIONS

1

1

PRECAUTIONS BEFORE OPERATION 1-2

 GENERAL PRECAUTIONS1-2

PRECAUTIONS DURING OPERATION 1-8

 WHEN STARTING THE ENGINE1-8

 WHEN DRIVING THE TRACTOR.....1-12

 WHEN PARKING THE TRACTOR.....1-13

 WHEN OPERATING THE P.T.O.....1-14

 WHEN USING THE 3-POINT HITCH1-15

SAFETY PRECAUTIONS DURING SERVICING 1-15

**SAFETY PRECAUTIONS WHEN USING THE LOAD-
ER..... 1-19**

SAFETY DECAL MAINTENANCE 1-25

 DECAL MOUNTING LOCATION.....1-25

 DECALS.....1-26

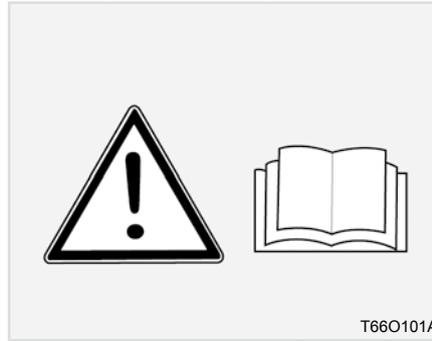
 CAUTIONS FOR DECAL MAINTENANCE1-29



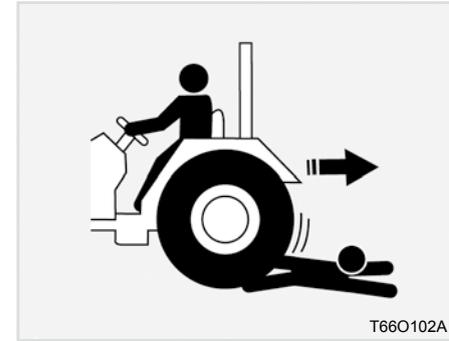
PRECAUTIONS BEFORE OPERATION

GENERAL PRECAUTIONS

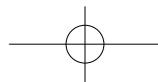
A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, use these safety precautions, and pay attention to the job at hand. If you can prevent an accident, your time will have been well spent.

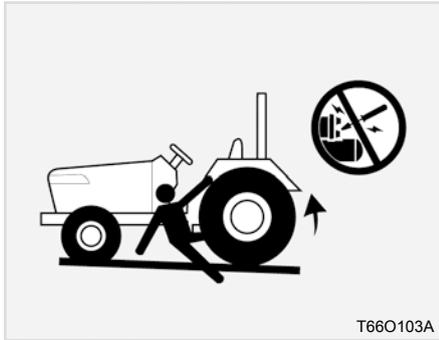


1. It is recommended that you read and understand this entire manual before operation of your new tractor. Failure to do so could result in accidents, injury, or death!
2. Only persons who are properly trained should be allowed to operate the tractor.
3. Read and follow all warning labels and decals affixed to the tractor.
4. Replace any missing or damaged decals as soon as it is practical. A list of decals is shown on page 1-25~29.

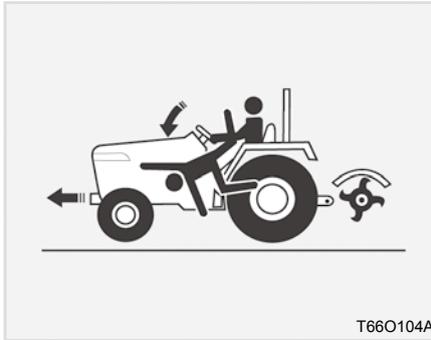


5. Keep safety decals clean of dirt and debris.
6. Watch where you are going at all times so that you are able to avoid obstacles that can cause injury or damage to your tractor.
7. When starting the tractor make sure your path is clear of people to avoid accidents caused by sudden movements.
8. Before making reverse movements with your tractor, you should always check to see that the path is clear.

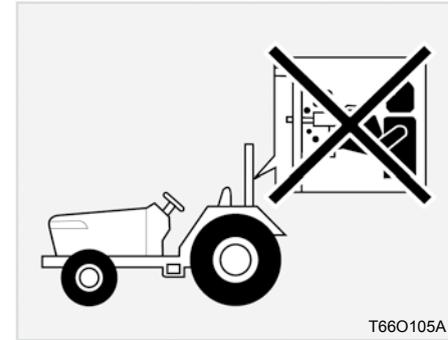




9. Never operate this tractor or any other agricultural equipment while under the influence of alcohol, drugs or while fatigued.
10. While working in cooperation with other tractors always communicate your intentions.
11. Do not start your tractor by shorting across the starter.



12. Never start the engine while standing on the ground.
13. Only the operator should ride on the tractor unless a passenger seat is installed. Keep bystanders away from the tractor while in operation.
14. When getting on and off the tractor, hand holds and step plates should always be used. This will help to prevent accidental slips, trips and falls.
15. Be sure to scrape off mud or soil from your shoes before mounting the tractor.



16. All persons using the tractor should have knowledge of its proper operation and should read this manual carefully.
17. Never get off the tractor without setting the parking brake, lowering the implement to the ground and shutting of the tractor.
18. No alterations should be made to your **KIOTI** tractor.



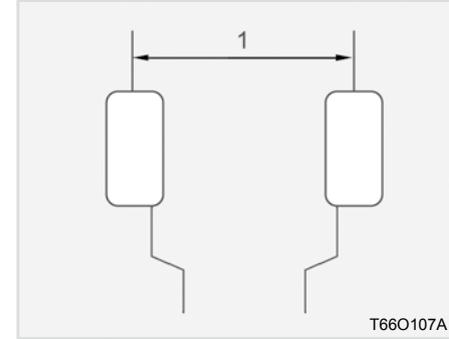
19. Before starting your tractor you should depress the clutch and make sure that all shift levers are in the neutral position and parking brake is applied.
20. For your safety, a **ROPS** with a seat belt is recommended for all applications.

NOTE

- Always use seat belt when the tractor is equipped with a **ROPS** and **CAB**. **NEVER USE THE SEAT BELT WHEN TRACTOR IS NOT EQUIPPED WITH A ROPS.** (ROPS: Roll-Over Protective Structures)

A **ROPS** and **CAB** should never be modified by welding, grinding or cutting, as this can weaken the **ROPS** structure. If any components of the **ROPS** unit is damaged, it must be replaced.

If the **ROPS** unit is removed or loosened for any reason, the parts should be fitted back to their original positions and all bolts should be properly torqued.

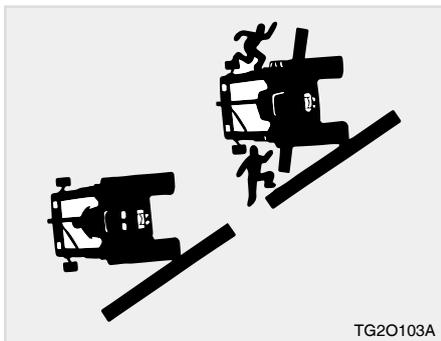


(1) Tread

21. Extra caution should be taken when driving tractors with narrow tread widths. For added stability you should adjust your rear wheel tread width.



RISK OF OVERTURNING



⊕ IMPORTANT

- The safe working practices listed hereunder concerns only a few cases of overturning risk.
- The list is therefore **NOT** comprehensive of all possible cases.

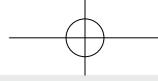


For your safety, tractors must be equipped with original safety belts.

In case of overturning, hold firmly the steering wheel e DO NOT try to get off the seat until the tractor has come to a stop. If the doors are locked, leave the tractor through the duly indicated emergency exits.

To avoid side overturning:

- Adjust the wheels to the maximum possible track width for the type of work you are doing.
- Lock both brake pedals together before driving on road.
- Reduce your speed according to work conditions. If the tractor is equipped with a front-end loader, carry the bucket and load as low as possible.



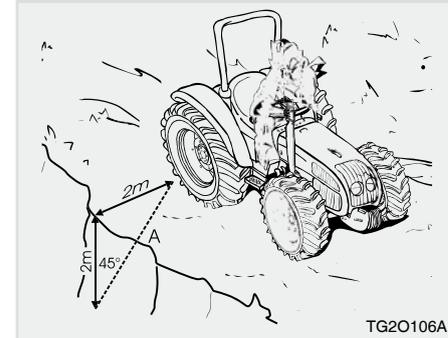
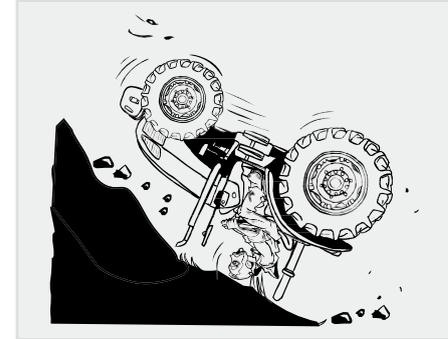
- Reduce your speed before making wide turns. DO NOT let the tractor jump or bounce on rough terrains. You could lose control.
- DON'T pull a load too heavy for your tractor. It could run away on the down slope or the tractor could jack-knife around a towed load.
- DON'T brake suddenly. Apply brakes smoothly and gradually.
- When going down a slope use the throttle to slow the tractor engine and use the same gear you would use to up the slope. Shift into gear before you start downhill.
- Engage four-wheel drive (if equipped); this will give greater stability.

⚠ WARNING

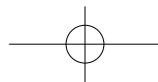
- ***NEVER disengage the clutch or attempt to shift gear after you have started downhill.***

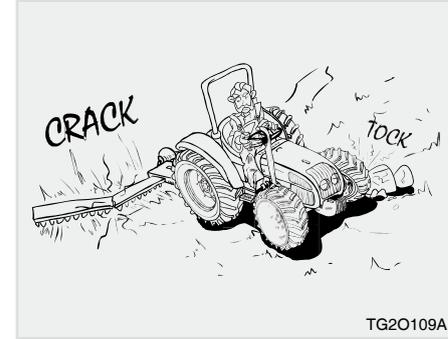
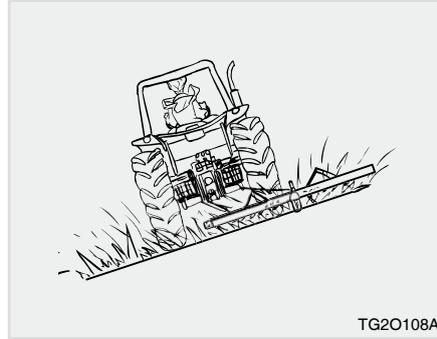
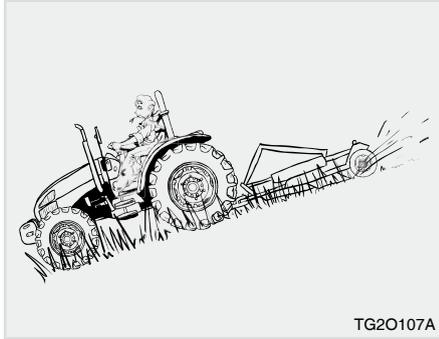


- Always go up and down slopes following a straight upward or downward line.
- Do not put any overloads on a front implement or a trailer. Use suitable counter-weights to keep the tractor stable.
- NEVER use your tractor to round up farm animals.



- When operating near ditches and banks, always keep your tractor behind the shear line. Avoid ditches, embankments and river-banks which might cave in.





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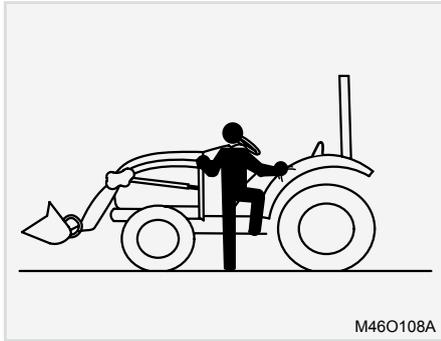
- If you need cross a steep slope, do not steer uphill, but slow down and take a wide turn. Always drive straight up or down a slope, never across it. When travelling up or down a slope, keep the heavy end of the tractor and the implement pointed uphill.

- When driving across a slope with mounted implements, keep such implements on the uphill side. Do not raise implements. Keep them as low and near to the ground as possible.

- Avoid crossing steep slopes if possible. If you must do so, avoid any holes or depressions on the downhill side. Avoid any stumps, rocks, bumps or raised areas on the uphill side.



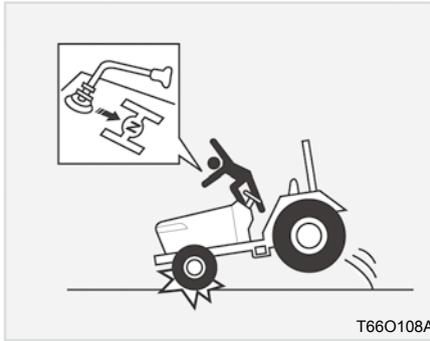
PRECAUTIONS DURING OPERATION WHEN STARTING THE ENGINE



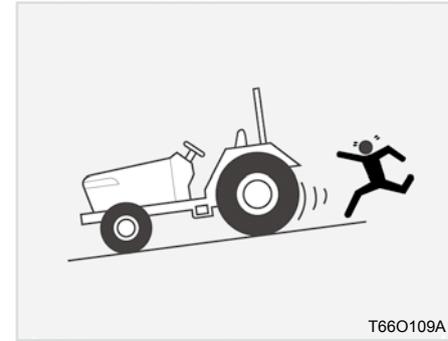
1. Enter or leave the tractor leftward gripping hand rail on a fender.

⚠ WARNING

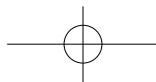
- ***Do not jump on or off the tractor. It may cause injuries. Always face the tractor, use the hand rails and steps, and get on or off slowly. Maintain a minimum three point contact to avoid falling. (Both hands on rails and one foot on the step, or one hand on the hand rail and both feet on the steps)***

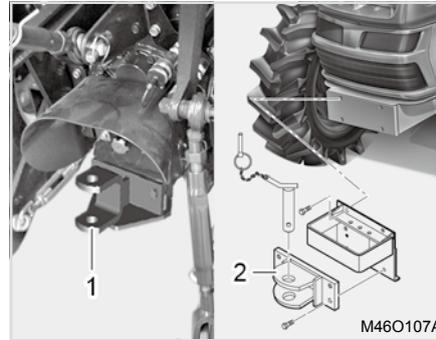
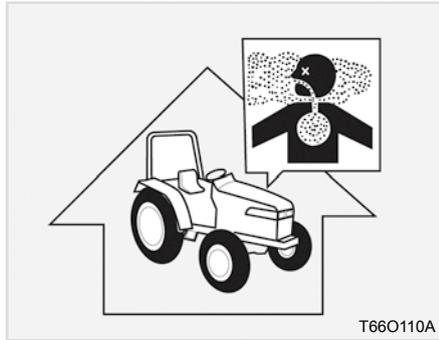
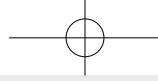


2. Avoid accidental contact with gear shift levers while the engine is running. Unexpected tractor movements can result in bodily injury or death.



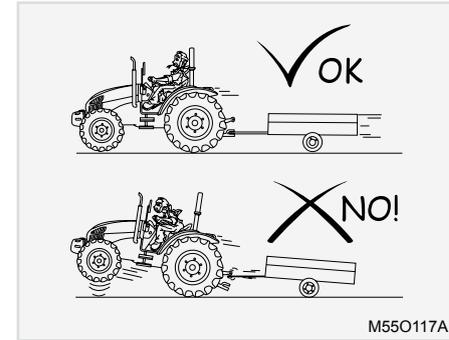
3. Do not park your tractor on a steep incline, and remember to shut "OFF" the engine and P.T.O before dismounting the tractor.





(1) Draw-bar

(2) Towing Hook



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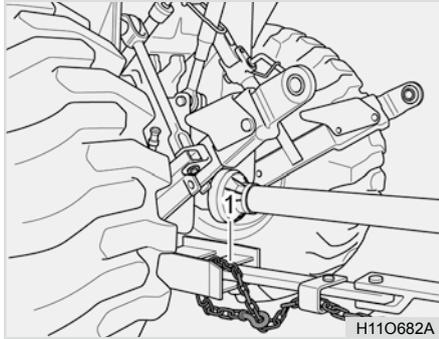
4. Do not operate your tractor in an enclosed building without the proper ventilation. Carbon monoxide inhalation can cause serious injury or death.

5. Make sure that all pressure lines are tight before starting the tractor.

6. The front hitch receiver can be installed on front axle frame. Pull only from the draw-bar and front hitch receiver. **NEVER HITCH ANYTHING TO THE AXLE HOUSING OR ANY OTHER POINT EXCEPT INDICATED POINTS.** Pulling from any other location only increase the risk of serious personal injury or death.

7. Improper use of the draw-bar, even if correctly positioned, can cause a rear overturn.

8. Do not overload an attachment or towed equipment. Use proper counterweights to maintain tractor stability. Hitch heavy loads to the draw-bar only.

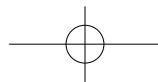


Using the proper adaptor parts, attach the chain to the tractor draw-bar support or other specified anchor location. Provide only enough slack in the chain to permit turning. See your Dealer for a chain with a strength rating equal to, or greater than the gross weight of the towed machine.



9. Check for correct coupling between tow hook and trailer. See the Towing Attachments chapter.
10. Use ballast weight as recommended. Never add more ballast to compensate a higher load than allowed. Reduce load for safety.
11. A safety chain will help control drawn equipment should it be accidentally separated from the draw-bar while transporting.

12. If the front of the tractor tends to rise up when heavy implements are attached to the three point hitch, weights should be installed on the tractor. Do not operate the tractor with a light front end.



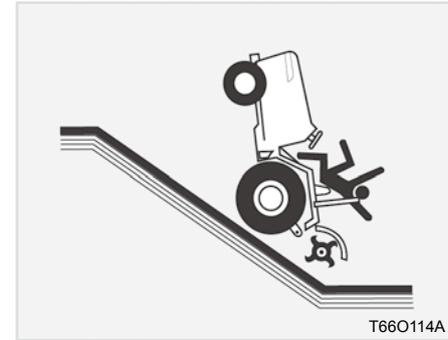


13. Always use the proper ballast weight on your tractor when using rear implements.
14. Watch front and rear to avoid obstacles at row ends, near trees and around other obstructions.

15. Do not leave equipment in the raised position when the vehicle is stopped or unattended.
16. When using implements or attachments with your tractor you should first read their respective owner's manual. You should always keep their safe operation procedures in mind.

17. YOU SHOULD BE FAMILIAR WITH YOUR EQUIPMENT AND ITS LIMITATIONS.

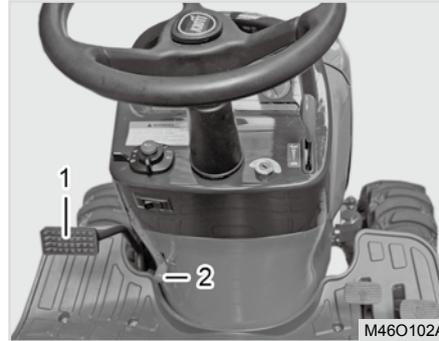
18. If abused or used incorrectly, your tractor can become dangerous to you and bystanders. Overloading your tractor or using unsafe equipment can also be dangerous and should be avoided. Refer to the "Specifications of Implement Limitation", which outlines the maximum load for safe tractor operation.



19. Driving forward out of a ditch or steep inclines can cause the tractor to tip over backwards. To avoid this you should back out of these positions. Four wheel drive tractors can give you a false sense of security in the tractors ability to maneuver out of these positions, so extra caution should be taken.
20. Never try to get on or "OFF" a moving tractor.



WHEN DRIVING THE TRACTOR



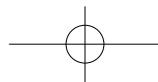
(1) Brake Pedal (2) Parking Brake

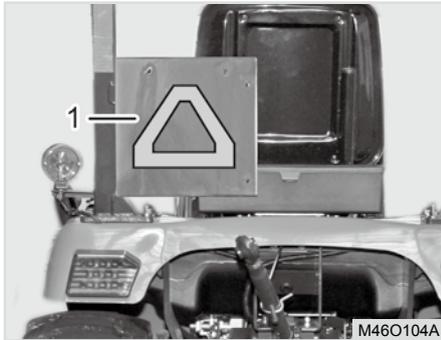


21. When working in groups, always let the others know what you are going to do before you do it.
22. Never "freewheel" by disengaging the clutch or shifting into neutral while descending a slope as this could lead to a loss of control.
23. Do not operate near ditches, holes, embankments, or other terrain features which may collapse under the tractor's weight. The risk of tractor upset is even higher when the ground is loose or wet.

1. Depress the brake pedal firmly when making an emergency stop. Uneven braking at road speeds could cause the tractor to tip over.

2. Always slow the tractor before turning. Turning at high speed may tip the tractor over or cause a loss of control.



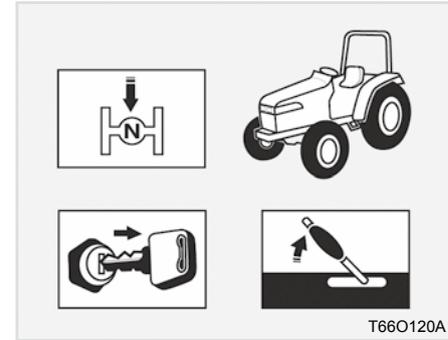


(1) SMV Emblem

3. Make sure that the Slow Moving Vehicle (SMV) sign is clean and visible. Use hazard lights as required.

4. Observe all local traffic and safety regulations.
5. Turn the headlights "ON". Dim them when meeting another vehicle.
6. Drive at speeds that allow you to maintain control at all times.
7. Do not apply the differential lock while traveling at road speeds the tractor may run out of control.
8. Avoid sudden movements of the steering wheel as this can cause a loss of control of the tractor. This risk is especially great when traveling at road speeds.
9. Do not operate an implement while the tractor is on the road. Lock the three point hitch in the raised position.
10. When towing other equipment, use a safety chain and place an SMV emblem on it as well.

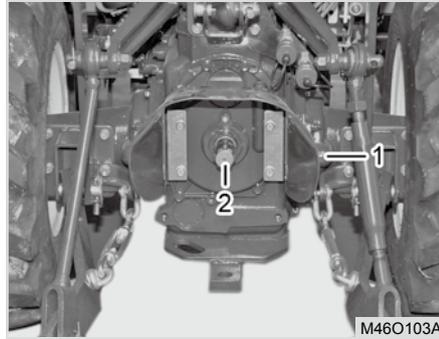
WHEN PARKING THE TRACTOR



1. Disengage the P.T.O, lower all implements, place all control levers in the neutral position, set the parking brake, stop the engine and remove the key.



WHEN OPERATING THE P.T.O



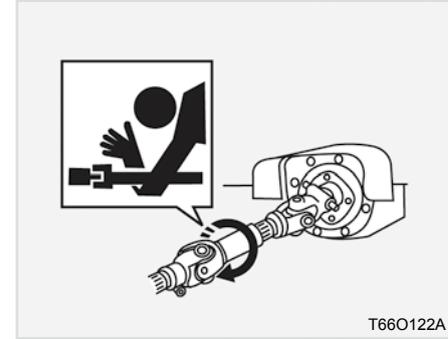
(1) P.T.O Shaft Cover (2) P.T.O Shaft Cap

1. Make sure the tractor is completely stopped, gears are in neutral and all moving components have completely stopped before connecting, disconnecting, adjusting, cleaning or servicing any P.T.O driven equipment.
2. Keep the P.T.O shaft cover in place at all times. Replace the P.T.O shaft cap when the shaft is not in use.
3. Before installing or using P.T.O

driven equipment, read the workshop manual and review the safety labels attached to the equipment.

WARNING

- **Before driving an implement through the PTO, always make sure that all bystanders are well away from the tractor.**
- **When using the PTO drive with a stationary tractor, always make sure that the gears are in neutral and that the parking brake is applied.**
- **Before starting up any PTO-driven implement hitched to the three-point linkage, lift the implement to its full height and check that at least 1/4 of the total length of the telescopic section of the drive shaft is engaged.**
- **Ensure that implements and attachments are properly installed and that the tractor and implement PTO RPM ratings match.**

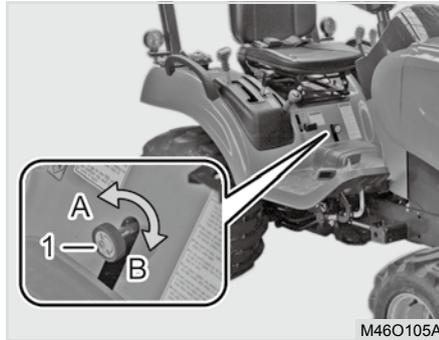


4. When operating stationary P.T.O driven equipment, always apply the tractor parking brake and place chocks behind and in front of the rear wheels. Stay clear of all rotating parts.
5. Do not attach a P.T.O driven implement if the implements safety shields are damaged or not in place. Rotating shafts are an entanglement hazard.



SAFETY PRECAUTIONS DURING SERVICING

WHEN USING THE 3-POINT HITCH



(1) 3-point hitch lowering speed knob
(A) "FAST" (B) "SLOW"

1. Use the 3-point hitch only with equipment designed for 3-point hitch usage.
2. When using a 3-point hitch mounted implement, be sure to install the proper counterbalance weight on the front of the tractor.
3. When transporting on the road, set the implement lowering control in the "LOCK" position to hold the implement in the raised position.

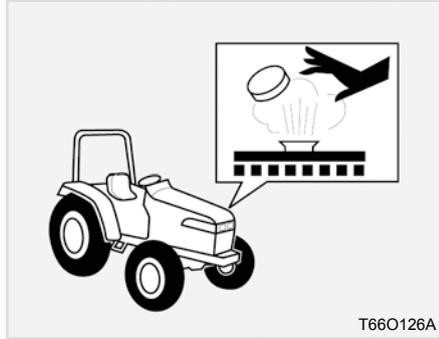
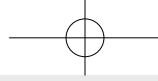


In order to service your tractor you must park it on a flat level surface, set the parking brake, place the gear shift lever in neutral and stop the engine.

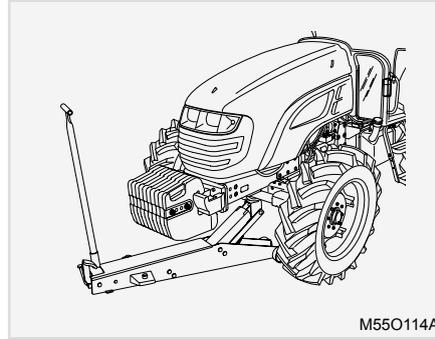
1. Do not smoke while working around the battery or when refueling your tractor. Keep all sparks and flames away from the battery and fuel tank. The battery presents an explosive hazard because it vents off hydrogen and oxygen gas, especially when recharging.



2. Allow the tractor time to cool "OFF" before servicing any part that may have become hot while the tractor is running.
3. You must always stop the engine before refueling the tractor. Avoid overfilling the tractor or spilling the fuel.
4. Before jump starting a dead battery, read and follow all of the instructions.
5. It is recommended to keep a first aid kit and fire extinguisher handy at all times.



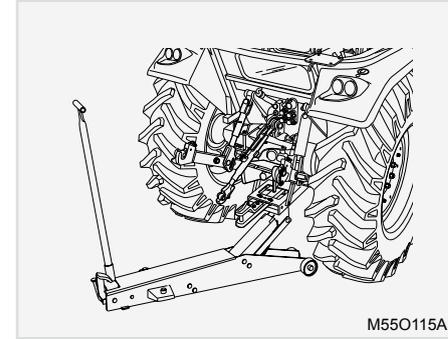
6. Do not remove the radiator cap while the coolant is hot. When cool, slowly rotate the cap to the first stop and allow sufficient time for excess pressure to escape. After all the pressure is released remove the cap completely. If your tractor is equipped with a coolant recovery tank, add coolant there rather than to the radiator.



7. If the tractor must be lifted for servicing, take it to a suitably equipped workshop.

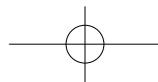
8. Carry out the following operations before any operation about the tractor: Engage the four-wheel drive, the first gear and the parking brake and put chocks to the wheels touching the ground.

9. Before lifting the tractor, apply wooden wedges to the front axle to avoid its swinging.



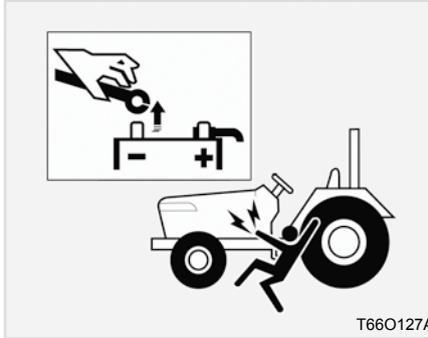
10. Use jack lifts of suitable capacity and apply them at the center of the front and rear axles while paying due attention to weight distribution.

14. No decals for the lifting point are applied on the tractor, as they would be too difficult to apply in the available spaces and would be easily removed or defaced during normal operation of the tractor.



 **NOTE**

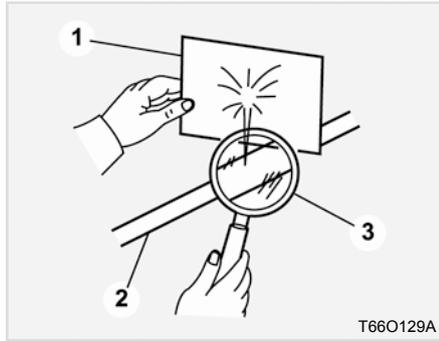
- Apply the jack lift to the lifting points according to the type of operation and follow the safety procedures given before.



1

15. When working with your tractors electrical components you must first disconnect the battery cables.
16. **TO ENSURE THAT THERE ARE NO ACCIDENTS FROM SPARKS YOU MUST FIRST DISCONNECT THE NEGATIVE BATTERY CABLE.**

17. Tire mounting should be done by qualified professionals; with the proper equipment.
18. Maintaining correct tire pressure is important for the life of your tires.
Do not inflate the tires above the recommended pressure specified in the owner's manual.
19. Securely support the tractor when changing wheels or the wheel tread width.



(1) Card Board (2) Hydraulic Line
(3) Magnifying Glass



T66O130A



T66O131A

20. Make sure that wheel bolts have been tightened to the specified torque.

21. Escaping hydraulic fluid under pressure has sufficient force to penetrate skin, causing serious personal injury. Be sure to release all residual pressure. Before disconnecting hydraulic lines.

Before adding pressure to the hydraulic system, make sure that all connections are tight and that all lines, pipes and hoses are free of damage.

22. FLUID ESCAPING FROM PIN-HOLES MAY BE INVISIBLE. DO NOT USE HANDS TO SEARCH FOR SUSPECTED LEAKS;

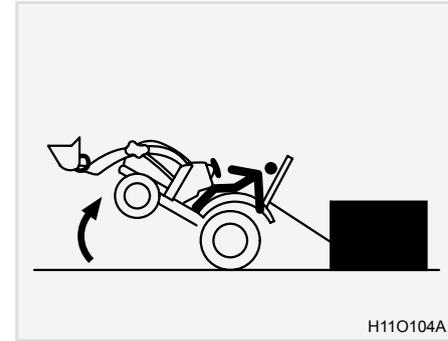
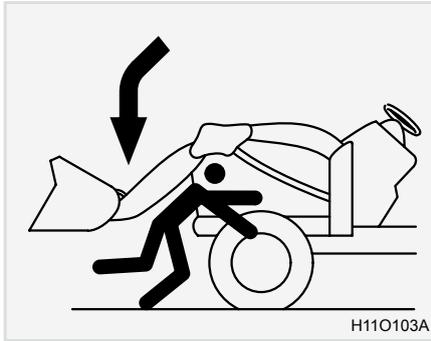
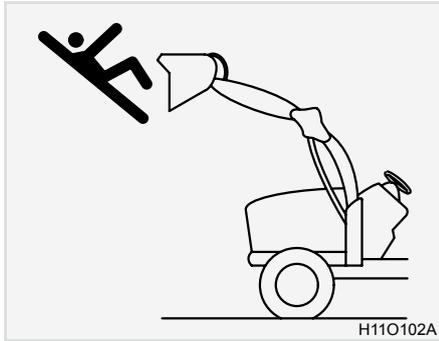
Use a piece of cardboard or wood, instead. Use of safety goggles or other eye protection is also highly recommended. If injured by escaping fluid, see a medical doctor at once. This fluid can produce gangrene and/or a severe allergic reaction.

23. Keep environmental pollution in mind. When replacing coolant or oil, dispose of it the right way.

Be sure to observe all relevant regulations when you dispose of the engine oil, transmission oil, fuel, coolant, filters and battery.



SAFETY PRECAUTIONS WHEN USING THE LOADER

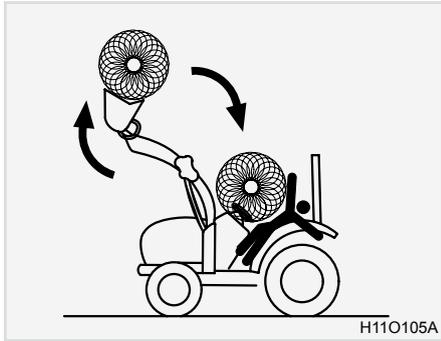


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1. Never let anyone get in the loader and use the loader as a workstation. Otherwise, it may lead to injury or even death.

2. Do not stand under the lifted loader or get close to it. Also, lower the loader arm onto the ground before leaving the tractor. Otherwise, it may lead to an injury or even death.

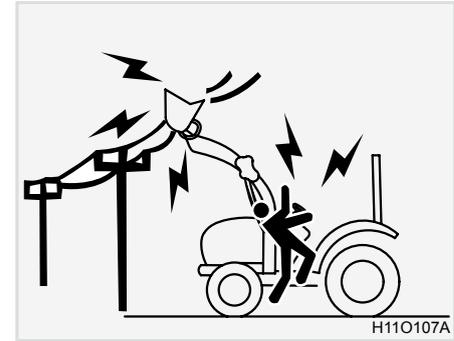
3. The loader can be turned over if a drawbar is improperly loaded. Make sure to use a drawbar proper for the 3-point hitch lower link. Otherwise, it may lead to an injury or even death.



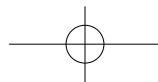
4. Never carry a big object with the loader unless a proper implement is attached. Keep a carried object low during driving. Otherwise, it may lead to an injury or even death.



5. When attaching or detaching the loader, fix all parts which are connected to the bucket and boom. The bucket or boom can be accidentally dropped down, leading to an injury or even death.



6. Do not allow loader arms or attachment to contact electrical power lines. Electrocution will cause serious injury or death.





IMPLEMENTS AND ATTACHMENTS



7. Keep bystanders away. No riders.



⊕ IMPORTANT

- **ROPS (Roll Over Protective Structure), sun canopy or cabin are not a FOPS (Falling Object Protective Structure).** It never can protect the riders against falling objects. Avoid driving the vehicle into a dangerous area such as falling rocks zone.

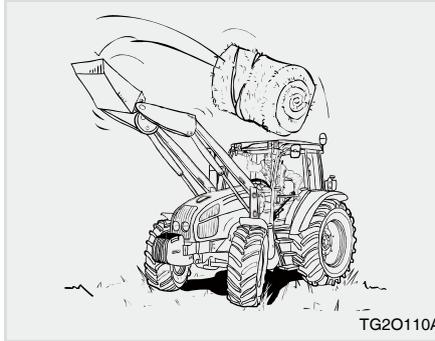
⚠ WARNING

- 1 • **Use exclusively front loader approved by the tractor's manufacturer, with CE mark and parallelogram type.**
- **The installation and modification of the tractor must be carried out with the highest technical standards by specialised workshops with qualified personnel. Such workshops must be able to guarantee and attest the risk analysis provided for in the Machinery Directive 2006/42/EC concerning the foreseen and predictable use of the tractor with front loader, in order to carry out all required adaptations of the tractor.**
- **Use the front loader and all supplied equipment as prescribed by the loader's operator manual.**



⊕ IMPORTANT

- **Keep the loader's operation manual together with the tractor's manual, always at hand in the storage compartment of the tractor.**
- **Before driving or operation your tractor, it is mandatory to read this manual very carefully, with special attention to the chapter concerning safety rules.**



⚠ WARNING

- ***Use of the front loader and of the tractor equipped with front loader, if not correctly carried out, and handling not secured loads constitute a serious danger for the operator and everyone standing by, because of the danger of falling objects.***

- Three-point hitch and side mounted implements make a much larger arc when turning than towed equipment. Make certain to maintain enough clearance for safe turning.
- To use mounted, semi-mounted or towed equipment and trailers it is required to use exclusively CE marked implements, after reading their operation handbooks carefully, giving maximum attention to risks connected with their association to the tractor.
- Implements must be hitched to the tractor by means of the three-point linkage. It is therefore necessary to check couplings for compatibility according to their classes.

The implement has to be fitted with suitable supports in order to avoid tipping or accidental shifting during hitching. Always check three-directional fastening to the tractor of the mounted or semi-mounted implement, to avoid dangerous



swinging and shaking during transport and work that could jeopardize the stability of the tractorimplement assembly.

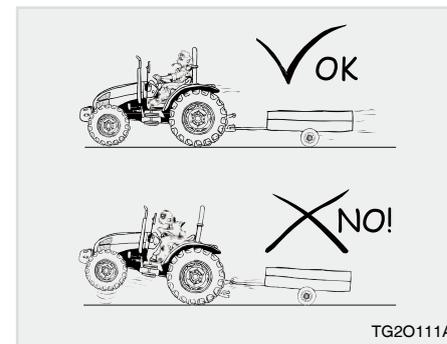
- The cardan shaft must be always CE-marked, provided with suitable guards and suitable to tractorimplement coupling. Follow all directions of the operation manual, concerning both the fastening according to connection direction and safety rules to avoid rotation of protections (chains) and overlaying of the telescopic tubes. Also keep articulation angles.

⚠ WARNING

- ***When a tractor with safety frame is equipped with a front loader, there is still a risk if the implement is improperly used. This risk is due to objects falling from above. The operator has no protection against this risk.***

To reduce risks, the following precautions should be used.

- Only use loader equipped with a load self-levelling system, i.e. of the parallelogram type.
- Only use specific implements for the operation to be performed. Strictly follow the directions and warnings in the loader's operation manual.
- Use the machine and the implement with caution, drive on plane ground and avoid pits, excavations and ditches. Do not turn, start or stop abruptly.
- If a front loader is mounted, it is advisable to use a tractor with cab or with a 4-post frame with FOPS safety system. The loader installer should carefully analyze all risks and make all required adjustments.



- Hitch loads to the drawbar only. Towing or attaching to other locations may cause the tractor to overturn.
- Improper use of the drawbar, even if correctly positioned, can cause a rear overturn.
- DO NOT overload an attachment or towed equipment. Use proper counterweights to maintain tractor stability. Hitch heavy loads to the drawbar only.



CLEANING THE TRACTOR

- Check for correct coupling between tow hook and trailer. See the Towing Attachments section.
- Use ballast weight as recommended. NEVER add more ballast to compensate a higher load than allowed. Reduce load.
- Keep work surfaces and engine compartments clean. • Before cleaning the machine, always lower implements to the ground, engage the first gear, engage the parking brake, turn the engine off and remove the key.
- Always use specific personal safety devices for each service operation.
- Clean steps, pedals and floor. Remove grease or oil. Brush away dust or mud. In winter, scrape away snow and ice. Remember - slippery surfaces are dangerous.
- Avoid using petrol, paraffin, paint thinner etc. when cleaning plastic parts, e.g.; console, instrument cluster, monitors and gauges etc. Use ONLY water, mild soap and a soft cloth when you clean these parts. Using petrol, paraffin, paint thinner etc., will cause cracking or deformation of the part being cleaned.
- Remove and put away any tools, buckets, chains and hooks.



SAFETY DECAL MAINTENANCE DECAL MOUNTING LOCATION

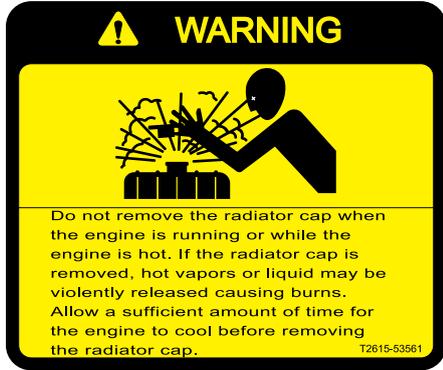


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TB30102A

DECALS

(1) Part No. : T2555-52281



(3) Part No. : T2555-52611



(2) Part No. : T4625-52351



(4) Part No. : T2555-52331



(5) Part No. : T2555-52541





(6) Part No. : T2555-52141

⚠ WARNING

- Before starting and operating
 - Know the operating and safety instructions in the operators manual and on the tractor.
 - Clear the area of bystanders.
 - Locate and know operation of controls.
 - Fasten your seat belt.
- Start engine only from operators seat with transmission in neutral, PTO disengaged and hydraulic controls in lowered position.
- Slow down on turns, rough ground and slopes to avoid upset.
- Do not permit anyone but the operator to ride on the tractor. There is no safe place for riders.
- Lock braker together, use warning lights and SMv emblem while driving on roads.
- Lower equipment, place gear shift levers in neutral, stop engine and apply parking brake before leaving tractor seat.
- Avoid accidental contact with rear shift lever while engine is running. Unexpected tractor movement can result.

FAILURE TO FOLLOW ANY OF THE INSTRUCTIONS ABOVE CAN CAUSE SERIOUS INJURY TO THE OPERATOR OR OTHER PERSONS.

(Replacement manuals are available from your local dealer)
T2555-52141

(7) Part No. : T4182-53191

⚠ WARNING

TO AVOID POSSIBLE INJURY, DEATH OR LOSS OF PROPERTY FROM A MACHINE RUNAWAY

- With the engine off, unexpected machine movement could result regardless of the gear shift position.
- Before dismounting the machine, apply the parking brake to prevent machine runaway.

T4182-53191

(9) Part No. : T2555-52471



3PT must be completely raised prior to adjusting CUTTING HEIGHT.

T2555-52471

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(8) Part No. : T2555-52231

⚠ WARNING



Operate controls only from Tractor seat.

Failure to comply could result in death or serious injury.

T2555-52231

(10) Part No. : T2555-52311

⚠ WARNING

Do Not operate with shield removed. Failure to comply could result in death or serious injury.

T2555-52311



(11) Part No. : T2555-52351

	⚠ D A N G E R		
	<ul style="list-style-type: none"> ● Improper operating of tractor can rollover or upset ● DO NOT operate vehicle without raised ROPS and locking pins in position. ● DO NOT attach ropes or chains to ROPS for pulling. 	<ul style="list-style-type: none"> ● Lower the ROPS for low clearance ONLY. <ul style="list-style-type: none"> - DO NOT fold ROPS with a canopy attached. - Seat belt is not recommended with ROPS lowered. - NO protection is provided in lowered position. 	

(12) Part No. : T2555-52262

⚠ D A N G E R	
	
<p>Pull only from approved drawbar or lower links of 3-point linkage at horizontal position or below.</p>	<p>Rotating driveline contact may cause serious injury or death.</p> <p>Keep all driveline, tractor and equipment shield in place during operation.</p> <p style="text-align: right; font-size: 0.8em;">T2555-52262</p>



(13) Part No. : TD26-1009A

⚠ WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel

TD26-1009

CAUTIONS FOR DECAL MAINTENANCE

Safety decals are attached to the tractor for safe operation. Make sure to follow the instruction on the decals as well as the following instruction:

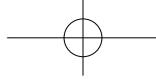
⚠ CAUTION

- **Keep the decals clean and intact. If any decal is dirty, wash it with soap and dry with a soft cloth.**
- **Never use a solvent, such as thinner or acetone, since it can ruin the decals.**
- **Do not spray high-pressure water directly onto the decal. The decal may fall off the tractor.**

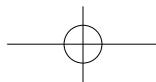
⊕ IMPORTANT

- **If a decal is damaged or lost, contact your local KIOTI dealer immediately to install a new decal.**
- **Make sure to attach the decal to the correct position cleanly without bubbles after cleaning its mounting surface.**
- **If a decal is attached to a component to be replaced, replace the decal as well.**

1



MEMO





PRECAUTIONS BEFORE OPERATION

VEHICLE IDENTIFICATION NUMBER..... 2-2

PRODUCTION NUMBER2-2

ENGINE NUMBER2-2

TRANSMISSION NUMBER.....2-2

ESSENTIAL REPLACEMENT PARTS 2-4

OILS AND FLUIDS2-4

FILTERS2-4

BELTS AND RUBBER PARTS.....2-5

OTHER COMPONENTS2-5

2

2



VEHICLE IDENTIFICATION NUMBER PRODUCTION NUMBER



(1) S/N Identification Plate

This number is to identify the vehicle, and its plate is attached on the front right side of the front axle frame.

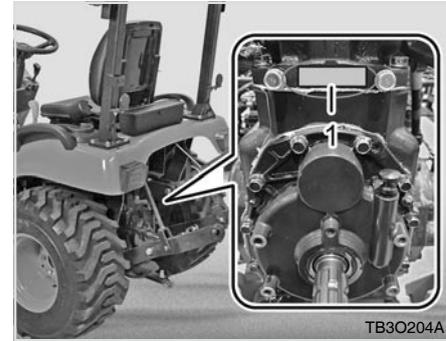
ENGINE NUMBER



(1) Engine Serial Number

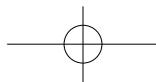
The engine number is engraved on the mounting surface of the cylinder block injection pump.

TRANSMISSION NUMBER



(1) Transmission Serial Number

The transmission number is stamped on the transmission case on the P.T.O cover.





Your dealer is interested in your new tractor and has the desire to help you get the most value from it. After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself.

However, when in need of parts, warranty or major service, be sure to see your **KIOTI** dealer. For service, contact the **KIOTI** dealership from which you purchased your tractor or your local authorized **KIOTI** dealer.

When in need of parts, be prepared to give your dealer both the tractor and engine serial numbers.

Before using non-**KIOTI** approved implements, contact your nearest dealer, regarding safety application of the implement.

• **Tractor Model Name:**

• **Tractor Serial No:**

• **Engine Serial No:**

• **Date of Purchase:**

To be filled in by purchaser.

ESSENTIAL REPLACEMENT PARTS OILS AND FLUIDS

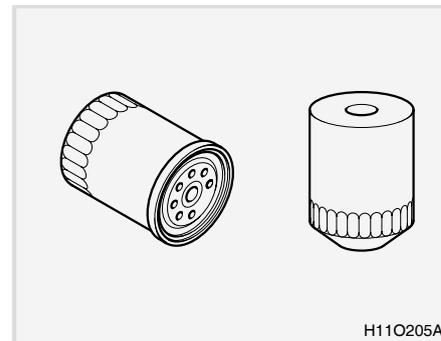


Various oils and fluids are used in this tractor for operation, lubrication, cooling, and anti-corrosion of various parts. If oil or fluid is insufficient, contaminated or degraded, it can cause poor performance, incorrect operation, and seized parts of the tractor, leading to malfunctions.

Regularly add or change the fluid specified below keep the tractor in perfect condition.

ITEM	SPECIFICATION	U.S. gal. (L)
Engine Oil	SAE 15W40 (above -10℃)	1.0 (3.8)
Transmission fluid	DAEDONG UTF55 Exxonmobil Mobilfluid 424 BP: Tractran UTH Exxonmobil Hydraulic 560 Shell: Donax TD	2.75 (10.4)
Grease	SAE multi purpose type grease	Apply in moderation
Anti-freeeze	Fresh clean water with ethylene glycol (50:50)	0.87 (3.3)

FILTERS

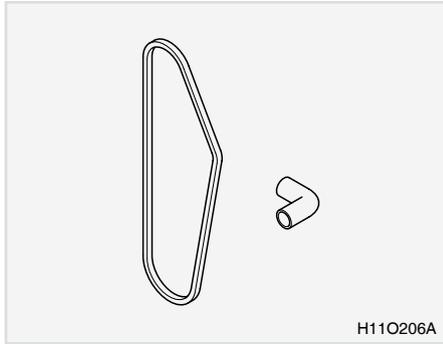


Filters for the engine, transmission, air cleaner, and A/C are consumables that purify oil and air. Make sure to replace these items when changing oil.

PART NO	DESCRIPTION	QTY
E5205-32091	Engine oil filter	1
T2555-38031	Hydraulic filter	1
T2555-38021	HST Hyd. filter	1
T2555-55411	Fuel Filter	1
T2555-11011	Air filter	1



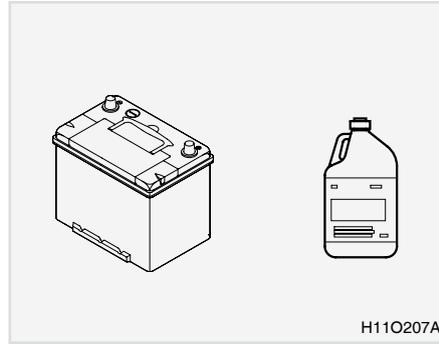
BELTS AND RUBBER PARTS



Belts, hoses and boots, which are made of rubber, get weakened and cracked as they age. If these parts remain in this state, they can be broken "OFF", leading to a serious problem in the tractor. Therefore, regularly replace the items indicated below to prevent an accident.

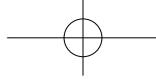
PART NO	DESCRIPTION	QTY
EC16-0002A	Fan belt	1

OTHER COMPONENTS



The battery is a very important consumable component that supplies power to the alternator when the engine is started.

Therefore, make sure to check its discharging condition daily, including its life span and electrolyte condition.



MEMO





SPECIFICATIONS

GENERAL SPECIFICATIONS	3-2
EXTERNAL DIMENSIONS	3-2
MAJOR SPECIFICATIONS	3-3
OPTION LIST	3-6
NOISE LEVELS AS PERCEIVED BY THE OPERATOR	3-7
VIBRATION LEVELS OF THE TRACTOR EXPOSITION TO VIBRATIONS	3-7
IMPLEMENT LIMITATIONS	3-9
STANDARD IMPLEMENT DIMENSIONS	3-9

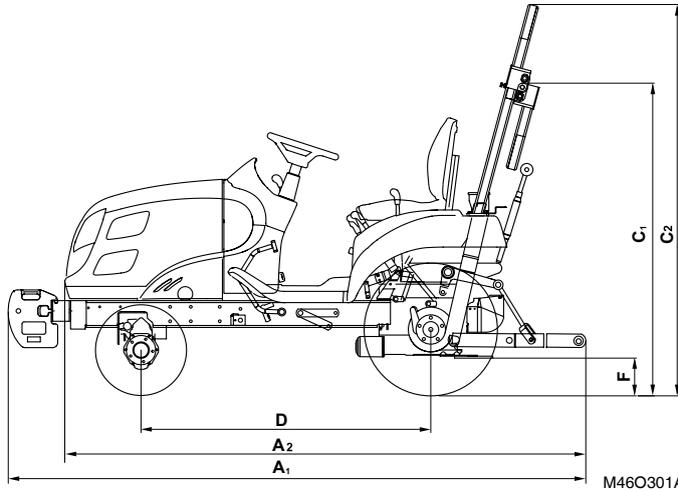
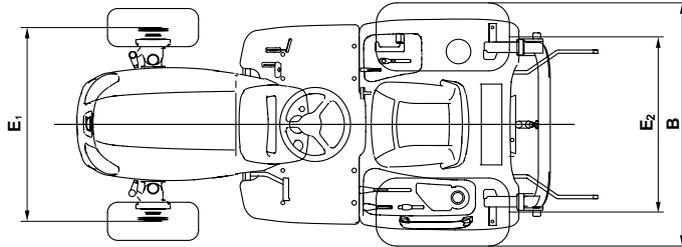
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3



GENERAL SPECIFICATIONS EXTERNAL DIMENSIONS

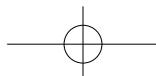
in. (mm)



M46O301A

ITEM	CS2220H(S) / CS2520H(S)
1. Overall length (A1)	110.25 (2,800)
2. Overall length (A2)	99.33 (2,523)
3. Overall width (B)	45.98 (1,168)
4. Overall height (C2)	87.63 (2,226)
5. Wheel base (D)	55.12 (1,400)
6. Tread (E1)	36.33 (923)
7. Tread (E2)	34.01 (864)
8. Min. ground clearance (F)	6.38 (162)

- ※ A1: Overall length including weights
- A2: Overall length excluding weights
- C1: Overall height with folded ROPS
- C2: Overall height with raised ROPS
- E1: Front wheel tread
- E2: Rear wheel tread





MAJOR SPECIFICATIONS

ITEM		CS2220H(S)	CS2520H(S)	REMARK	
Engine	Model	3C100LWH-U3	3C100LFH-U2		
	Number of cylinders	3			
	Total displacement	cc	1,007		
	Bore and stroke	in. (mm)	2.95 x 2.99 (75 x 76)		
	Engine gross power	HP (kw)	21 (15.7)	24.5 (18.3)	
	Rated revolution	rpm	3,200		
Capacities	Fuel tank	U.S.gal. (L)	6.7 (25.5)		
	Engine oil (included filter)	U.S.gal. (L)	1.0 (3.8)		
	Transmission oil	U.S.gal. (L)	2.75 (10.4)		
	Engine coolant	U.S.gal. (L)	0.87 (3.3)		
	Front axle oil	U.S.gal. (L)	0.53 (2.0)		
Drive train	Clutch		None		
	Transmission	Type	HST		
		Main	Infinite		
		Range	2 range (High/Low)		



3-4 CS2220H(S)/CS2520H(S)

ITEM		CS2220H(S)	CS2520H(S)	REMARK	
Drive train	Ground speed(Tire for Industrial) mp/h (km/h)	Forward 3,200 rpm	0~9.57 (0~15.4)	With industrial tire	
		Reverse 3,200 rpm	0~6.6 (0~10.6)	With industrial tire	
	4-wheel drive		Mechanical		
	Quick turn (QT)		None		
	Brake		Wet disk type		
	Differential lock		Rear Standard		
Tires	Industrial	Front	18 x 8.5 - 10 R4		
		Rear	26 x 12.00 - 12 R4		
	Turf	Front	18 x 8.5 - 10 R3		
		Rear	26 x 12.00 - 12 R3		
Hydraulic system	Pump capacity gpm (L / min)		6.97 (26.4)		
	Steering		Hydraulic Power Steering		
	Hydraulic lift control		Inching		
	3-point hitch		SAE Category I		
	Max. lifting capacity lbs. (kg)	24in. (61cm) Behind		700 (318)	
		Lower link end		1,580 (715)	



MODEL		CS2220H	CS2220HS	CS2520H	CS2220HS	REMARK	
P.T.O	Rear	Type	Independent				
		P.T.O shaft	1- 3/8" 6 splines				
		Speed (P.T.O rpm/engine rpm)	540/3,186				
	Mid (optional)	P.T.O shaft (*)	16/32" 15 splines				
		Speed (P.T.O rpm@engine rpm)	2,200@3,235				
	Min. turning radius (with one rear wheel braked) feet (m)		-				
Weight (with ROPS) lbs. (kg)		1,554 (705)	1,532 (695)	1,554 (705)	1,532 (695)		

(*): In compliance with A.S.A.E. standards



OPTION LIST

	CS2220H / CS2520H	CS2220HS / CS2520HS
Front Weight	○	X
Rear Weight	○	○
Remote Hydraulic Valve	○	○
Joystick valve	STD.	STD.
Front Work Light	○	○
Rear Work Light	○	○
Cruise	STD.	STD.
Seat Armrest	○	○
Sun Canopy	○	○
Front Hitch	○	○
Front Grille Guard	○	○
SMV sign	○	○
Filter Guard	○	○
3rd Function Joystick	○	○



NOISE LEVELS AS PERCEIVED BY THE OPERATOR

The following tables give the noise level values, measured from the driver's seat in instantaneous conditions in compliance with standards 2009/76/EC(dBA) - annex II (without load) - and when driving by in compliance with standard 2009/63/EC(dBA).

Tractors without Cabin			
Model	Directive of The European Parliament and of the Council	Noise level at the operator's ear according to 2009/76/EC	Noise level in motion according to 2009/63/EC
CS2220H(S)/CS2520H(S)	2003/37/EC	85.8 dB(A)	80.0 dB(A)

※ Note: Data supplied by the manufacturer, approval values pending.

3

VIBRATION LEVELS OF THE TRACTOR EXPOSITION TO VIBRATIONS

WARNING

- *The vibration level transmitted to the body as a whole depend on different parameters, some of them relating to the machine, others to the terrain and many specific for the operator. The prevailing parameters are the type of terrain or work surface and the ground speed.*
- *Vibrations cause discomfort for the operator and in some cases put his/her health and safety at risk.*
- *Make sure that the tractor is in good condition and that all routine servicing is correctly and regularly carried out.*
- *Check tire pressure and the steering and braking systems.*
- *Check that the operator's seat and adjustment systems are in good condition, then adjust the seat to the operator's weight and size.*

IMPORTANT

- **More information on Whole Body Vibration (WBV) on agricultural tractors can be found in more specific publications and the relative risks can be taken into account following the laws of the country. In order to correctly estimate statistical values based on your daily work on the tractor, a specific measure instrument is required, such a three-axis accelerometer applied to the seat**



In accordance to EU Directive 78/764/EC the following table shows vibration levels measured on seats, in aws.

Operator's Vibration level			
Seat type	Directive of The European Parliament and of the Council	Light-weight operator	Heavy-weight opeartor
W08SSS	78/764/EEC	1.24 m/s ²	1.24 m/s ²

* aws = correct weighted value of the vibration acceleration (m/s²)



IMPLEMENT LIMITATIONS STANDARD IMPLEMENT DIMENSIONS

This **KIOTI** tractor has been thoroughly tested for proper performance with implements sold or approved by **KIOTI**. Use with implements which are not sold or approved by **KIOTI** and which exceed the maximum specifications listed below, or which are otherwise unfit for use with this **KIOTI** tractor may result in malfunctions or failures to the tractor, damage to other property and injury to the operator or others. [Any malfunctions or failures to the tractor resulting from use with improper implements are not covered by the warranty.]

Model	Item	Tread (max. width)		Lifting Capacity max. loading weight W_0 (24 in. aft of hitch)
		Front	Rear	
ALL		930 mm (36.6 in.)	870 mm (34.3 in.)	318 kg (701 lbs.)

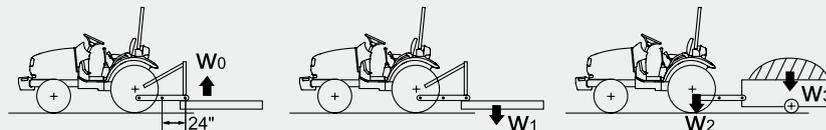
Model	Item	Actual figures		Trailer loading weight W_3 Max. capacity
		Implement weight W_1 and / or size	Max. Drawbar Load W_2	
ALL		As in the following list (shown on the next page)	310 kg (683 lbs.)	2,000 kg (4,409 lbs.)

Lifting Capacity max. loading weight The max. allowable load which can be put on the 24 in. aft of hitch : W_0

Implement weight The implement's weight which can be put on the lower link : W_1

Max. drawbar load W_2

Trailer loading weight The max. loading weight for trailer (without trailer's weight) : W_3



S42O301A

NOTE : Implement size may vary depending on soil operating conditions.

in. (mm)

IMPLEMENT	DESCRIPTION	CS2220H(S)/CS2520H(S)	REMARKS
Loader	Max. Bucket width	66 (1,676)	
Backhoe with sub frame	Max. Digging depth	90 (2,280)	Do not use 3 point hitch while operating backhoe
Tiller	Max. Working width	65 (1,650)	
Box blade	Max. Cutting width	84 (2,133)	
Rear blade	Max. Cutting width	84 (2,133)	
Rotary cutter	Max. Cutting width	65 (1,650)	
Grooming mower	Max. Cutting width	72 (1,828)	
Aerator	Max. Width	72 (1,828)	
Landscape rakes	Max. Cutting width	84 (2,133)	



DESCRIPTION OF OPERATING SYSTEM

4

4

EXTERIOR VIEW 4-3

MOUNTING LOCATION	4-4
KEY SWITCH.....	4-4
COMBINATION SWITCH.....	4-7
HAZARD LAMP SWITCH	4-8
CRUISE OPERATION SWITCH (OPTIONAL) ...	4-9

INSTRUMENT PANEL 4-10

VIEW	4-10
TACHOMETER/HOUR METER INDICATOR... 4-11	
FUEL GAUGE	4-11
ENGINE COOLANT TEMPERATURE GAUGE... 4-12	
ENGINE OIL PRESSURE WARNING LAMP ... 4-12	
BATTERY CHARGING LAMP	4-13
TURN SIGNAL LAMP	4-13
GLOW PLUG INDICATOR.....	4-14
CRUISE LAMP (OPTIONAL)	4-14

OPERATING THE CONTROLS 4-15

HST RANGE GEAR SHIFT LEVER.....	4-16
BRAKE PEDAL	4-16
PARKING BRAKE LEVER	4-17

FRONT WHEEL DRIVE LEVER	4-17
FORWARD/REVERSE DRIVING PEDALS ...	4-18
HAND THROTTLE LEVER	4-18
DIFFERENTIAL LOCK PEDAL	4-19
PTO SWITCH (ON / OFF).....	4-20
PTO SHIFT LEVER.....	4-20
CUTTING HEIGHT ADJUSTMENT LEVER... 4-21	
SEAT ADJUSTMENT	4-22

HYDRAULIC SYSTEM..... 4-23

POSITION CONTROL LEVER.....	4-23
LIFTING ARM (LOWER LINK) SPEED CONTROL LEVER	4-24
DOUBLE ACTING LEVER (OPTIONAL).....	4-24
AUXILIARY PORT (OPTIONAL).....	4-25
PTO SHAFT COVER & CAP	4-25

ACCESSORY SYSTEM 4-26

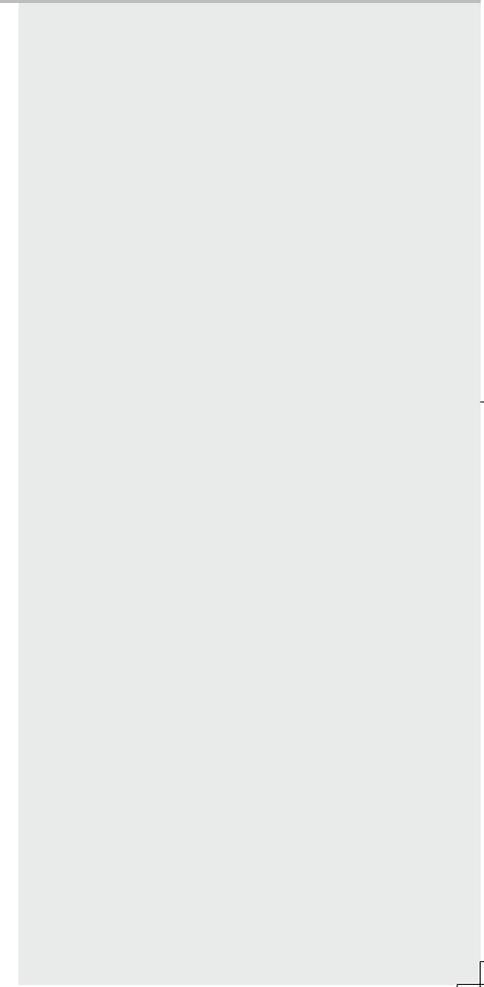
POWER SOCKET & USB CHARGE.....	4-26
CUP HOLDER	4-26
TOOL BOX.....	4-27

TIRES, WHEELS AND BALLAST 4-27



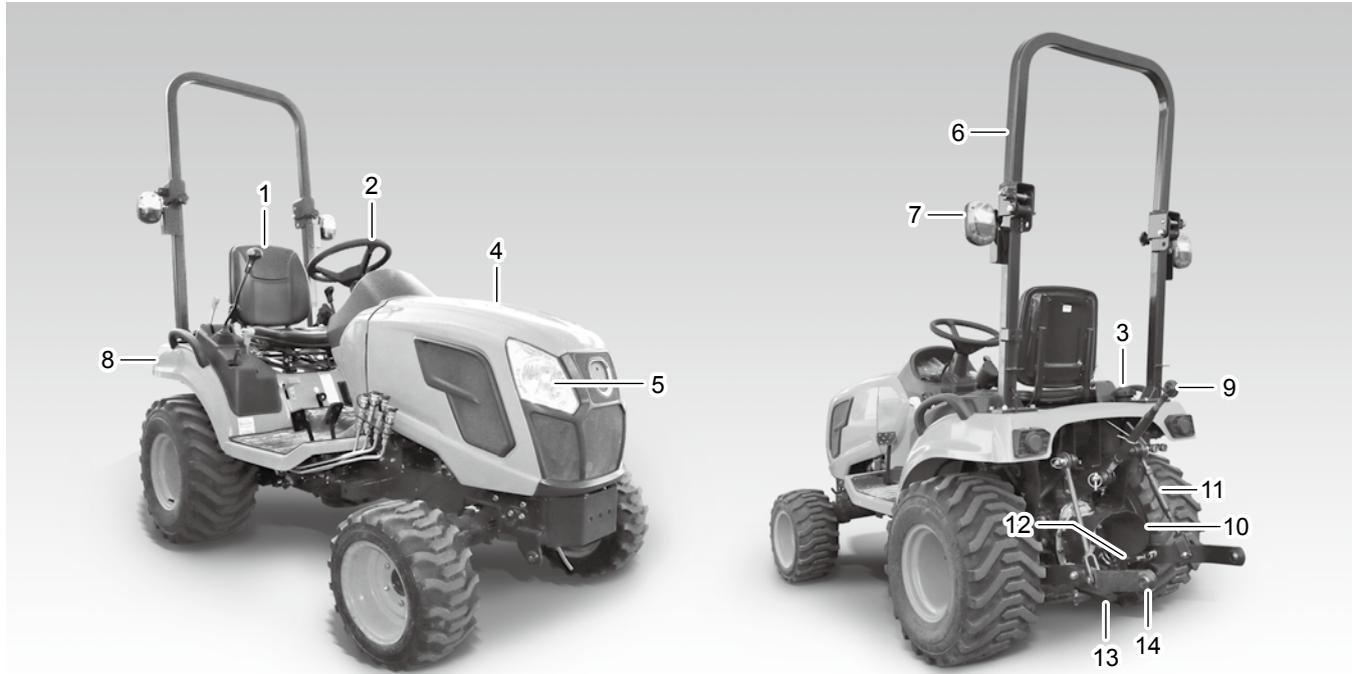
DESCRIPTION OF OPERATING SYSTEM

INFLATION PRESSURE..... 4-28
 TREAD 4-29
 WHEEL TORQUE AND DIRECTION 4-29
 ADDITIONAL WEIGHT (OPTIONAL) 4-30





EXTERIOR VIEW



- (1) Seat
- (2) Steering Wheel
- (3) Fuel Tank Cap
- (4) Bonnet

- (5) Head Lamp
- (6) ROPS
- (7) Combination Lamp
- (8) Fender

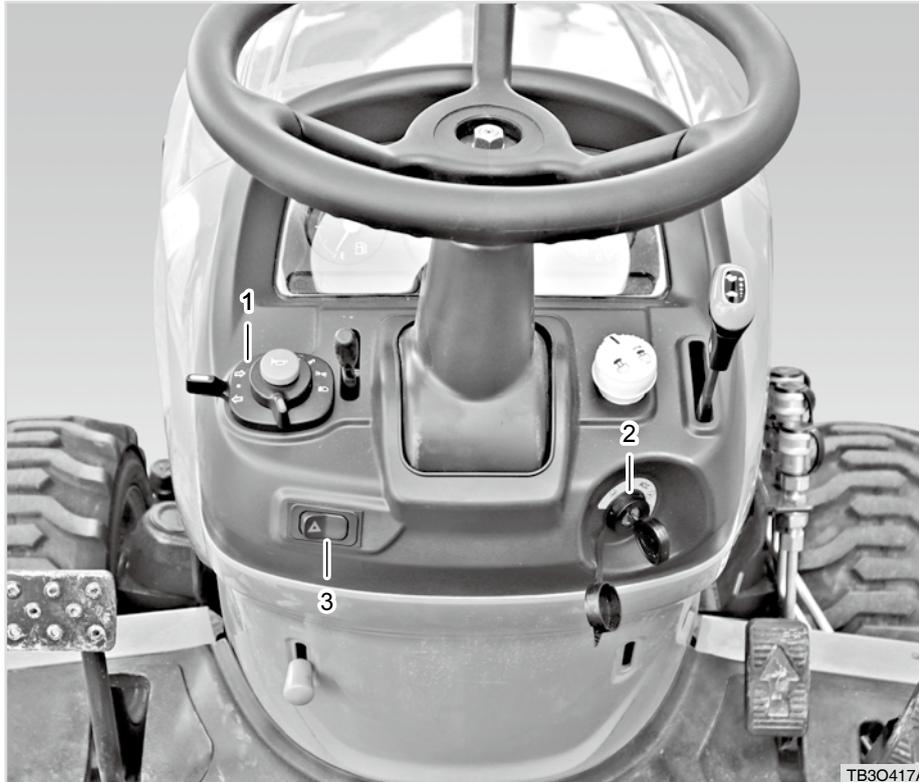
- (9) Top Link
- (10) P.T.O Shaft Cover
- (11) Crank Lifting Rod
- (12) Check Link

- (13) Draw Bar
- (14) Lower Link

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MOUNTING LOCATION



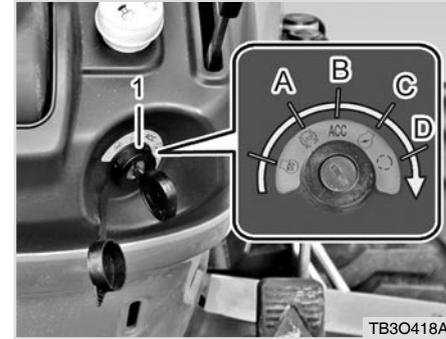
TB30417A

(1) Combination Switch

(2) Key Switch

(3) Hazard Lamp Switch

KEY SWITCH



(1) Key Switch

(A) Stop (B) ACC
(C) ON (D) Start

-  (A)

When the key switch is in position "A", the engine and all electrical devices in the vehicle are turned off.

However flasher lights can be operated along with their indication lamps on the dash board.

- **ACC (B)**

When the key switch is turned to the position "B", flasher lights, horn, power socket, USB socket and 3rd function valve can be operated.

-  **(C)**

The position "C" indicates the "ON" position. As soon as the key switch is turned to this position, the oil pressure warning lamp and battery charge warning lamp comes on. (These turn off after the engine is started)

 **CAUTION**

Caution before starting Engine.

- 1. Under normal condition, warning lamp turns on about one second at the time of Key-On, and then turns off automatically.**
 - 2. In case of warning lamp flashing, confirm flashing pattern. Refer to the warning indications at the time of error detection.**
 - 3. Ensure to Key-Off at the time of error rectify procedure.**
 - 4. Key-On again to confirm the recovery after correcting error.**
- Do not operate Engine except in case of emergency.**

 **NOTE**

- The pre-heating operation will automatically be activated in this position "C" (ON). The automatic preheat operation is indicated by the glow plug indicator. Make sure to preheat the engine until the glow plug indicator goes off (approx. 6 seconds) in cold weather before turning key switch to start position.

- **CS2210**

Temp.	Pre-heating and indicating time
T > 40	0 sec
-15 < T < 40	6 sec
T < -15	10 sec

- **CS2510**

Temp.	Pre-heating and indicating time
T > 30	0 sec
-15 < T < 30	8 sec
T < -15	15 sec



• ○ (D)

The position "D" indicates "Start". As soon as the engine is started, release the key then the key will return to the position "C".

⊕ IMPORTANT

- To start the engine, place the range shift lever in the neutral position and PTO lever in the OFF position. Then, sit on the seat and turn the key switch to the START position.

📖 NOTE

Dashboard welcoming ceremony;

- When the engine is started, the backlight of the instrument cluster comes on. Also, the pointer on the tachometer moves from 0 to the full position and then indicates the idling state. This is not an electrical problem, but it is called "dashboard welcoming ceremony".

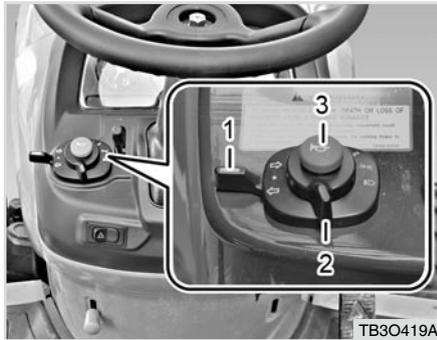
⚠ CAUTION

- Stop the engine immediately if the oil pressure warning lamp does not go off after the engine is started. The engine may be severely damaged.
- If the battery charge warning lamp does not go off after the engine is started, check the electrical systems, such as the alternator, for damage. Continuing to use the engine under this condition can discharge the battery or damage other electrical devices.

📖 NOTE

- The ignition key is not directional and can be inserted in any direction. Also, be careful not to leave the tractor unattended as the same key is used for all **KIOTI** tractors. It can be stolen.
- The horn and hazard lamp can be operated without the key inserted.

COMBINATION SWITCH

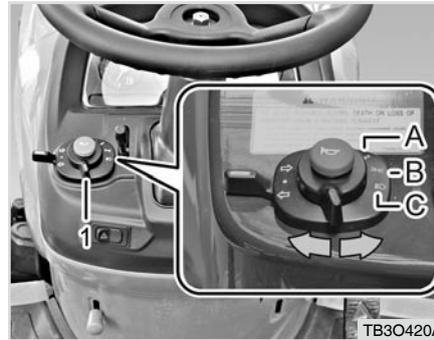


- (1) Turn Signal Light Switch
 (2) Head Light Switch
 (3) Horn Switch

The combination switch consists of the head light, turn signal light, and horn switches. Its function by its position is as follows:

- OFF : Head light and tail light "OFF"
-  : Head light "OFF" and tail light "ON"
-  : Low beam and tail light "ON"

HEAD LIGHT SWITCH



- (1) Head Light Switch
 (A) "OFF" (B)  (C) 

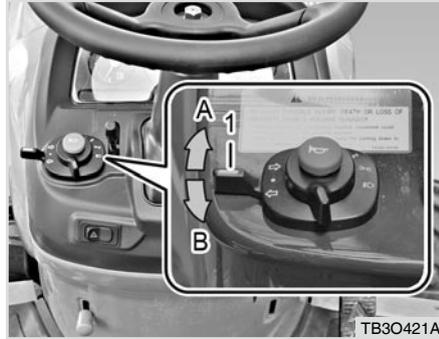
The head light switch can be operated only while the key switch is turned to the "ON" position. Turning the head light switch clockwise one click will turn tail lights on while turning it one more click will illuminate the low beam head lights and tail lights.

 **WARNING**

- *Driving with high beam head light disturbs an approaching vehicle's visibility for safe driving. Use the high beam head lights only if necessary.*



TURN SIGNAL LIGHT SWITCH



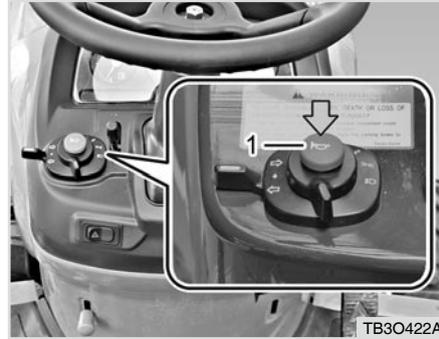
(1) Turn Signal Light Switch
(A) Right Turn (B) Left Turn

The turn signal lights are used when turning the vehicle left or right. Pulling the lever up blinks the right turn signal light while pushing the lever down blinks the left turn signal light.

NOTE

- The turn signal light lever is not the self-return type. Therefore, make sure to return the lever manually after turning the vehicle.
- The turn signal lamps can be operated without the key inserted.

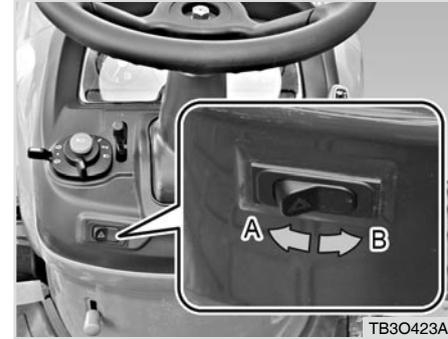
HORN SWITCH



(1) Horn Switch

The horn switch can be operated without the key inserted. Pressing this switch sounds the horn.

HAZARD LAMP SWITCH

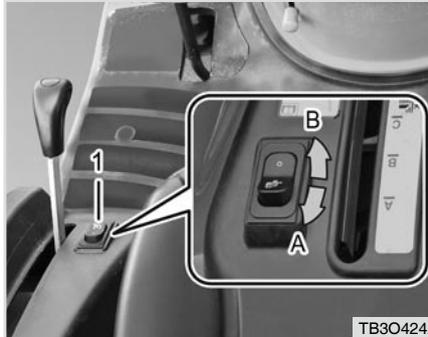


(1) Hazard Lamp Switch
(A) ON (B) OFF

This switch can be used to warn other vehicles when malfunction occurs in the tractor while driving on a public road. Pressing this switch blinks the hazard lamp and returning it turns off the lamp. The turn signal lights can be operated while this switch is pressed to operate the hazard lamps.

⚠ CAUTION

- If the hazard lamps are turned on for an extended period of time while the engine is stopped, the battery can be discharged. Therefore, use them only in emergency.
- The hazard lamp can be operated without the key inserted.

**CRUISE OPERATION SWITCH
(OPTIONAL)**

(1) Cruise Operation Switch
(A) ON (B) OFF

⚠ WARNING

- *Never use the cruise control function on a public or bumpy road or during turning.*

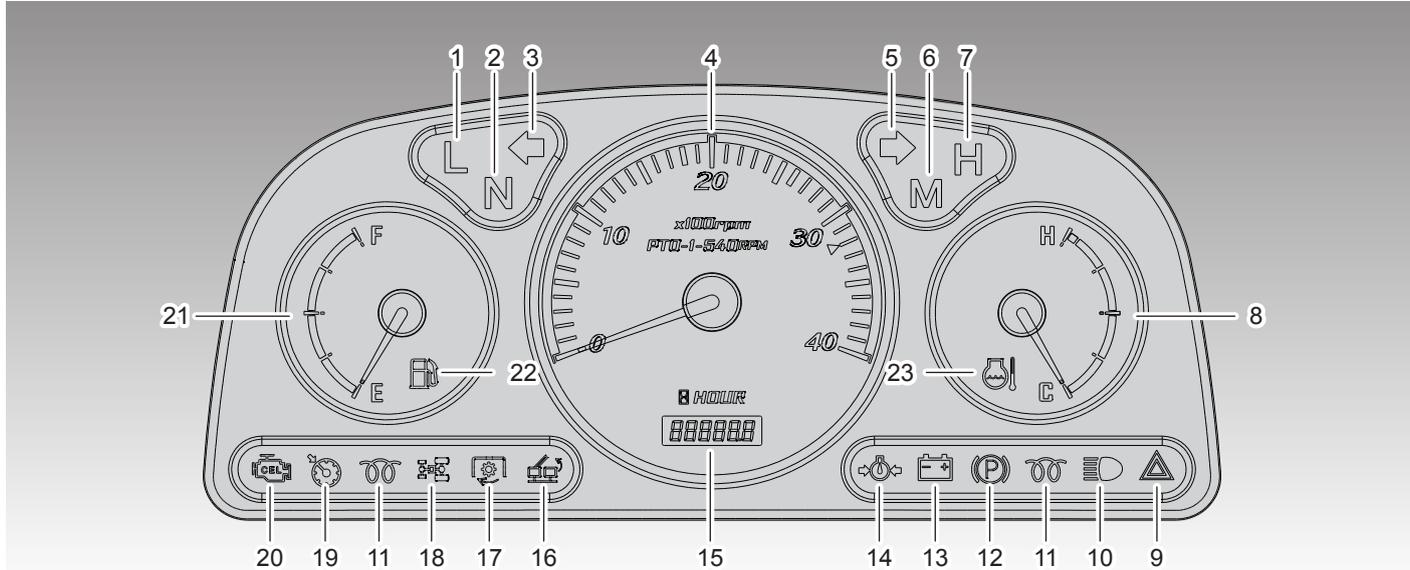
To activate the cruise control function, set the desired speed and press the switch to the “ON” position.

Depress the HST pedal to increase the driving speed in order to accelerate at a constant speed. To deactivate the cruise function, depress the brake pedal or press the switch to the “OFF” position.

The cruise function is not activated during reverse.

INSTRUMENT PANEL VIEW

Symbols on the instrument panel come on when the key switch is turned to the "ON" position.



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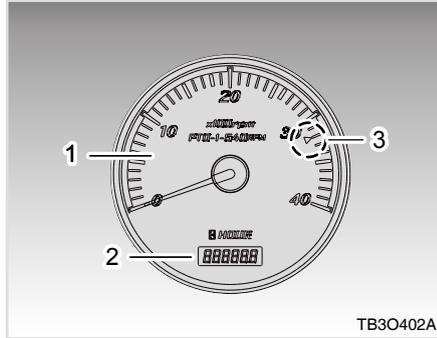
- (1) Low Speed Indicator
- (2) Neutral Indicator
- (3) Turn Signal Light (LH)
- (4) Tachometer
- (5) Turn Signal Light (RH)
- (6) Mid Speed Indicator

- (7) High Speed Indicator
- (8) Coolant Temperature Gauge
- (9) Hazard Lamp
- (10) High Beam Indicator
- (11) Glow Plug Indicator
- (12) Parking Brake Indicator

- (13) Battery Charge Warning Lamp
- (14) Engine Oil Pressure Warning Lamp
- (15) Hour Meter
- (16) Brake (One Side) Lamp
- (17) P.T.O Indicator
- (18) 4WD Engaged Indicator

- (19) Cruise Indicator
- (20) Engine Check Warning Lamp
- (21) Fuel Gauge
- (22) Low Fuel Level Warning Lamp
- (23) Engine Overheat Warning Lamp

TACHOMETER/HOUR METER INDICATOR

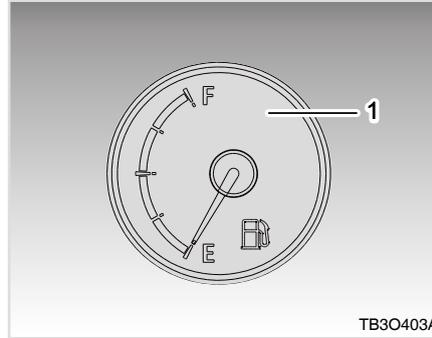


- (1) Tachometer
 (2) Hour Meter Indicator
 (3) Rated Engine Speed

It indicates the engine rpm that can drive 540 rpm of P.T.O speed. For speedy and effective work, adjust the work load so that the engine rpm is close to this mark "▲".

The hour meter does not operate if the engine is stopped even though the key switch is in the "ON" position.

FUEL GAUGE



- (1) Fuel Gauge
 "E" : Empty "F" : Full

This indicates the remaining fuel level after the key switch is turned to the "ON" position.

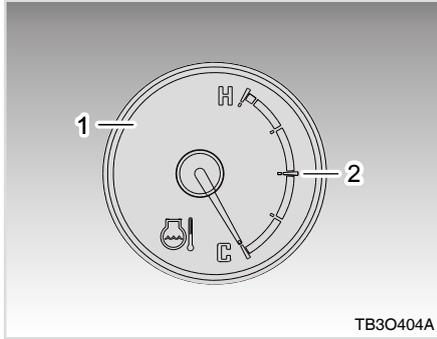
- **F** : Fuel is fully filled.
- **E** : Replenish the fuel tank.

If driving is continued with the needle below the position "E", air may enter the fuel supply system. In this case, "bleed" the system. (For detailed instructions, refer to "Bleeding fuel system" in the chapter "Service")

NOTE

- Make sure to use only correct fuel as the engine can be damaged if unqualified fuel is used.
- Use fuel for winter season in cold weather to start the engine easier.
- The gauge needle can move on a hill or curve as fuel slopes in the tank.

ENGINE COOLANT TEMPERATURE GAUGE



TB3O404A

- (1) Coolant Temperature Gauge
- (2) Normal Driving Range
- "C" : Cold
- "H" : Hot

This gauge indicates the coolant temperature after the key switch is turned to the "ON" position.

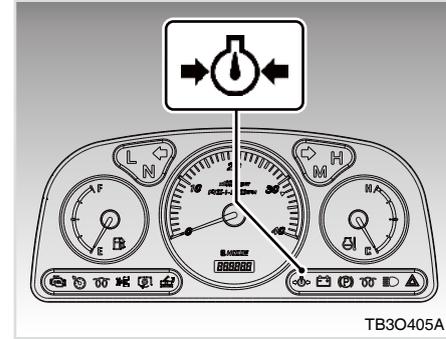
- **C** : Coolant is cold.
- **H** : Coolant is hot.

The range marked in "2" in the figure indicates the normal engine temperature. (Normal driving range)

⚠ CAUTION

- **Make sure to control the work load so that the needle is not in the red zone.**
- **If the needle stays in the red zone, do not stop the engine immediately. Instead, reduce the work load to cool down the engine before stopping the engine.**
- **Make sure to keep the front grill clean so that air is sucked through it freely for fast cooling.**

ENGINE OIL PRESSURE WARNING LAMP



TB3O405A

This lamp comes on when the engine oil pressure or oil level is low.

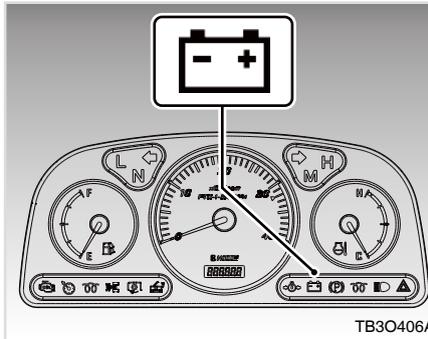
This lamp is turned On when the starting switch is turned On before starting the engine but turned Off after starting the engine. If this lamp comes with buzzer on while driving, stop the engine immediately and check the engine oil level.

If this lamp comes on even with the specified engine oil level, have the tractor checked by your local **KIOTI** dealer or workshop immediately.

⚠ CAUTION

- If the oil level is below the specified range, the engine can seize.
- The engine can be severely damaged if driving or operating the tractor with the engine oil warning lamp "ON".
- The engine may be stopped for approx. 185 seconds for its protection if the oil pressure is excessively low during driving.

BATTERY CHARGING LAMP

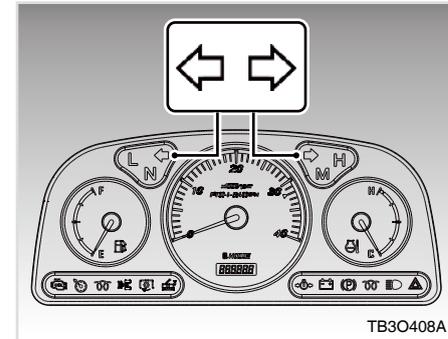


This lamp is turned On when the starting switch is turned On before starting the engine, but turned Off after starting the engine.

⚠ CAUTION

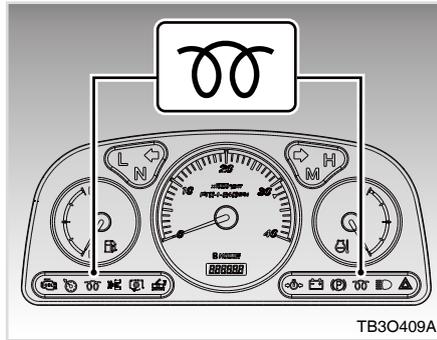
- If this warning lamp comes on while driving, the charging system, such as the alternator, is malfunctioning. Therefore, turn off all electrical devices and have the tractor checked by your local KIOTI Dealer or workshop as soon as possible.

TURN SIGNAL LAMP



Operating the turn signal lamp switch turns on the corresponding lamp in green.

GLOW PLUG INDICATOR

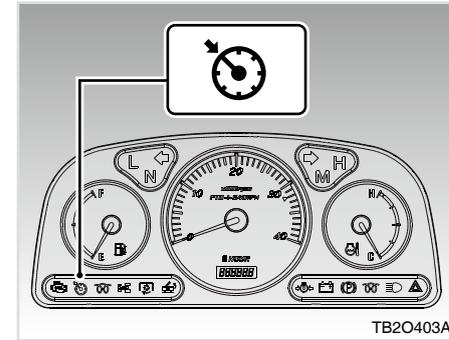


This indicates the operating condition of the preheat system. When the key switch is turned to the "ON" position, this indicator comes on for approx. 6 seconds. It is recommended to start the engine as soon as this indicator goes off for best starting performance. This indicator may not turn on if the engine is warm. In this case, the engine can be started without the preheat operation.

NOTE

- The illumination time of the pre-heat indicator is different by the coolant temperature. When the coolant temperature is below -15 degrees, it is turned on for approx. 6 seconds.

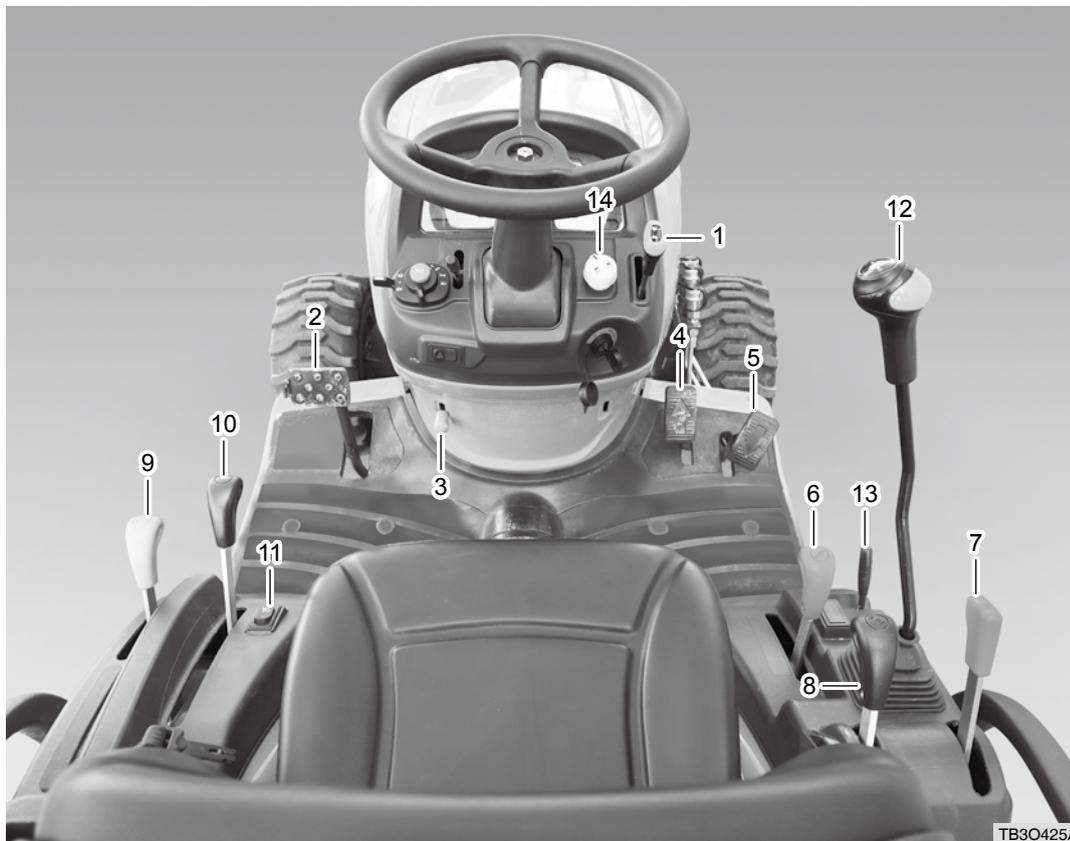
CRUISE LAMP (OPTIONAL)



1. Operating condition
Turn on the cruise switch during driving. Then, the cruise lamp comes on.
2. Deactivation condition
When pressing the brake pedal, turning off the cruise switch, the cruise lamp goes off.

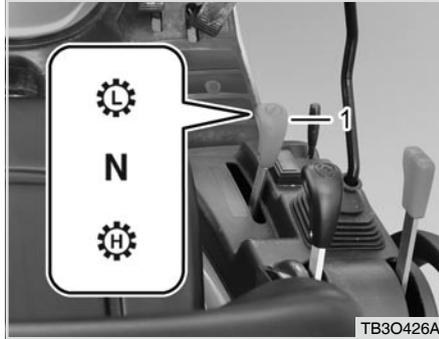


OPERATING THE CONTROLS



- (1) Hand Throttle Lever
- (2) Brake Pedal
- (3) Parking Brake Lock Lever
- (4) HST Forward Pedal
- (5) HST Reverse Pedal
- (6) Range Gear Shift Lever
- (7) Double Acting Lever (A,B)
- (8) Lift Position Control Lever
- (9) PTO Select Lever
- (10) Mower Deck Lever
- (11) Cruise Control Switch
- (12) Joystick Lever
- (13) Joystick Lock Lever
- (14) PTO ON/OFF Switch

HST RANGE GEAR SHIFT LEVER



(1) HST Range Shift Lever
 (⚙️) High Speed (⚙️) Low Speed
 (N) Neutral

High and low speeds can be selected by the HST range shift lever.

Follow the instruction below if a problem occurs during shifting this lever:

1. Put the range shift lever into the neutral position.
2. Depress the pedal slightly to prevent the gears in the transmission from rotating.
3. Shift the range shift lever into the desired position with the brake pedal and front/rear driving pedals depressed.

⚠️ CAUTION

- Never put the range shift lever into the high speed position during driving backward as it is dangerous to drive at a high speed.
- Reduce the speed before moving this lever since it is very dangerous to switch the driving direction at a high speed.
- Make sure to shift the range gear shift lever to neutral before engine starting because there is safety function for safety starting.

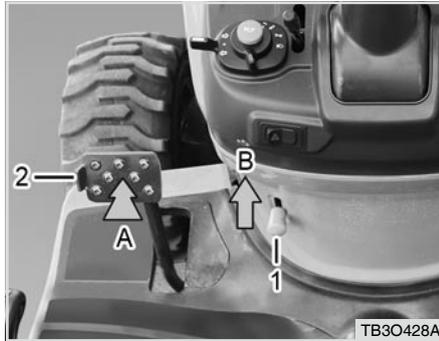
BRAKE PEDAL



(1) Brake Pedal

1. The brake pedal is located on the left side of the tractor and it is to control braking of the rear wheels.
2. For this tractor, the left and right brake pedals are not separated.

PARKING BRAKE LEVER



(1) Parking Brake Lever (2) Brake Pedal
(A) Depressing (B) Pressing Up

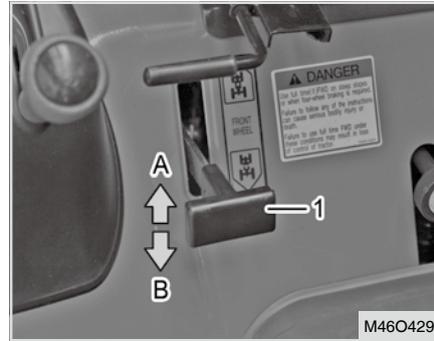
To stop the tractor, depress the brake pedal and pull the lever up to apply the parking brake.

The parking brake is automatically released by depressing and then releasing the brake pedal.

⚠ CAUTION

- If the vehicle is driven with the parking brake partially or completely engaged, it may cause early wear of the brake disc.

FRONT WHEEL DRIVE LEVER



(1) Front Wheel Drive Lever (4WD)
(A) "ON" (B) "OFF"

Using the 4WD is the best way to increase the vehicle traction. Pull the 4WD lever down to engage, push to disengage.

The 4WD function can be used under the following conditions:

1. If high traction is needed in a humid area.
2. When towing a trailer or using a loader.
3. When working on a sandy surface.

4. When the tractor is pushed out by reaction from the implement during cultivating on a hard surface.

5. When cultivating a field or driving over a bank.

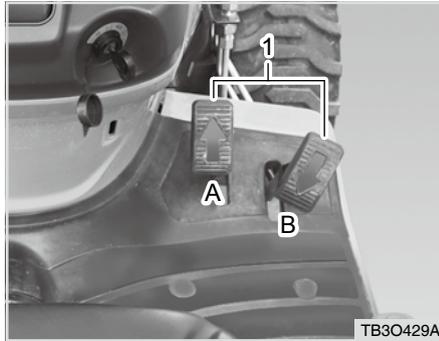
Be sure to full stop the tractor before engaging or disengaging the 4WD.

⚠ CAUTION

To avoid accident:

- Engage only when the vehicle is stationary.
- While the 4WD is engaged, drive the vehicle with low speed as steering and braking characteristics may differ.
- The 4WD should not be used on a paved road as tires can be worn faster.

FORWARD/REVERSE DRIVING PEDALS



(1) Forward/Reverse Driving Pedals
 (A) Forward (B) Reverse

Left pedal is for forward driving and right pedal is for reverse driving.

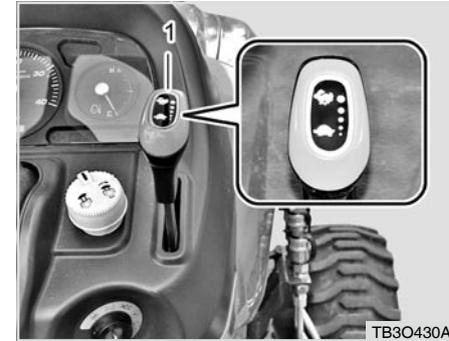
⊕ IMPORTANT

- "Unlike a gas pedal, these forward/reverse driving pedals act like a main speed shift in a mechanical tractor." Therefore, depress them deeper to obtain higher speed with lower torque and release them to obtain lower speed with higher torque.

⊕ IMPORTANT

- For heavy load job, such as front end loader operation, use low speed of the range shift lever.

HAND THROTTLE LEVER



(1) Hand Throttle Lever
 ↵ Decrease ↶ Increase

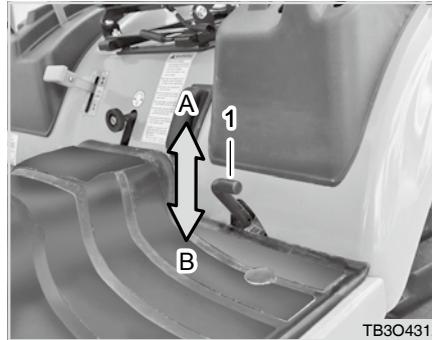
The hand throttle lever is to control the engine rpm. The engine accelerates to its full speed by pulling the hand throttle lever (↶ position) completely out while pushing the lever (↵ position) decelerates the engine.

The hand throttle lever is mainly used while working in a field.

DIFFERENTIAL LOCK PEDAL

⚠ CAUTION

- Using the accelerator lever during driving can lead to an accident as it becomes hard to decelerate the tractor rapidly.



- (1) Lock pedal
 (A) Release to "Disengage"
 (B) Depress to "Engage"

The differential lock is to secure the differential system and keep the wheel rotation on both sides the same in order to enhance the traction of the rear axle.

Depressing the pedal engages the differential lock while releasing the pedal disengages the differential lock.

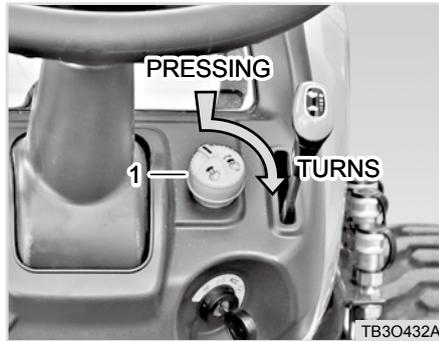
Use this system under the following conditions:

1. When any wheel slips and the tractor does not move in the field.
2. When it is hard to escape a soft or muddy field.

⚠ CAUTION

- The differential lock should be engaged only while the driving clutch is engaged. If the differential lock pedal does not move when depressing it, try to depress it again after releasing it.
- When engaging the differential lock, reduce the engine speed. After engaging it, accelerate the tractor.
- Make sure to set the steering wheel in the straight ahead position while the differential lock is in use. Otherwise, the differential system can be damaged.

PTO SWITCH (ON / OFF)



(1) PTO Switch

The PTO switch is used to supply power from the tractor to the implement.

Make sure to put this switch into the “OFF” position before starting the engine. Otherwise, the engine cannot be started.

To activate the PTO, press and turn the switch clockwise. To deactivate it, press the switch once.

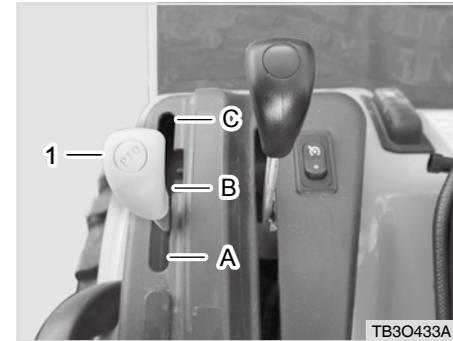
⚠ CAUTION

To avoid personal injury and accident:

- Before disassembling or cleaning the PTO system, make sure that the PTO switch is in the “OFF” position, the engine is stopped, and all parts are stopped.
- Always keep the PTO driving part clean. Also, check the PTO cover is closed while PTO is in operation.
- Disengage the PTO while driving the tractor on the public road.
- Be careful not to get your hand, foot, cloth, or hair into any driving part while the PTO is in operation. You can be severely injured.

Make sure that no one is around the tractor and implement while the PTO is in operation.

PTO SHIFT LEVER



(1) PTO Shift Lever

This lever is to shift the PTO speed as follows:

- Rear position (A): Connecting only to rear PTO
- Middle position (B): Connecting rear and middle PTO
- Front position (C): Connecting only to middle PTO

CUTTING HEIGHT ADJUSTMENT LEVER



(1) Cutting Height Adjustment Lever

Cutting height is controlled by the height adjustment control lever. The cutting height can be set to seven different heights.

⊕ IMPORTANT

- Deck must be in the "full up" position before cutting height can be changed. Do Not attempt to change cutting height with deck in any other position than "full up".
- When gauge wheels are properly adjusted, gauge wheels will not contact the ground! Gauge wheels are not meant to continuously contact the ground, the wheels act as anti scalp rollers on the four corners of the deck.

Gauge wheels must be adjusted according to the cutting height setting. Use the following chart for gauge wheel position.

CUTTING HEIGHT POSITION (On control lever)	FRONT and REAR GAUGE WHEEL HEIGHT (ground to center of wheel)
1.0"	2.60 in. (66 mm)
1.5"	3.07 in. (78 mm)
2.0"	3.58 in. (91 mm)
2.5"	4.09 in. (104 mm)
3.0"	3.82 in. (97 mm)
3.5"	4.29 in. (109 mm)
4.0"	4.02 in. (102 mm)

SEAT ADJUSTMENT SEAT SLIDING



(1) Seat Adjustment Lever

To adjust the seat position, pull the lever (1) to left under the front of the seat, slide the seat to the desired position, and then release the lever.

Make sure that the seat is firmly fixed by moving it gently after adjustment.

⚠ CAUTION

- Do not put a hand between the seat and the slides when adjusting the seat position. You can get injured unexpectedly.

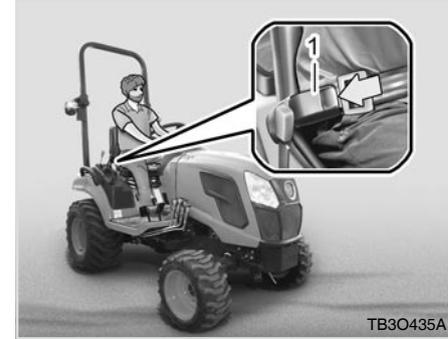
⊕ IMPORTANT

- The seat is equipped with a safety device that stops the engine when the driver's seat is not occupied.

⚠ WARNING

- *Never Leave the driver's seat while the engine running.*
- *Before leaving the seat, be sure to turn off any implements which are equipped with rotating blades such as rotary tiller, rotary cutter, mid/rear mower, snow blower, etc. and turn off the engine.*

SEAT BELT



(1) Seat Belt

The seat belt is self-retracting type. Make sure to fasten the seat belt before driving.

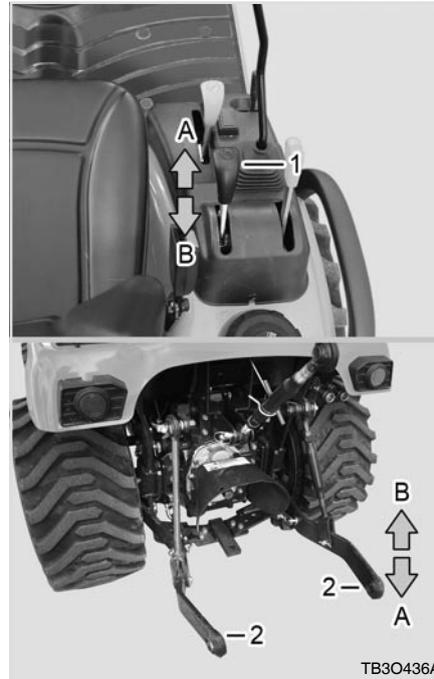
⚠ WARNING

- *Always fasten the seat belt when the tractor has ROPS properly. Otherwise, never wear the seat belt.*
- *Make sure that the seat belt is not twisted. It cannot work properly, leading to a dangerous situation.*

HYDRAULIC SYSTEM POSITION CONTROL LEVER

⚠ WARNING

- **Be extra careful not to let any part of your body under the tractor or an implement when lowering an implement.**



(1) Position Control Lever
(2) Lower Link
(A) Lowering

(B) Lifting

The position control lever is to operate the hydraulic lift arm to lift and lower a 3-point hitch implement.

To lower an implement, move the lever forward. To raise an implement, move the lever backward.

The position control lever is automatically returned to its neutral position when the lift arm reaches its upper limit position.

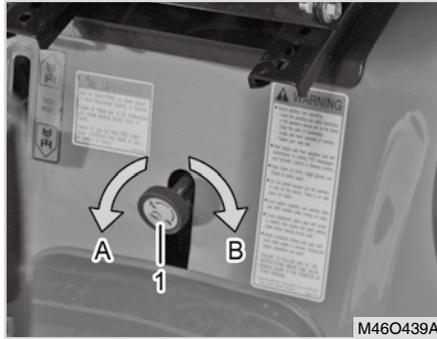
⊕ IMPORTANT

- **When lifting and lowering the lift arm, make sure to place the position control lever to the neutral position in order to stop the lift arm at the desired position.**

⚠ WARNING

- **Make sure that there is no one around before lowering an implement.**

LIFTING ARM (LOWER LINK) SPEED CONTROL LEVER



(1) Lowering speed control lever
 (A) High Speed (B) Low Speed

Turning the lever counterclockwise increases the lowering speed while turning it clockwise decreases the lowering speed. Also, turning it clockwise to its end can fix the implement to a certain position.

NOTE

- This lever does not control the lifting speed of the lifting arm.

JOYSTICK LEVER

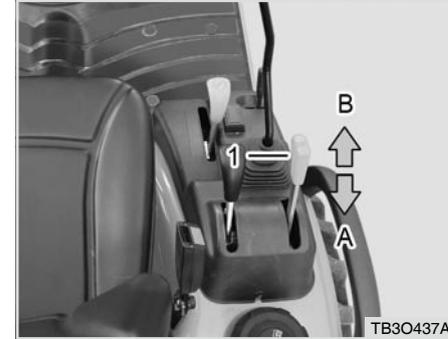


(1) Joystick Lever

This joystick lever is used mainly to operate the front end loader when attached to the tractor.

For detailed information, refer to "Handling Loader" in Chapter 6.

DOUBLE ACTING LEVER (OPTIONAL)



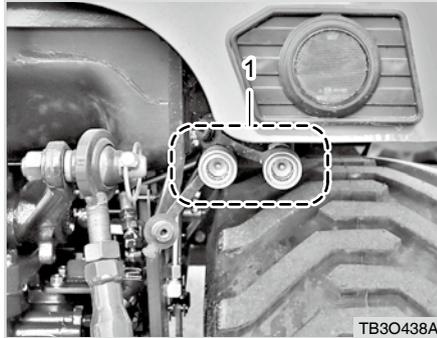
(1) Double Acting Lever
 (A) Port A (B) Port B

This lever is used to control a auxiliary hydraulic implement installed on rear.

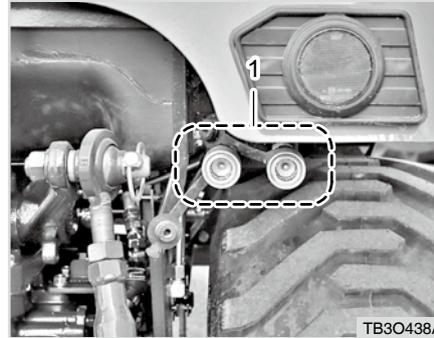
Lowering the lever supplies hydraulic fluid to Port B, while raising it supplies hydraulic fluid to Port A.

Pushing the lever supplies the port A with hydraulic pressure while pulling it supplies the port B with hydraulic pressure.

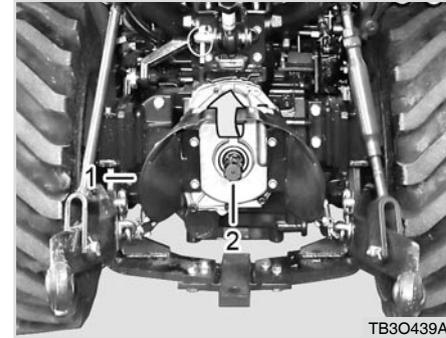
For detailed information, see "Operation" in Chapter 5.

**AUXILIARY PORT (OPTIONAL)**

(1) Quick Coupler



(1) Quick Coupler

PTO SHAFT COVER & CAP

(1) P.T.O Shaft Cover (2) P.T.O Shaft Cap

4

⚠ WARNING

- ***Put the detent valve operating lever into the neutral position when the hydraulic implement is not in use. If the detent valve is kept in the operating position for an extended period of time, the relief valve is kept open and the temperature of the hydraulic fluid rises, leading to damage of various hydraulic parts, such as the oil seals and O-rings.***

An Auxiliary valve can be installed to the tractor optional and a port can be attached to front or rear way according to option kit.

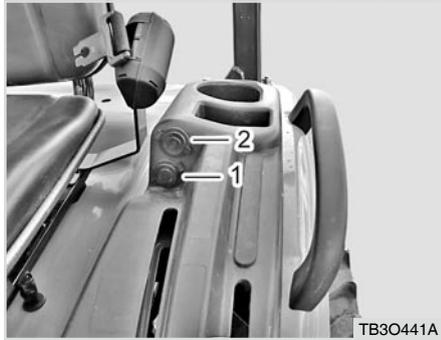
The auxiliary valve is installed to one of 3/8" quick couplers.

Use only the double mounting full type PTO cover.

The cover can be turned to the top to facilitate implement installation on the PTO spline shaft.

Make sure to install the PTO cap when the PTO is not in use.

ACCESSORY SYSTEM POWER SOCKET & USB CHARGE



(1) Power Socket
(2) Rechargeable USB Port

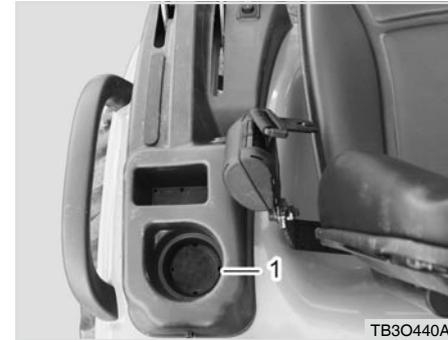
The power socket (1) can be used as a power source. It is operable only when the ignition switch is in the "ON" position.

An external device can be charged through the USB charging port (2) on the side.

⚠ CAUTION

- Always keep the cover closed when the device is not in use. If moisture enters, there is a risk of electric shock or damage to the device.

CUP HOLDER



(1) Cup Holder

The cup holder is installed to the left fender for driver's convenience.

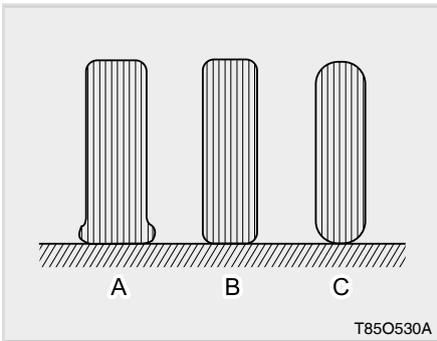
TIRES, WHEELS AND BALLAST

TOOL BOX



(1) Tool Box

The toolbox with latch cover is located in front of the vertical ROPS behind the seat.

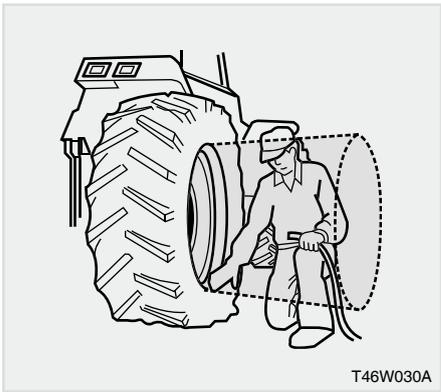


(A) Insufficient (B) Standard (C) Excessive

Though the tire pressure is factory-set to the prescribed level, it naturally drops slowly in the course of time. Thus, check it everyday and inflate as necessary.

⚠ WARNING

- Do not use tires larger or smaller than specified.
- Do not disassemble or assemble the tire. If it is necessary to disassemble/assemble the tire, let a qualified service person perform the work.



⚠ WARNING

- The tire rims can fall out of the tires. Therefore, stay out of their way when checking or inflating tires.

INFLATION PRESSURE

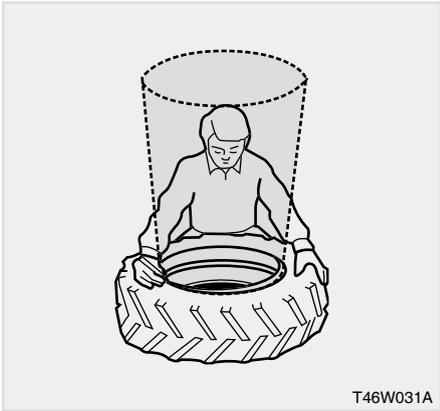
Always maintain the proper tire inflation pressure. Make sure the tire pressure does not exceed the pressure recommended in the manual.

Item		CS2220H(S)/CS2520H(S)	
		Tire sizes	Inflation pressure
Front	Farm	-	-
	Turf	18 x 8.5 - 8 R3	0.6~1.4 kg/cm ² , 60~140 Kpa, 8.7~20.3 psi
	IND	18 x 8.5 - 8 R4	0.6~1.4 kg/cm ² , 60~140 Kpa, 8.7~20.3 psi
Rear	Farm	-	-
	Turf	26 x 12.00 - 12 R3	0.8~1.4 kg/cm ² , 80~140 Kpa, 11.6~20.3 psi
	IND	26 x 12.00 - 12 R4	0.8~1.4 kg/cm ² , 80~140 Kpa, 11.6~20.3 psi

※ IND... for Industrial.

NOTE

- Keep the front tire pressure to maximum if maximum load is applied to the loader or front weight.
- If tires with a different size from the ones already in use are installed, contact the **KIOTI** dealer for the front/rear wheel speed ratio. Improper front/rear wheel speed ratio can result in excessive wear of the tires.



⚠ WARNING

- **Do not weld or apply heat to the tire rim or disc. The tire can explode due to the rapidly increased pressure in the tire.**
- **Check tires for inflation pressure, damage, deformation, and extended wear on lug and damage of rim and disc. Also check if wheel bolts, rim bolts, and nuts are loose.**

TREAD



(1) Wheel Bolt (2) Rim

As this tractor is integrated with the rim, the front and rear wheel treads cannot be adjusted.

**WHEEL TORQUE AND DIRECTION
WHEEL BOLT AND NUT TORQUE**

Front	88 N·m (8.97 kgf·m)
Rear	122 N·m (12.44 kgf·m)

⚠ WARNING

- **Use tires approved by KIOTI only.**
- **Assemble the tire as shown in the figure.**
- **Contact your local KIOTI Dealer if it is necessary to change the tire specification or installation method.**

ADDITIONAL WEIGHT (OPTIONAL) ADDITIONAL FRONT WEIGHT



(1) Additional Front Weight

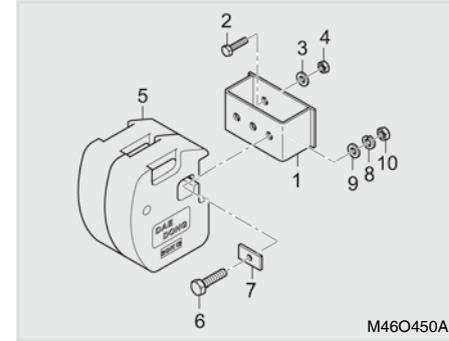
If the loader is not installed, attach a weight to the front frame of the tractor as a safety measure.

If a heavy implement is installed at the rear or when towing a heavy trailer, the front wheels may be lifted. Add sufficient weight to keep steer ability and to prevent rollover.

If sufficient weight, such as front loader, is applied to the front wheels, remove the extra front weight.

If the front tires are heavily loaded and it becomes hard to steer the tractor, the tires can be worn faster and the durability of the front axle can be deteriorated.

COMPONENTS FOR ADDITIONAL FRONT WEIGHT



- | | |
|---------------------------|-------------------|
| (1) Weight Bracket, Front | (6) Bolt |
| (2) Bolt | (7) Spacer |
| (3) Plain Washer | (8) Spring Washer |
| (4) Nut | (9) Plain Washer |
| (5) Balance Weight | (10) Nut |

When installing or removing a weight, always check the tire inflation pressure and adjust it as necessary.

The front weights are available at the **KIOTI** Dealer. For required number of weights, consult your local **KIOTI** Dealer.

Max. load

30 kg x 1 Pieces (60 lbs)


CAUTION

- **Additional weight might be needed for transporting heavy implements.**
- **Reduce the speed regardless of additional weight when driving on a bumpy or rough road with the implement lifted. The tractor can roll over.**


IMPORTANT

- **Attach only required amount of weight.**
- **The life of the axle or wheel can be shortened.**

ADDITIONAL LIQUID TYPE WEIGHT

It is possible to inject water and calcium solution into the tire to use it as a ballast.


NOTE

- The liquid injection should be performed only by a qualified service personnel.
For detailed information, contact your local **KIOTI** Dealer.

If one liter of water is mixed with 0.4 kg of calcium, this liquid does not freeze down at -49 °F (-45 °C).

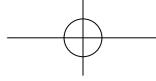
For a tire without a tube, fill it with water and calcium solution at least to the valve stem level (75%) with the valve stem.

If the tire without a tube is not filled with water and calcium solution sufficiently, a part of the ream is exposed, resulting in corrosion.

For a tire with a tube, fill it up to 90% of its level.


NOTE

- If the liquid ballast is used, inflate the tire 0.14 bar (2 psi) more than the specified pressure. This is to compensate for the ventilation symptom which occurs while the tire is moving.



MEMO





OPERATION

5

PRE-OPERATION 5-2

INITIAL OPERATION 5-3

OPERATING THE ENGINE 5-3

STARTING THE ENGINE 5-3

ENGINE CHECK LAMPS 5-7

STOPPING THE ENGINE 5-8

WARMING UP 5-9

JUMP STARTING THE ENGINE 5-10

OPERATING THE TRACTOR 5-11

DRIVING 5-11

FOLDING THE ROPS 5-13

RAISING THE ROPS TO UPRIGHT POSITION... 5-14

PARKING 5-15

TURNING 5-17

DRIVING ON SLOPE 5-17

CAUTIONS CONCERNING PAVED ROAD... 5-18

PRECAUTIONS WHILE DRIVING ON THE
ROAD 5-18

LOADING INTO AND UNLOADING OUT OF
THE TRUCK 5-19

POWER STEERING PRECAUTIONS 5-20

3-POINT HITCH CONTROL SYSTEM 5-22

EXTERIOR HYDRAULIC CONTROL SYS-
TEM (OPTIONAL) 5-23

5



PRE-OPERATION

It is a good practice to know the condition of your tractor before you start it. You should do a routine check before each use.

CAUTION

- **Stop the tractor on level ground, stop the engine, and apply the parking brake before checking or repairing it.**
Refer to “Daily inspection” in the section “Service” for fuel replenishment.
- **Read information titled as “Danger”, “Warning”, and “Caution” thoroughly for safe operation.**

CHECK ITEM

- Walk around inspection.
- Check the engine oil level.
- Check the transmission oil level.
- Check the coolant level.
- Clean the grill and radiator screen.
- Check the air cleaner filter.
- Check the brake pedal.
- Check all dash gauges and indicators.
- Check head lights, tail lights, and all working lights.
- Check accessible wiring harness for any damage.
- Check the seat belt and **ROPS** for damage.
- Check all danger and warning labels.
- Check fuel level.
- Check all danger and warning decals.
- Visually check tire inflation and wheel bolt tightening.

For detailed information, refer to “Maintenance interval” in chapter 7.



INITIAL OPERATION

Driving a new tractor at a high speed or load can damage its overall durability.

Make sure to run the tractor at the proper work load and speed for the initial operation of 10 to 20 hours.

SAFETY LOCK FUNCTION (WHILE VEHICLE IS STATIONARY)

1) The engine can be started only under the following conditions due to its safety lock function:

- The operator is on the seat.
- The range shift lever is in the neutral position.
- The PTO clutch is disengaged.

2) The tractor cannot be driven with the forward and reverse driving pedals depressed simultaneously while the engine is running.

In order to drive the tractor, first release the pedals. Then, the safety lock will be deactivated in approx. 0.5 seconds and the tractor is ready to drive.

TIPS FOR BREAKING-IN

1. Break in the vehicle within initial 50 hours of operation.
2. Start the engine and idle the engine at a low speed for 3 to 4 minutes in advance.
3. Increase the idling time in cold weather.
4. Do not drive the tractor at the maximum speed on a road.
5. Never apply excessive load during work.
6. Idle the engine at a low speed for 2 to 3 minutes before stopping it.

OPERATING THE ENGINE STARTING THE ENGINE

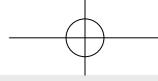
WARNING

To avoid accidents:

- **Be sure to read and understand the warning and caution decals on the tractor thoroughly.**
 - **Run the engine only in a well-ventilated area, or you can be suffocated by exhaust fumes.**
 - **Never start the engine unless you are on the driver's seat.**
- The tractor can abruptly start off, resulting in an injury or accident.***

IMPORTANT

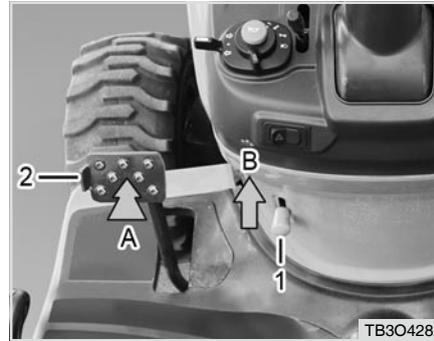
- **Using an additive so the engine will start more easily can damage the engine. And it will not be covered by warranty.**
- **Never try to start the engine for over 10 seconds consecutively to protect the start motor and battery from damage.**



⊕ IMPORTANT

Safety start system is applied:

- **Start condition (HST):** Operator on the seat + Pushing brake pedal. (HST pedal, Rear PTO and Mid PTO levers should be in neutral position)
- **Start condition (Mechanical):** Operator on the seat + Applying clutch pedal + Pushing brake pedal. (Shuttle lever, Rear PTO and Mid PTO levers should be in neutral position)
- **Operation continuance condition when operator leaves from the seat:** when parking brake in on and range shift and Mid PTO lever is in a neutral position. In any other condition, the tractor stops operation by it self in 3 sec of time delay.



(1) Parking Brake Lever (2) Brake Pedal
(A) Depressing (B) Pressing Up

1. Make sure there is no hazardous obstacle around the tractor.
2. Make sure the parking brake is set
 - (1) Depress the parking brake pedal and pull the lever up. (Check that the parking brake lamp on the gauge board illuminates)
 - (2) To release the parking brake press the brake pedals again.

⊕ IMPORTANT

- **Make sure that the brake pedals are fully depressed before pulling the parking brake lever up.**



(1) Range Shift Lever
(2) PTO Switch

3. Place the PTO switch to the “OFF” position. (It cannot be started engine while the PTO is engaged)
4. Set range shift lever in the neutral position.

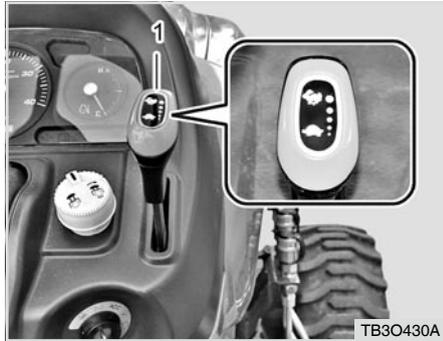


(1) Position Control Lever
(A) “Down”

5. Lower the attachment by pushing the position control lever forward.

⚠ WARNING

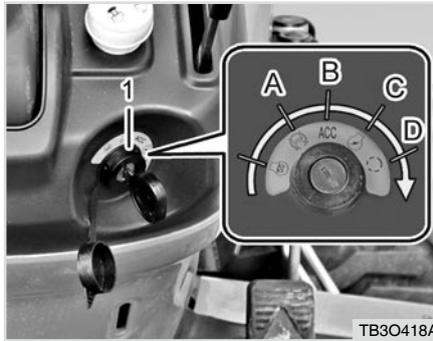
- ***Make sure that no one is around the implement or behind the tractor.***



(1) Hand Throttle Lever

"Increase" "Decrease"

6. Set the hand throttle lever into the neutral position.



(1) Key Switch

(A) Stop (B) ACC
(C) ON (D) Start

7. Insert the key into the key switch and turn it "ON" and maintain it until the preheat lamp is turned off.

While pre-heating, the pre-heat lamp on the dash board illuminates.

It is normal that the charge warning lamp and engine oil pressure warning lamps come on when the key is in "ON" position before the engine start.

NOTE

Operating principle of auto pre-heating system.

- The glow plug lamp comes on for 6 seconds and then goes off when the key switch is turned to the "Start" or "Stop" position.

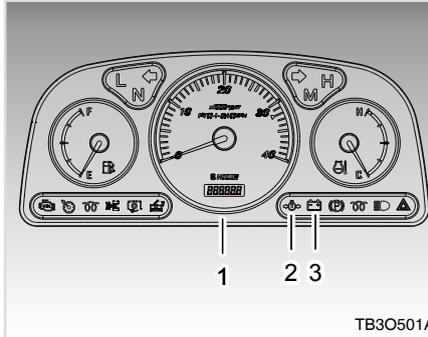
The engine should be started within 6 seconds after the glow plug lamp goes off. After the engine is started, post-heat is performed for 15 seconds with the key switch in the "ON" position.

- The after-heating is a function to keep the glow plugs activated for approx. 15 seconds after the engine is started in order to enhance the engine combustion performance and to reduce harmful emissions right after engine start.

**⚠ WARNING**

- **Never operate the start motor for more than 10 consecutive seconds as it consumes an excess of battery power. If the engine cannot be started within 10 seconds, wait for 30 seconds and try again.**
- **Never try to crank while the engine is running.**

8. When the engine is started, release the key. Then, the key is automatically turned back to the "ON" position.
9. Warm up the engine for 3 to 4 minutes (10 minutes in winter) after releasing the clutch pedal.



- (1) Instrument Panel
- (2) Engine Oil Pressure Warning Lamp
- (3) Charge Warning Lamp

10. Ensure that all the warning lamps on the instrument cluster are "OFF".

If any lamp remains on, immediately stop the engine and determine the cause.

ENGINE CHECK LAMPS

1. If the oil pressure warning lamp (2) does not go "OFF" in 4 to 5 seconds after the engine is properly started, stop the engine immediately and check the engine oil level. If the engine oil level is proper, contact your local **KIOTI Dealer**.

⚠ WARNING

- **The engine can be severely damaged if it is run with the oil pressure warning lamp "ON".**

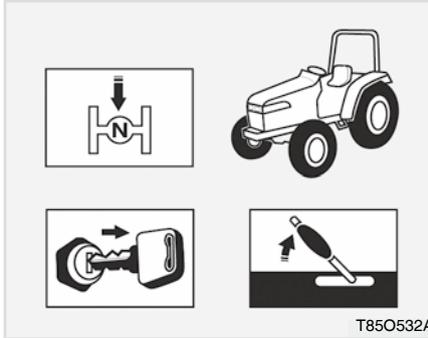
2. If the charge warning lamp (3) does not go "OFF" in 4 to 5 seconds after the engine is properly started, it means that the battery is not being charged. Have the charging system, such as the battery and alternator, serviced.
3. Refer to "Instrument panel" in chapter 4 for detailed information about other indicators and lamps.



STOPPING THE ENGINE

WARNING

- *If driving the tractor for an extended period of time with the charge warning lamp “ON”, the battery can be discharged and the tractor’s electrical system can be damaged.*



1. Make sure to reduce the engine rpm before stopping the engine.
2. Depress the clutch pedal and put all shift levers in the neutral position.
3. Run the engine at the idle speed for approx. 2 to 3 minutes, and then turn the key switch to the “OFF” position to stop the engine.

WARNING

- *Never touch the muffler or hot covers until they are cooled down after running the engine or driving the tractor.*

IMPORTANT

- Turn off all the electrical devices and remove the ignition key before leaving the tractor.
- The horn, turn signal lamp and hazard lamp can be operated without the key inserted. However, using these components without the engine started can discharge the battery.



WARMING UP

It is recommended always to warm up the engine before driving in order to maintain the durability of the engine and prevent malfunction of the engine. Before warming up the engine, make sure that each part in the engine is properly lubricated and each hydraulic part is in a perfect condition in order to prevent malfunction in the engine as well as the hydraulic system.

HOW TO WARM UP ENGINE

1. Start the engine and run it at a low speed and without load for approx. 3 to 4 minutes.
2. In cold weather, increase the warming up time to 10 minutes.
3. If it is very cold, warm up the engine for approx. 15 minutes.
4. The engine throttle can be open for 50 % in order to shorten the warming up time.
5. The engine is sufficiently warmed up when the temperature gauge on the instrument panel indicates 1/4 of the normal temperature range, regardless of the warming-up time.
6. Do not increase the work load rapidly after starting work.
7. Run the engine without load for approx. 2 to 3 minutes before stopping the engine after work.

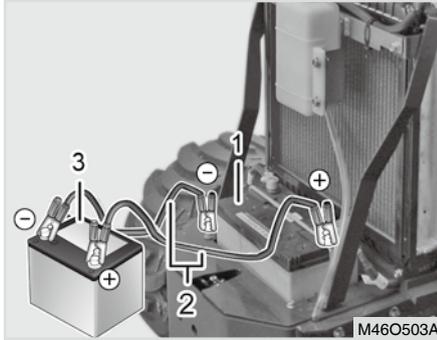
WARNING

- ***Warming up the engine excessively increases fuel consumption and affects the durability of the tractor negatively.***
- ***It can cause fire and an accident.***
- ***Never leave the tractor unattended while warming up.***

WARNING

- ***Be sure to apply parking brake while warming up the engine.***
- ***If the warm-up procedure is skipped, the tractor can take off abruptly to cause a fatal accident.***

JUMP STARTING THE ENGINE



(1) Dead Battery (2) Jumper Cables
(3) Helper Battery

If the battery is discharged and the engine cannot be started, it is possible to start the engine by connecting the discharged battery to a battery from another tractor or other extra battery.

1. Check that the voltage of the discharged battery is same as the voltage of the other tractor or vehicle for jump start. (Specification for this tractor: 12V)
2. Check the length of the jump cable and position another tractor near the tractor with the discharged battery. Then, put all the shift levers in the neutral position, apply the parking brake, and stop the engine.
3. Wear protective glasses and gloves and open the hoods of both tractors. Remove the battery terminal cover as necessary.
4. Connect the alligator clips on both ends of the red positive cable to the positive terminals of both batteries.
5. Connect one clip of the black negative cable to the negative terminal of the normal battery and the other clip to the tractor body with the discharged battery. Make sure to connect the clip to a part of the frame without paint.
6. Start the engine of the tractor with the charged battery.
7. Start the engine of the tractor with the discharged battery.
8. Disconnect the black cable from the negative battery terminals of both of the tractors.
9. Disconnect the red cable.
10. Run the engine for at least 30 minutes to charge the discharged battery.
11. If the battery is discharged again, replace it or check the charging system, such as the alternator.



OPERATING THE TRACTOR DRIVING



(1) Seat
(2) Seat Adjustment Lever (Sliding)

1. Adjust the seat and fasten the seat belt.

⚠ WARNING

- Check if the seat is securely locked after the seat adjustment.
- Do not adjust the seat while driving. The seat may move suddenly causing the loss of control of the tractor.



(1) Seat Belt

2. Wear the seat belt.

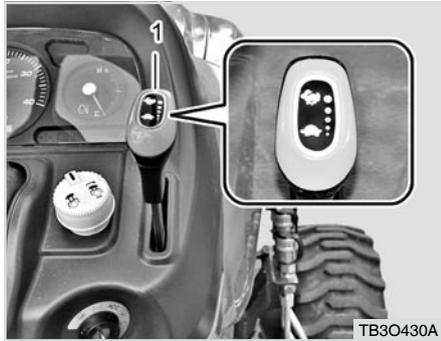
⚠ WARNING

- Always wear the seat belt.
- If the seat belt is worn across the abdomen or waist, not the hips, an injury can occur in case of an accident or impact.
- Do not wear the seat belt if the ROPS is not installed or folded.



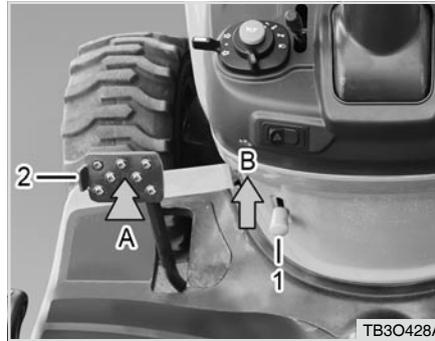
(1) Position Control Lever
(A) Lifting

3. Pull the position control lever backward to raise the attachment.



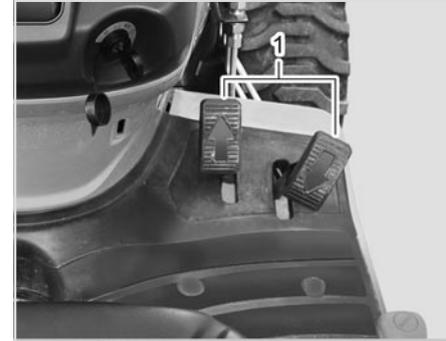
(1) Hand Throttle Lever
➔ Decrease ➔ Increase

4. Increase slowly the engine RPM from idle speed to medium speed.



(1) Parking Brake (2) Brake Pedal
(A) Depressing (B) Pressing Down

5. Release the parking brake. (Depress the brake pedal lightly to release)



(1) Forward / Reverse Driving Pedals
(2) Range Shift Lever



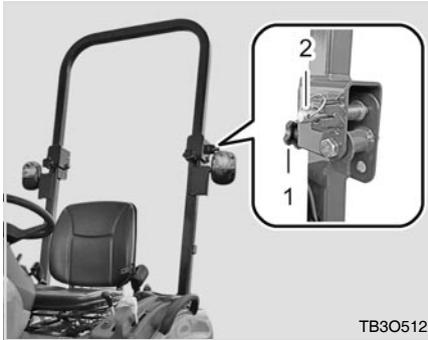


6. Shift the range shift lever and depress the forward/reverse driving pedal to move the tractor.

 **CAUTION**

- Do not change the tractor speed abruptly for safe driving.
- When driving on a slope or loading or unloading the tractor to a transporting vehicle, reduce the speed in advance so that there is no need to shift the gear in the middle of the slope. Also, do not put your hand on the shift lever while driving on a slope. The tractor could roll down the slope.

FOLDING THE ROPS



(1) Grip Bolt

(2) Set Pin

1. Pull the set pin forward.

 **CAUTION**

- You should always stop the engine, remove the key and set the parking brake before raising or folding the ROPS.
- Always perform such tasks from a safe and stable position at the rear of the tractor.
- It is very dangerous to drive with the ROPS folded. Fold the ROPS only when there is absolutely no possibility for roll over. If the situation changes, unfold the ROPS immediately.



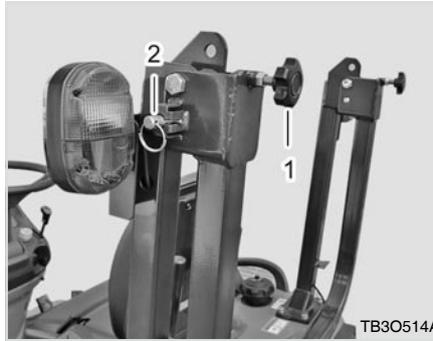
(1) ROPS

2. Fold the **ROPS**.

⚠ CAUTION

To avoid personal injury:

- Hold the **ROPS** tightly with both hands and fold the **ROPS** slowly and carefully.



(1) Grip Bolt

(2) Set Pin

3. Align it to the groove and pull the set pin to release it.

⚠ CAUTION

To avoid accidents:

- Make sure the pins are properly installed and secured.

RAISING THE ROPS TO UPRIGHT POSITION



1. Pull the set pin forward.

2. Raise **ROPS** to the upright position.



CAUTION

To avoid accidents:

- Make sure to set the ROPS upright and fasten the seat belt during work.

If it is necessary to work with it folded, do not fasten the seat belt.

It can be dangerous in case of tractor rollover.

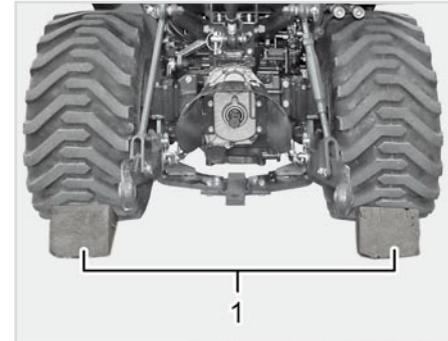


(1) Grip Bolt

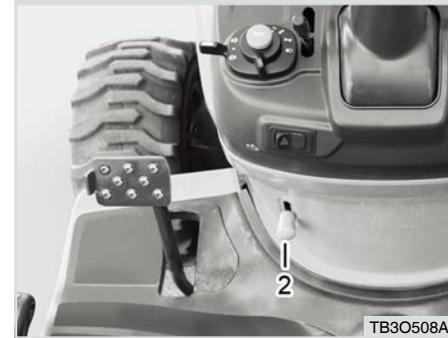
(2) Set Pin

3. Align it to the groove and pull the set pin to release it.
4. Fix the **ROPS** with the grip bolt.

PARKING



1



(1) Chocks

(2) Parking Brake Lever



1. This tractor is not equipped with a separate parking brake. However uses the brake pedals instead.
2. Pull the parking brake lever (2) up with the brake pedals depressed fully to engage the pedals with the latch. If the braking force is insufficient, depress the pedals more firmly.
3. Before leaving the tractor after parking it, make sure to stop the P.T.O lower the implement onto the ground, and stop the engine.
4. If it is necessary to leave the tractor with the engine running, put all the shift levers in the neutral position and apply the parking brake firmly.
5. When parking the tractor on a slope, stop the engine with the parking brake applied and engage the low speed gear. Also, put the shuttle shift lever into the forward driving position on an uphill and into the reverse driving position on a downhill.
6. If it is necessary to park the tractor on a slope with the engine running, chock all four wheels (1) and perform Steps 3 and 4 above.
7. In order to release the parking brake, depress the brake pedals firmly again.

⚠ WARNING

- *The brake disc can be rapidly worn if you drive with the parking brake applied.*
- *Never park the tractor on a steep slope in any circumstance. A severe accident can happen.*

⊕ IMPORTANT

- **The tractor may move slowly with the engine running even though the main and shuttle shift levers are in the neutral position. This is normal and is due to the fluid friction in the transmission. This symptom can easily occur when the engine rpm is high, the low speed gear is selected by the range shift lever, and the viscosity of the transmission fluid is high due to low temperature. To prevent this symptom, make sure to apply the parking brake.**
- **Get off the tractor after checking that the tractor is completely stopped and the parking brake is firmly applied. Do not park the tractor on tall grass or hay. If grass or hay touches the muffler, it can cause fire.**



TURNING

You should turn slowly by lowering the engine rotation if possible.

WARNING

To prevent accidents due to loss of steering control:

- ***If you turn at high speed, the tractor can turn over.***
- ***Never use the differential lock system turning at high and low speeds. A serious accident can occur.***

DRIVING ON SLOPE

1. Please drive according to the conditions of the slope at safe speed so that the engine is not under heavy load if possible.
2. Make sure to shift to the lower gear in order to prevent the engine from stalling on an uphill.
3. On the downhill slope, drive at low speed.

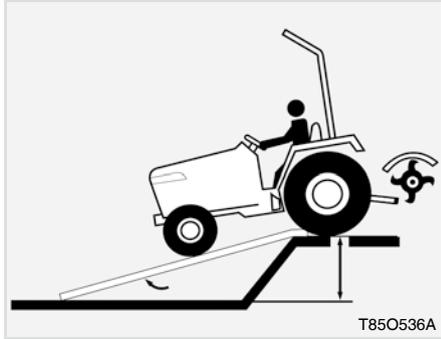
IMPORTANT

- **"Unlike a gas pedal, these HST pedals act like a main speed shift in a mechanical tractor". Therefore, depress them deeper to obtain higher speed with lower torque and release them to obtain lower speed with higher torque.**
- **For heavy load job, such as front end loader operation, use low or medium speed of the range shift lever.**

WARNING

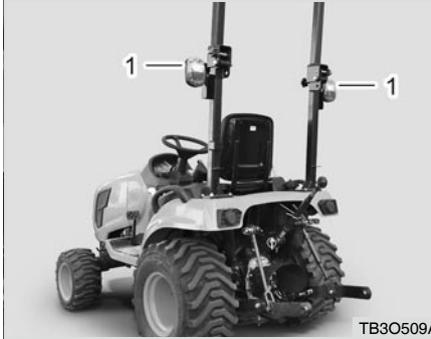
- ***Make sure that the coupling device of brake pedal and differential lock pedal are surely released.***
- ***Before entering a steep slope, move the shift lever down to a proper gear and never try to move the shift lever on a slope. A serious accident can occur.***

CAUTIONS CONCERNING PAVED ROAD



1. Make sure that the left and right pedals are connected.
2. Go in and out of the cultivated land at a right angle.
3. Enter and exit the field by driving the tractor at a right angle to the bank.
4. When going up, lower the implement not to let the front wheel rise. Raise the implement as soon as the front and rear wheels are over the bank.
5. It is recommended to use the 4WD and drive backward when moving onto a bank.

PRECAUTIONS WHILE DRIVING ON THE ROAD



(1) Direction Indicator

1. When you change the driving direction on the road, let other car know your direction by using the directional signals.
2. When you meet another car in the opposite direction in the night, let the light be directed to the ground so as it will not interrupt the other driver's view.



(1) Brake Pedal

⚠ WARNING

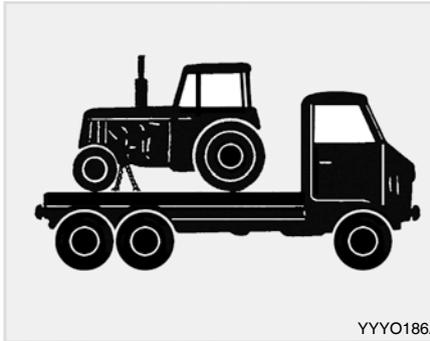
- **When you are driving on the road, observe all local traffic and safety regulations. If not, you can have an accident.**
- **Only the operator should ride on the tractor unless a passenger seat is installed.**



LOADING INTO AND UNLOADING OUT OF THE TRUCK

WARNING

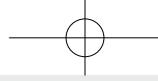
- *If the tractor breaks down while driving on the road, move it to a safe place to service. If not, it can cause personal injury.*



WARNING

- *When transporting the tractor with a truck, fix the tractor firmly onto the truck and be sure to aware the height of loaded tractor to avoid to hit the ceiling of the tunnel or the bottom of the bridge.*
- *Make sure to follow this instruction as such accidents really happen.*

1. When you load the tractor, do it by driving backward.
2. If the engine stalls out halfway, step on the brake pedal at once, and then take away the pedal slowly to reach the road. After that, start the engine again to go up.



POWER STEERING PRECAUTIONS



(1) Power Steering Handle

1. The power steering function is activated only while the engine is running. However, the steering wheel becomes slightly difficult when the engine is running at a low speed.
The steering wheel can be operated but becomes very difficult when the engine is stopped.
2. If you operate the steering wheel with the tractor loaded, using an implement or loader, the steering

wheel operation can be somewhat difficult. Operate the steering while tractor is in motion.

3. When a loader is mounted, adjust the air pressure of the front wheel to its maximum specification and mount weight or implement on the 3 point hitch of the tractor, and remove the front weight to make the front and rear balance more stable for safe working.
4. When turning the steering wheel to its end, the operating sound of the safety valve (relief valve) can be heard. Do not continuous to operate the steering wheel to a maximum right or left turn when you hear the relief valve continually. (OK for a short period of time). The temperature of the hydraulic fluid may rise, causing malfunctions.

NOTE

The power steering system in this tractor is a non-load reaction, full hydraulic type.

- The full hydraulic system means that power necessary for power steering is transferred by hydraulic fluid only and therefore mechanical devices, such as racks and pinions, are not installed to the tractor. This function prevents the steering wheel from returning to its original position by the resistance applied to the front wheels which are hydraulically, not mechanically, linked to the steering wheel. Therefore, the angle of the **KIOTI** emblem on the center of the steering wheel may differ occasionally, which is normal.

 **NOTE**

- The non-load reaction type means that the reaction force or impact applied to the front axle is not transferred to the steering wheel. Therefore, this function prevents the steering wheel from returning to its original position by the resistance applied to the front wheels when turning.
- These characteristics are suitable for tractors which are driven mostly at a low speed. The features low reaction force of the steering wheel can reduce the operator's fatigue during work in which frequent turning is required. However, it may be inconvenient when driving at a high speed as the steering wheel is not automatically returned to its straight-ahead position after turning.

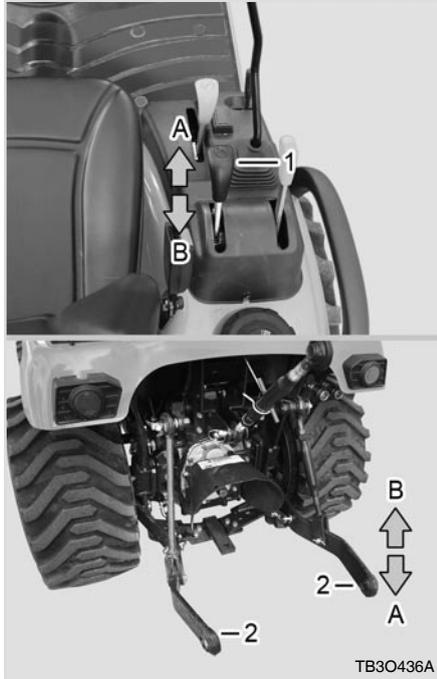
 **WARNING**

- *When driving on a road with an implement attached to the rear of the tractor, the traction of the front wheels becomes poor, resulting in poor steerability. In this case, attach a proper front weight and drive at a low speed.*
- *If malfunction occurs while driving on a road, stop the tractor in a safe place and service it. If it is not possible to move the tractor, set a warning triangle behind the tractor. Otherwise, a rear end accident may occur.*
- *The center of gravity of the tractor is higher compared to other common vehicles, so the possibility of a roll-over accident is very high. Be extra careful when driving on a lateral slope, bumpy road, road with puddles, and narrow road. Make sure to set the ROPS in its original position and fasten the seat belt.*

 **WARNING**

- *If stopping the engine while driving, the steering performance can become deteriorated due to loss of hydraulic power, resulting in a severe accident. Never stop the engine while driving.*
- *Do not release the steering wheel to return to the straight-ahead position after turning while driving. The steering wheel in this tractor is not a self-return type. Releasing the steering wheel while driving may lead to a massive accident.*

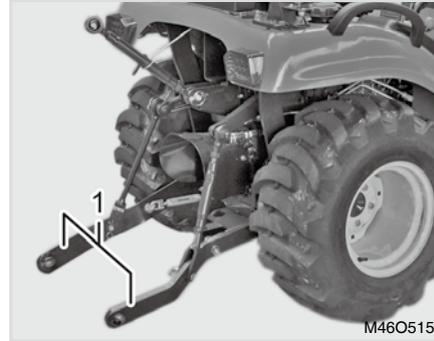
3-POINT HITCH CONTROL SYSTEM



(1) Position Control Lever (2) Lower Link
 (A) Lowering (B) Lifting

The 3-point hitch can be controlled by the position control lever. The lever installed on the center side (away from the driver) is the position control lever.

POSITION CONTROL



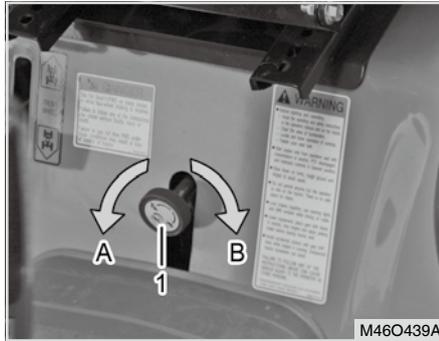
(1) Lower Link

1. The position control lever is used to lift or lower the lifting arm (lower link) of the 3-point hitch.
2. Pushing the lever forward lowers the lower link while pulling the lever backward lifts the lower link.
3. The lower link is lifted by the hydraulic energy of the tractor while it is lowered by potential energy of its own weight. Therefore, the implement cannot be lowered by the hydraulic pressure.

4. Therefore, the implement attached to the lower link may be lifted by protrusion on the ground when it is lowered to the ground. It is called "floating."



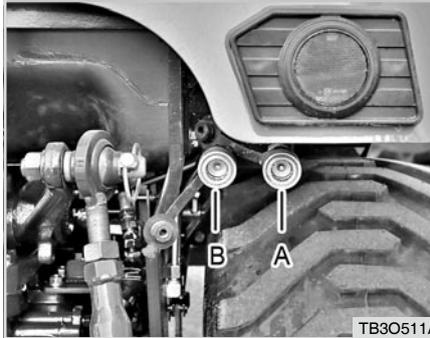
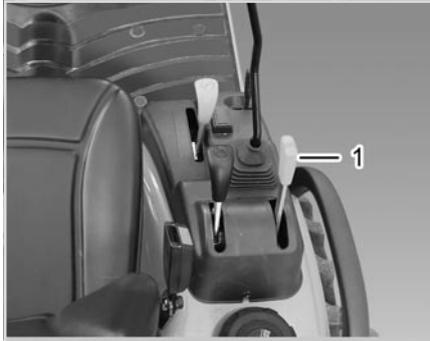
EXTERIOR HYDRAULIC CONTROL SYSTEM (OPTIONAL) DOUBLE ACTING VALVE LEVER



M46O439A

(1) Lowering Speed Control Lever
(A) High Speed (B) Low Speed

5. The lowering speed of the lower link is proportional to the applied weight but can be controlled by adjusting the draining passage of the hydraulic fluid. (See “Lifting arm speed control lever” on Page 4-31)



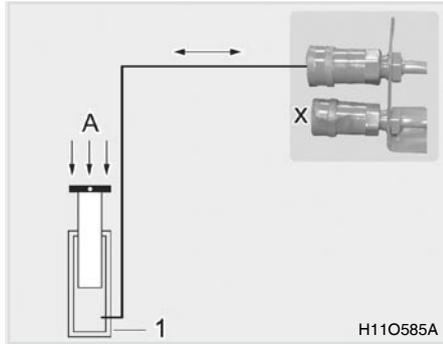
TB3O511A

(1) Double Acting Valve Lever (Self Return Type)
(A) Port A (B) Port B

KIOTI supplies self-return type of the double acting valves:

- For the self-return type double acting lever, it returns to its original position to block the hydraulic fluid when it is pushed/pulled and then released. However, this type of double acting valve lever should be pulled or pushed continuously for operation which is suitable for an implement with a short operating time, such as the hydraulic cylinder.

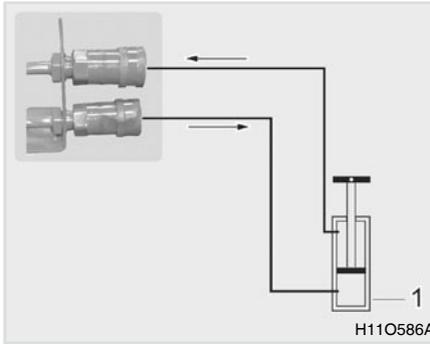
SINGLE ACTING AND DOUBLE ACTING CYLINDER



(1) Single Acting Cylinder
(A) External Load

This tractor is equipped with the remote control valve of the double acting type. However, this valve can also be used in the single acting type hydraulic cylinder.

1. Connect one end of the hydraulic port to the single acting cylinder as shown in the figure. The hydraulic pressure is properly supplied to the cylinder. However, when the hydraulic pressure is released, the cylinder is contracted only if there is outer force, such as potential energy.



(1) Double Acting Cylinder

2. To contract the cylinder, operate the lever to the opposite position of the expansion. Then, the hydraulic fluid is supplied from the hydraulic pump to the hydraulic port which is not connected, and the pressure rises as the port is blocked. However, this pressure is released as the relief valve opens.

3. When the cylinder is contracted, the hydraulic fluid returned from the cylinder is drained to the transmission through the draining circuit as the operating lever is operated to the opposite direction from the expansion position.

⊕ IMPORTANT

- It is recommended to use the double acting cylinder instead of the single acting cylinder if the implement will be operated frequently and continuously. If using the single acting cylinder too frequently or for an extended period of time, the hydraulic fluid can be overheated, resulting in deterioration of the hydraulic parts' durability as the main relief valve opens at cylinder contraction.



CONNECTING AND DISCONNECTING IMPLEMENT HYDRAULIC HOSE CONNECTION

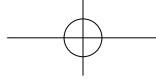
1. Make sure to stop the engine before connecting hydraulic hoses.
2. Move the double acting valve lever forward and backward for 4 to 5 times to release the pressure in the hydraulic line of the tractor. Otherwise, it is hard to connect the couplers, and hydraulic fluid can be sprayed from the line and get in to your eyes while connecting them.
3. Remove any foreign material around the male and female couplers. If foreign material enters the hydraulic components, it can lead to malfunction of the system.
4. Open the dust-proof cover of the female coupler of the tractor and insert the male coupler of the implement. A clicking sound is heard when the couplers are engaged.
5. Pull the hydraulic hose of the implement to check that the couplers are properly connected.
6. Start the engine and check the operating status and leakage.

DISCONNECTION

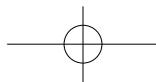
1. Make sure to stop the engine before disconnecting implements.
2. Release any residual pressure in the hydraulic hoses of the implement and tractor by operating the double acting valve lever 4 to 5 times.
3. Remove any foreign material around the couplers.
4. Lower the implement on the ground or remove any external load applied to the implement. Disconnecting hoses while outer load is applied to the implement is very difficult and dangerous due to the pressurized fluid in the hose.
5. Remove the male coupler by pushing the female coupler boss of the tractor backward.
6. Close the dust-proof cover of the female coupler of the tractor. Wrap the male coupler of the implement with a plastic bag to prevent contamination.

WARNING

- ***Never connect or disconnect the implement hydraulic hose while the pressure in it is not released or the engine is running. It is hard to connect and disconnect the hose and hydraulic fluid can be sprayed from the hose, and get into your eyes or skin.***
- ***Stop the engine and wear protective glasses and gloves before work.***



MEMO





3-POINT HITCH IMPLEMENT AND LOADER OPERATION

6

REMOVAL AND INSTALLATION OF 3-POINT HITCH IMPLEMENT (WITH P.T.O SHAFT) 6-2

MOWER IMPLEMENT6-2

HOW TO USE6-5

OPERATION TIP FOR 3-POINT HITCH ELEMENTS .. 6-6

ADJUSTMENT OF LIFT ROD6-6

ADJUSTMENT OF TOP LINK6-7

ADJUSTMENT OF STABILIZER.....6-7

DRAFT HITCH AND TRAILER.....6-8

INSTALLING PTO SHAFT6-9

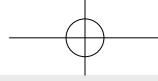
HANDLING LOADER 6-11

DRIVING ON SLOPE.....6-12

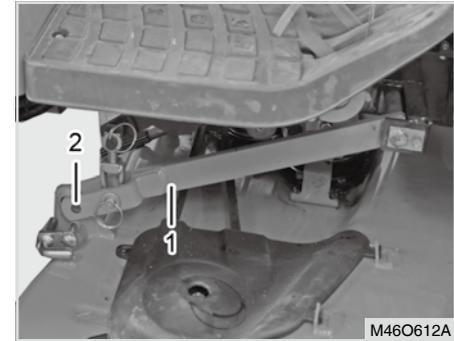
FIXATION POINTS FOR ATTACHMENT6-14

JOYSTICK LEVER.....6-15

JOYSTICK VALVE PORT.....6-18



REMOVAL AND INSTALLATION OF 3-POINT HITCH IMPLEMENT (WITH P.T.O SHAFT) MOWER IMPLEMENT



(1) Lift Control Lever

(1) Lift

(2) Connection Linkage

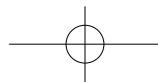
1. Park the tractor on level ground and apply the parking brake.

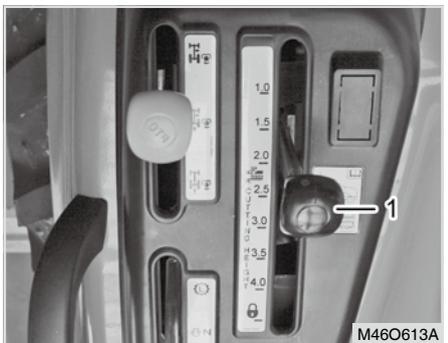
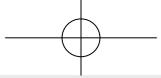
2. To lift the lower link, pull the lift control lever backward and stop the engine.

3. Roll the mower deck under the tractor and position for connection to the lift linkage.

⊕ IMPORTANT

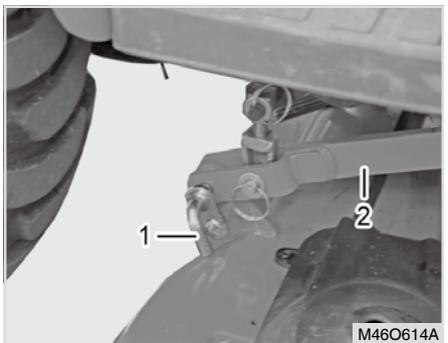
- When rolling the mower deck under the tractor, be very careful not to strike the hydraulic filter with the mower deck.





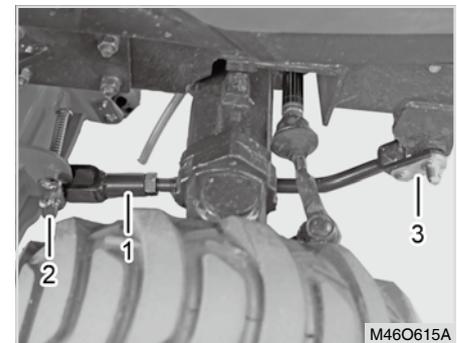
(1) Mower Height Control Lever

4. Place the mower height adjustment lever in the A position.



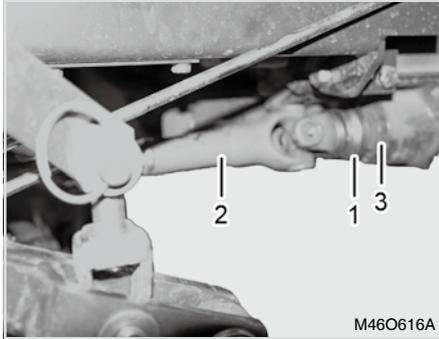
(1) Spring Loaded Handle
(2) Rear Linkage

5. Connect the rear linkage to the deck using the spring-loaded handle.



(1) Front Linkage
(2) Spring Loaded Handle
(3) Loaded Handle

6. Connect the front linkage to the mower deck using the spring-loaded handle. Connect the opposite end of the front linkage to the tractor using the spring loaded handle.



(1) Locking Collar (2) Driveshaft
(3) PTO Shaft

7. Pull the driveshaft locking collar towards the front of the tractor and slide the driveshaft onto the PTO shaft.

⊕ IMPORTANT

- Be sure locking collar is locked onto PTO shaft prior to operating the mower deck.

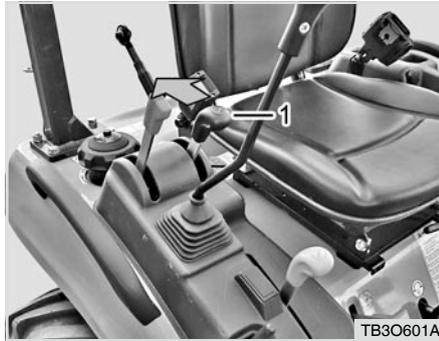
⊕ IMPORTANT

- Consult your local KIOTI Dealer for selection of the PTO shaft.
- When selecting a PTO shaft, make sure there is a minimum of 6 inches (152mm) of overlap of the PTO shaft tubes when the shaft is extended to its maximum working length between the tractor and the piece of equipment. Also make sure there is 3 inches (76mm) of clearance between the shaft tube ends and the universal joints at both ends when the PTO shaft is at its shortest working length between the tractor and the piece of equipment. If not, DO NOT USE the PTO shaft and contact a KIOTI dealer.
- Move the joint back and forth to check that its lock pin is properly seated to the groove of the PTO shaft.

10. Remove the implement in the reverse order of installation and use the implement support as necessary.

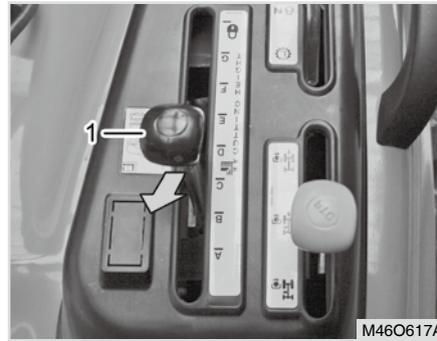


HOW TO USE



(1) Position Lever

After mower installation, raise the position lever to lift the mid mower. (At this time, the rear lever link is interlocked.)

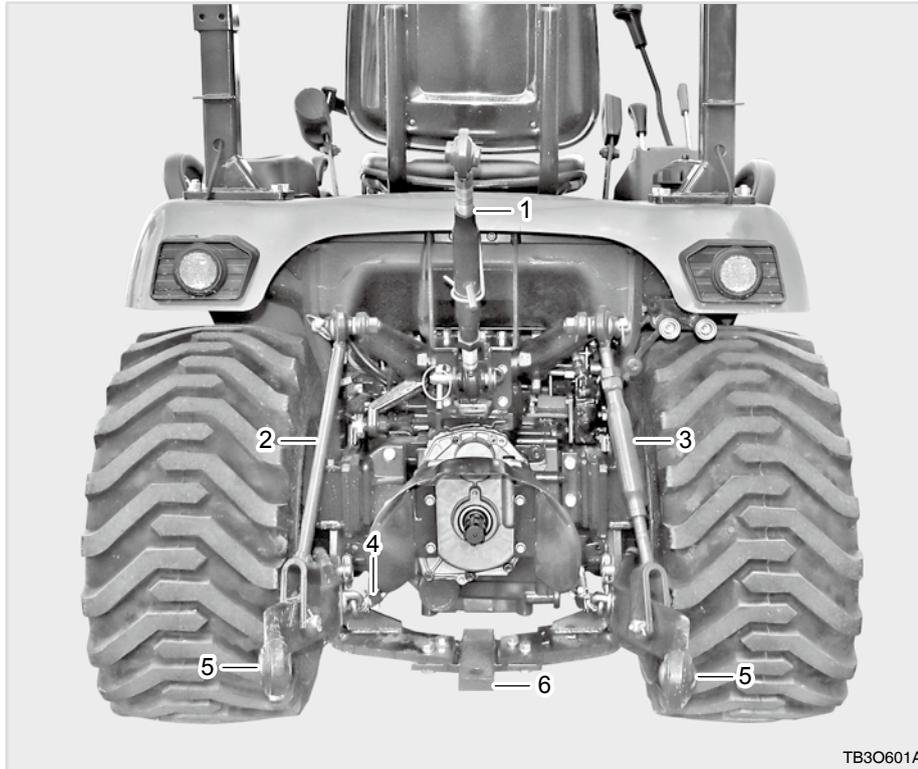


(1) Mower Height Control Lever

Move the lever to the desired mower position, lower the position lever and place the lever in the neutral position.



OPERATION TIP FOR 3-POINT HITCH ELEMENTS



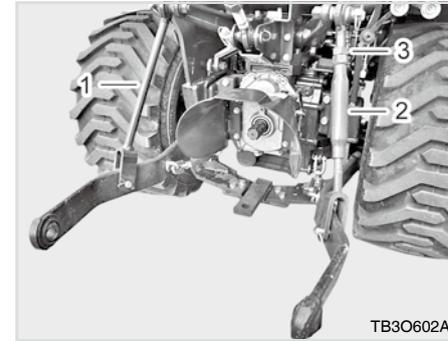
(1) Top Link
(2) Crank Lifting Rod (L)

(3) Crank Lifting Rod (R)
(4) Check Link

(5) Lower Link
(6) Drawbar

TB30601A

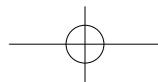
ADJUSTMENT OF LIFT ROD



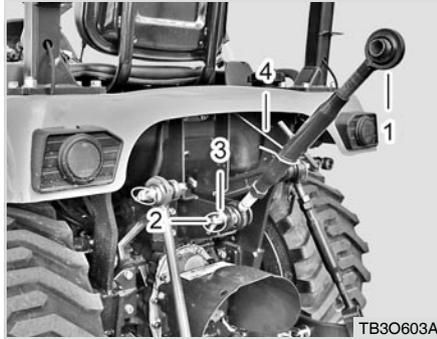
(1) Lift Rod
(3) Lock Nut

(2) Turnbuckle

1. Adjust the implement level balanced by turning the turnbuckle.
2. After adjustment, fix it with the lock nut



ADJUSTMENT OF TOP LINK



(1) Top Link (2) Pin
(3) Retainer Pin (4) Top Link Hook

1. Install the top link to the desired position, and install the pin and retainer pin.
2. Fix Top link with fixed nut after adjusting top link.

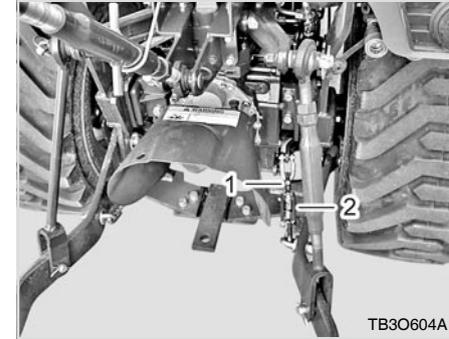
⚠ WARNING

- **Stop the engine and lower the attachment to the ground prior to disconnecting the lift rod from the lower link. Check that the attachment has proper support and that there's pressure remaining in the hydraulic system to remove the lift rod holding the pin. To eliminate the remaining pressure, move the hydraulic adjusting lever back and forth several times.**

📖 NOTE

- When there is no implement attached, fix the lower link to the check link (LH/RH) so that it does not contact with the rear wheel.
- Secure the top link to the storage hook.

ADJUSTMENT OF STABILIZER

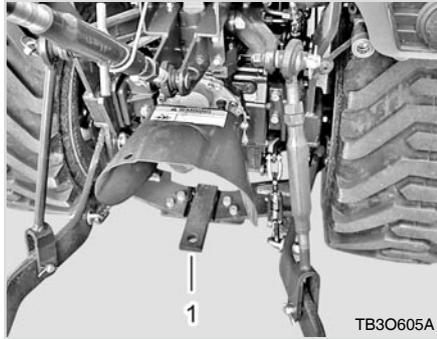


(1) Check Link (2) Turnbuckle

1. Adjust the check link control horizontal sway of the implement. It is also used to set the implement on the back of the tractor in center.
2. To adjust the check link, pull out the pin and adjust it until the desired transverse moving distance is obtained.
3. Fit the pin to the fixed hole for normal operation and long hole (moving) for draft work.



DRAFT HITCH AND TRAILER

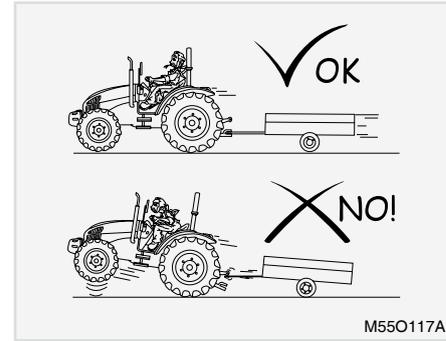
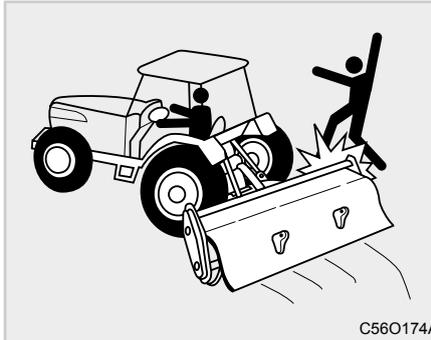


(1) Draw Bar

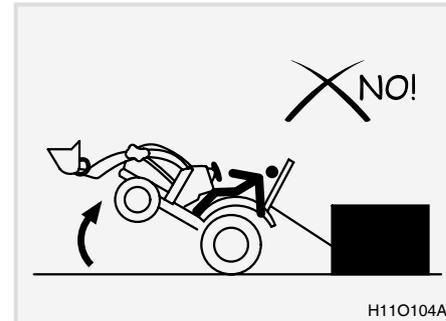
The draw bar is used to pull an implement, such as a trailer. This tractor is equipped with a fine draw bar. Make sure to check the max. towing weight of the trailer and max. vertical load that can be applied to the draw bar.

⚠ CAUTION

- When using an implement that is attached to the draw bar, such as a trailer, check if the towing hitch is firmly attached.



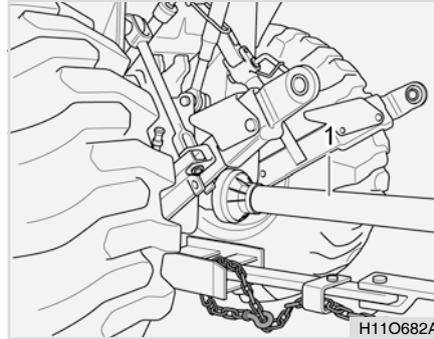
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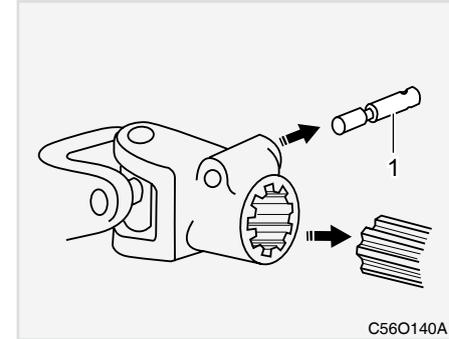
H11O104A

**⚠ WARNING**

- **Never use any other part for pulling except draw bar. Pulling with top link, ROPS and etc. will cause a fatal accident.**
- **Be sure to install the auxiliary safety chain when installing a trailer.**
- **Improper use of the draw-bar, even if correctly positioned, can cause a rear overturn.**
- **Do not overload an attachment or towed equipment. Use proper counterweights to maintain tractor stability. Hitch heavy loads to the draw-bar only.**
- **Make sure that there is nobody or not obstacle between tractor and trailer.**

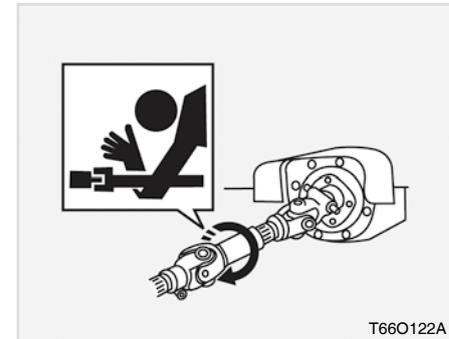
INSTALLING PTO SHAFT

(1) PTO Shaft



(1) Lock Pin

1. Consult your local **KIOTI** Dealer for selection of the PTO Shaft.
2. When selecting a PTO Shaft, make sure that it is not too short to come off of the female and male shafts at the highest position or too long to impact its female and male shafts at the lowest position.
3. Move the joint back and forth to check that its lock pin is properly seated to the groove of the PTO shaft.

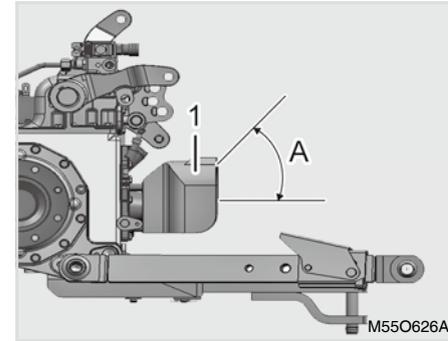


⚠ WARNING

- **Make sure that the PTO safety cover is in its position before driving the PTO shaft.**
- **Never go close to the rotating PTO or tractor PTO shaft. A severe accident can happen.**
- **Before driving an implement with the PTO, always make sure that all bystanders are well away from the tractor.**
- **When using the PTO drive with a stationary tractor, always make sure that the gears are in neutral and that the parking brake is applied.**
- **Surrounding parts should not interfere with the tractor PTO and PTO shaft.**

⚠ WARNING

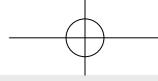
- **Before starting up any PTO-driven implement hitched to the three-point linkage, lift the implement to its full height and check that at least 1/4 of the total length of the telescopic section of the drive shaft is engaged.**



(1) PTO Cover
(A) Allowable angle of universal joint : 50°

Refer to the chart below when installing of an universal joint.

The type of PTO shaft	Allowable angle of universal joint
SAE 1-3 / 8" 6 splines	50 degree



HANDLING LOADER



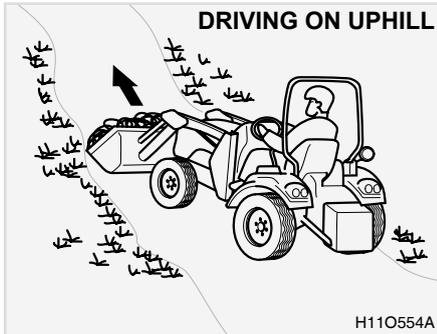
- (1) Loader Mounting Bracket
- (2) Balancing Cylinder
- (3) Boom
- (4) Tilt Cylinder
- (5) Bucket

For detailed information about installation and use of the front loader, refer to the separate manual for the loader.

+ IMPORTANT

- **Check the transmission fluid level and add fluid as necessary after installing an attachment or implement related to the hydraulic fluid, such as a loader or backhoe, and driving the tractor for a test.**

DRIVING ON SLOPE WHEN LOADED BUCKET AND REAR BALLAST ARE INSTALLED

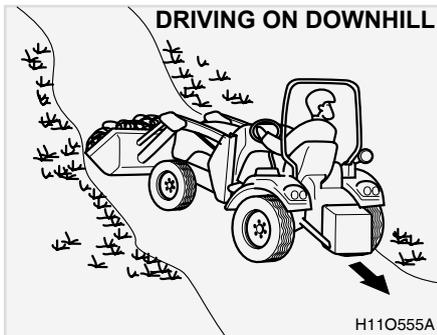


When driving uphill with a loaded bucket and rear ballast installed, keep the higher end of the tractor heavier. In other words, drive forward on uphill and backward on downhill.

! WARNING

To avoid injuries:

- *Keep the loader arm as low as possible when driving on a slope.*



WHEN UNLOADED BUCKET AND REAR BALLAST ARE INSTALLED



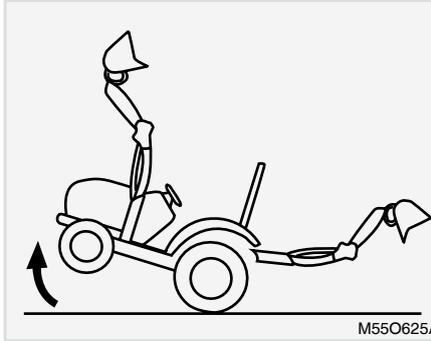


When driving on downhill with an empty bucket and rear ballast installed, keep the rear ballast toward the higher level of the ground. In other words, drive backward on uphill and forward on downhill.

Use the 4WD to increase friction when driving on a slope with a loaded bucket and rear ballast installed.

Set the bucket and implement high on a rough surface so that they are not caught by obstacles.

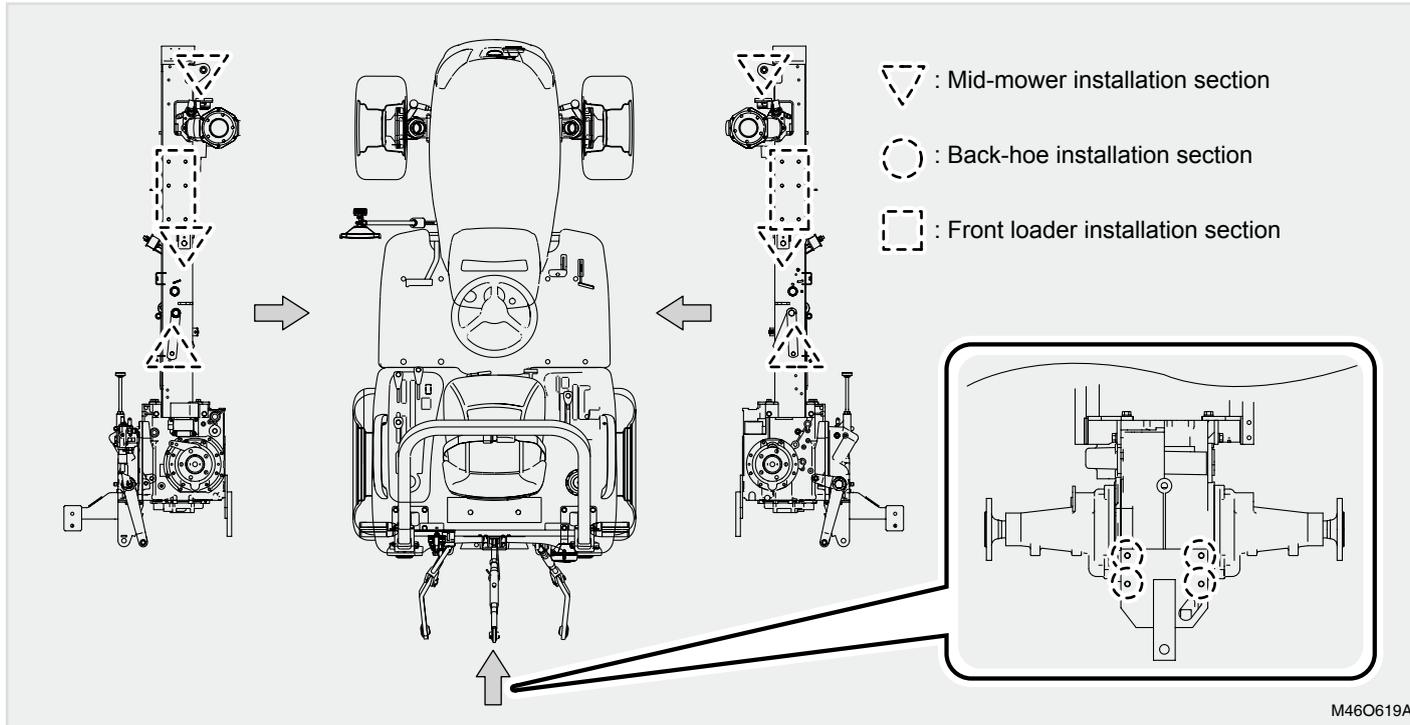
PARKING WITH LOADER INSTALLED



WARNING

- *When parking the tractor which is equipped with a loader or backhoe, make sure that the loader or the boom of the backhoe is lowered on the ground. Otherwise, the tractor can become unstable, leading to an unexpected accident, such as roll over.*

FIXATION POINTS FOR ATTACHMENT



⚠ WARNING

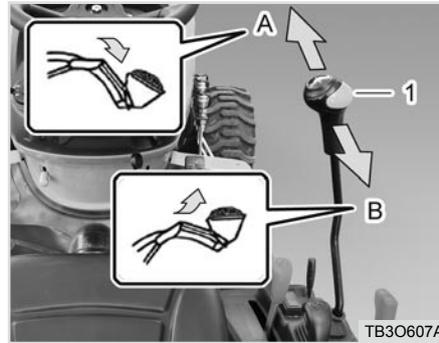
- When you do install the front loader, certainly mount the bolt for mounting bracket at indicated point.



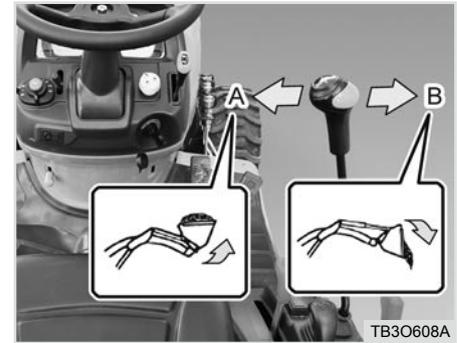
JOYSTICK LEVER



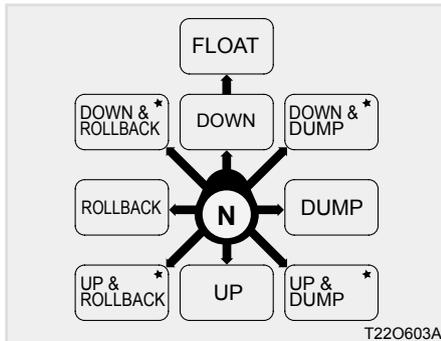
(1) Joystick Lever



(1) Joystick Lever
(A) Boom Down (B) Boom Up



(A) Bucket Roll Back (B) Bucket Dump



T220603A

1. Up and down of boom

Pulling the joystick lever back (B) lifts the boom of the loader while pushing it forward (A) lowers the loader boom.

2. Roll back & Dump

"Roll back" means that the bucket scoops up. To operate this function, move the joystick lever to the left (A). "Dump" means that the bucket dumps. To operate this function, move the joystick lever to the right (B).

3. Float

The floating function is activated when the joystick lever is pushed

one position further to forward from the down position. When the lever is in this position, the boom moves up and down freely along the surface of the ground as the hydraulic line is opened from the valve to the boom cylinder. This function is useful when removing soft objects on hard ground (for example, when removing snow or sand on paved road).

WARNING

- ***If moving the lever to the floating position while the boom is up in the air, the boom can fall freely and lead to an accident.***

4. Regen

The regen function is activated when the joystick lever is pushed one position further to the right from the dump position. The regen means "fast dumping".

5. Down & Roll back

The boom can be lowered and the bucket can be rolled back at same time by operating the joystick lever to the front left position (10 o'clock position). However, the operation time may not be shortened much since the boom is lowered first and then the bucket is rolled back later due to unbalanced hydraulic pressure in the hydraulic circuit.

6. Down & Dump

The boom can be lowered and the bucket can dump at same time by operating the joystick lever to the front right position (2 o'clock position). However, these two operations may not be performed simultaneously due to unbalanced hydraulic pressure in the hydraulic circuit.

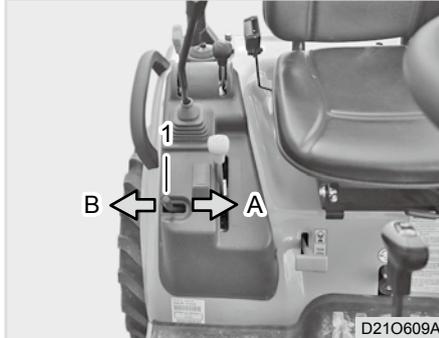
7. Up & Roll back

The boom can be lifted and the bucket can scoop up at same time by operating the joystick lever to the rear left position (7 o'clock position). However, these two operations may not be performed simultaneously due to unbalanced hydraulic pressure in the hydraulic circuit.

8. Up & Dump

The boom can be lifted and the bucket can dump at same time by operating the joystick lever to the rear right position (5 o'clock position). However, the operation time may not be shortened much since the bucket dumps first and then the boom is lifted later due to the unbalanced hydraulic pressure in the hydraulic circuit.

9. Locking / Unlocking joystick



(1) Joystick Lock Lever
 (A) Lock (B) Unlock

Pressing the joystick lock lever in, locks the joystick, while pulling it outward, unlocks the joystick as shown in the figure.

⚠ WARNING

- **Make sure to lock the joystick lever while moving. Otherwise, its vibration can cause safety problems, such as falling off of the implement.**

⚠ WARNING

- **Do not leave the tractor with the boom off the ground in any circumstances. If it is necessary, lock the joystick.**
- **When the joystick lever is not in use, lock it since the implement can fall down if the lever is operated accidentally.**

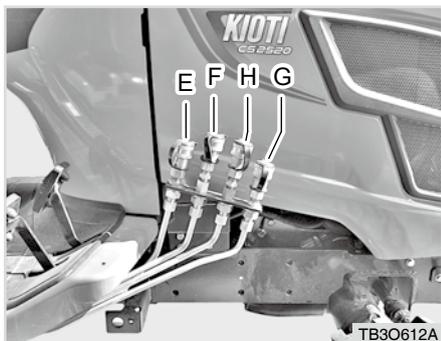
⊕ IMPORTANT

- **If the boom or bucket is not operating properly, lower the bucket onto the ground, stop the engine and move the joystick lever to remove all hydraulic pressure in the system. Then, check all the hydraulic connections and reconnect them correctly.**
- **Before connecting or disconnecting the hydraulic hose coupling from the loader, lower the boom onto the ground, stop the engine, and move the joystick lever front and back, left and right for several times to remove residual pressure in the hydraulic hose.**

⚠ WARNING

- **Pressurized diesel fuel or hydraulic fluid may be sprayed on your skin or eyes, leading to a severe injury or even death.**
- **To for leaks, use a board and wear protective gloves and goggles.**
- **If your eyes come into contact with the hydraulic fluid, seek medical attention immediately.**
- **Never try to disconnect the tube and quick coupler while the tractor and implement are in operation. Release the pressure by operating the lever after the engine is stopped.**

JOYSTICK VALVE PORT



(E) Bucket Up
(G) Boom Up

(F) Bucket Down
(H) Boom Down

PORT	DIRECTION	FUNCTION
E		Bucket Up
F		Bucket Down
G		Boom Up
H		Boom Down



MAINTENANCE

7

MAINTENANCE CHECK LIST 7-3

- DAILY CHECK CHART 7-3
- MAINTENANCE SCHEDULE CHART 7-4

LUBRICANTS 7-8

MAINTENANCE CODE..... 7-9

- HOW TO DISCONNECT THE HOOD (A)..... 7-9
- CHECKING AND ADDING FUEL (C)..... 7-9
- CHECKING TRANSMISSION FLUID LEVEL (D)..... 7-10
- CHECKING ENGINE OIL LEVEL (E)..... 7-11
- CHECKING COOLANT LEVEL (F)..... 7-13
- CLEANING GRILL, RADIATOR SCREEN (G).. 7-13
- CHECKING BRAKE AND CLUTCH PEDALS (H)..... 7-14
- CHECKING GAUGES, METER AND EASY CHECK LAMPS (I)..... 7-14
- CHECKING HEAD LIGHT, HAZARD LIGHT ETC. (J) 7-14

- CHECKING SEAT BELT AND ROPS (K)..... 7-14
- CHANGING ENGINE OIL AND REPLACING FILTER (L) 7-14
- REPLACING TRANSMISSION FLUID AND FILTER (M) 7-16
- CHANGING FRONT AXLE CASE OIL (N)..... 7-18
- ADJUSTING BRAKE PEDAL (O)..... 7-19
- LUBRICATING GREASE FITTINGS (P)..... 7-21
- CHECKING WHEEL BOLT/NUT TORQUE (Q) .. 7-22
- ADJUSTING CLUTCH PEDAL (R) 7-22
- REPLACING AIR CLEANER PRIMARY ELEMENT (T) 7-23
- CHECKING FUEL LINES (U)..... 7-24
- BLEEDING FUEL SYSTEM (AK)..... 7-25
- CHECKING INJECTION NOZZLE AND FUEL INJECTION PUMP 7-26
- ADJUSTING FAN BELT TENSION (V) 7-27
- BATTERY (W) 7-28
- CHECKING INTAKE AIR LINE (X)..... 7-30
- ADJUSTING TOE-IN (Y)..... 7-30



MAINTENANCE

CHECKING RADIATOR HOSE AND
CLAMP (Z)..... 7-31

POWER STEERING LINE (AA)..... 7-32

ADJUSTING ENGINE VALVE CLEAR-
ANCE (AE)..... 7-32

REPLACING AIR CLEANER FILTER (AF) ... 7-32

FLUSH COOLING SYSTEM AND CHANG-
ING COOLANT (AJ) 7-33

ANTI-FREEZE..... 7-35

REPLACING FUSE (AN) 7-35

SLOW BLOW FUSE (AP) 7-37

REPLACING BULB (AQ) 7-38



MAINTENANCE CHECK LIST

DAILY CHECK CHART

SERVICE SCHEDULE		MAINTENANCE CODES
ITEM	SERVICE REQUIRED	
Engine oil	Check the oil level and add needed. Do not overfill	E
Hydraulic (Trans / Diff) fluid	Check level and add as needed	D
Engine air filter and air system	Check condition indicator (if equipped) Check for leaks and damaged components. Do not use compressed air to clean elements	T
Engine cooling system	Clean debris from oil cooler, radiator, screen and grills Check coolant level cold, add premixed coolant as needed	F, G, AH
Seat belt	Check the condition of seat belt and mounting hardware. Repair or replace as needed	
Tires	Check for wear, damaged tires and ensure for proper sized tires and correct air pressure	
Parking brake	Check operation and have dealer adjust if required	
Clean pedal	Clean brake pedal, travel control pedal	H
General items	Check for loose or broken parts, damaged operator cab, instrument operation, loose wheel nuts / bolts, oil leaks and damaged or missing signs (decals) Replace floor mat if damaged or missing	Q, AG, AH, AM
P.T.O	Inspect the splines. Replaced damaged or missing shields and guards	
Three-point linkage	Check operation and condition of pins, links and bars	
Implements (If equipped)	Check mounting hardware for loose or broken parts	

※ For detailed information about maintenance codes, refer to the corresponding section in each chapter.



MAINTENANCE SCHEDULE CHART

NO.	Item	Maintenance Interval	Run Hour										Run Age		Remarks	Maintenance codes			
			10	50	100	200	250	400	600	800	1500	3000	1 Year	2 Year					
1	Engine oil & Filter	Change		⊙	○									○				L	
		Check			○														E
2	Transmission oil filter	Replace		⊙		○												M	
3	HST oil filter	Replace		⊙		○												M	
4	Transmission fluid	Change							○									M	
	Transmission fluid level	Check	⊙															D	
5	Front axle oil	Change							○									N	
	Front axle oil level	Check	⊙																
6	Front axle pivot	Adjust							○										
7	Engine start system	Check		○															
8	Greasing	Apply		○														P	
9	Wheel bolt torque	Check		○														Q	
10	Battery condition	Check			○												*3	W	
11	Air cleaner element	Check	⊙																
		Clean			○												*1	#	T, AF
		Replace				○							○		*2				



NO.	Item	Maintenance Interval	Run Hour										Run Age		Remarks	Maintenance codes		
			10	50	100	200	250	400	600	800	1500	3000	1 Year	2 Year				
12	Fuel filter element	Replace				○											#	
13	Fan belt, Air-con belt	Adjust			○												*3	V
14	Clutch pedal free play	Adjust		⊙	○													H, R
15	Brake pedal free play	Adjust		⊙	○													O
16	Radiator hose and clamp	Check				○												Z
		Replace												○				
17	Radiator grill	Clean	⊙															
18	Power steering hose and oil line	Check				○												AA
		Replace												○				
19	Fuel line	Check			○													#
		Replace												○				
20	Intake air line	Check				○												X
		Replace												○		*3		
21	Toe-in	Adjust				○												Y
22	Engine valve clearance	Adjust								○								
23	Fuel injection nozzle injection pressure	Check									○							#



7-6 CS2220H(S)/CS2520H(S)

NO.	Item	Maintenance Interval	Run Hour										Run Age		Remarks	Maintenance codes	
			10	50	100	200	250	400	600	800	1500	3000	1 Year	2 Year			
24	Injection pump	Check											○			#	
25	Cooling system	Clean													○		G
26	Coolant	Replace													○		AE
	Coolant level	Check	◐														
27	Air-con filter	Replace											○				
28	Fuel system	Check													*3	C, S	
29	Fuse	Replace													*3	AG, AH	
30	Light bulb	Replace													*3	AI	
31	Seat belt	Check	○														
32	Tire pressure & damage	Check	○														
33	Parking brake	Check	○														
34	PTO cover	Check	○														
35	3-point hitch & drawbar	Check	○														
36	Pin fastening	Check	○														

**⊕ IMPORTANT**

- **⊙ must be done after the first 10 or 50 hours of operation.**
 - * 1 Air cleaner should be cleaned more often in dusty conditions than in normal condition.
 - * 2 Every year or every 6 times of cleaning. * 3 Replace only if necessary.
- **The items listed above (# marked) are registered as emission related critical parts by KIOTI in U.S. EPA exhaust emission standard non-road emission regulation. As the engine owner, you are responsible for the performance of the required maintenance on the above instruction.**

LUBRICANTS

To prevent serious equipment damage, use only genuine **KIOTI** fluids, oils and greases, or equivalents.

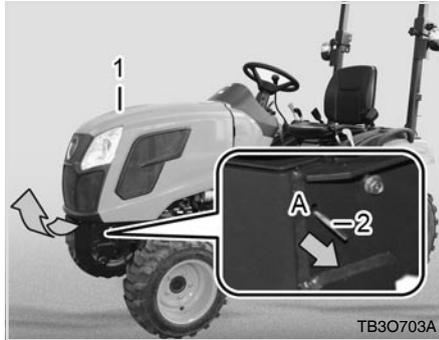
No.	Section	Capacity [U.S.gal. (L)]	Lubricants
		CS2220H(S)/CS2520H(S)	
1	Fuel	6.7 (25.5)	Ultra-low sulfur diesel (Sulfur content: 15 ppm or less)
2	Coolant	0.87 (3.3)	An antifreezing solution(Ethylene glycol) + Pure water (50:50)
3	Engine oil	1.0 (3.8)	Oil Viscosity : SAE 15W40
4	Transmission oil	2.75 (10.4)	Daedong : UTF 55 Shell : Donax-TD, Exxonmobil : Mobilfluid 424 Exxon Hydraul 560 BP : Tractran UTH
5	Front axle oil	0.53 (2.0)	SAE 90 gear oil or better, or same as T/M oil
6	Apply grease • Front axle support • Brake pedal • Brake lever • Top link holder • Control lever	As needed or check daily	SAE Multi purpose type grease

WARNING

- **Check the oil level regularly. Correct the oil level, if needed, before operating equipment.**
- **Always check and add oil with the tractor off on a flat, level surface.**



MAINTENANCE CODE HOW TO DISCONNECT THE HOOD (A)



(1) Hood
(A) Pull

(2) Handle



(1) Hood

1. The hood can be opened by pulling down or the handle loosen or the lower right hand side of tractor. Push down ward or bonnet to release latch.
2. To close the hood, press its front down until it is locked in its position.
3. Do not apply excessive force to the handle to fix it. The hood can be damaged.

CAUTION

- Never open the hood while the engine is running.

NOTE

- If noise is heard from the hood during driving, check the rubber molding and replace it if damaged.

CHECKING AND ADDING FUEL (C)



(1) Fuel Tank Cap

Make sure to use pure and high-quality diesel fuel.

Fuel tank capacity

6.7 U.S.gal. (25.5 L)

1. Turn the key switch to "ON", check fuel level or fuel gauge.
2. If the needle on the fuel gauge is near to the red zone ("E") or the fuel level is low, open the fuel tank filler cap and add more fuel.
3. After adding fuel, close the fuel tank cap.

⚠ CAUTION

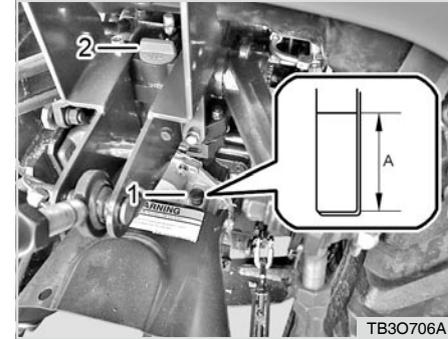
To avoid personal injury:

- Do not smoke while refueling.
- Add the fuel in a well-ventilated area.
- Be sure to stop the engine before refueling.
- Dirt or sand contaminate in fuel may cause the fuel injection pump to malfunction, use the strainer when refuelling.

⊕ IMPORTANT

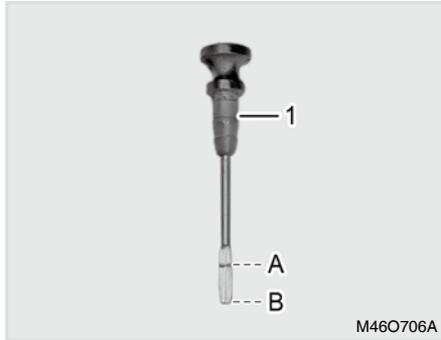
- Do not permit dirt or trash to get into the fuel system.
- Be careful not to let the fuel tank become empty, otherwise air will enter the fuel system, necessitating bleeding before next engine start.
- Be careful not to spill fuel during refueling should it spill, wipe it "OFF" at once, or it may cause a fire.
- To prevent condensation (water) accumulation in the fuel tank, fill the tank before parking overnight.
- If it is not used for a long time, make sure the fuel viscosity is suitable for the cold weather.

CHECKING TRANSMISSION FLUID LEVEL (D)



(1) Gauge (2) Oil Filler Plug
(A) Oil level is acceptable within range

1. Park the machine on a flat surface, lower the implement and shut "OFF" engine.
2. Depress the brake pedals and apply the parking brake.
3. Set all shift levers into the neutral position.
4. Stop the engine.



(1) Oil Dipstick
(A) Upper Limit

(B) Lower Limit

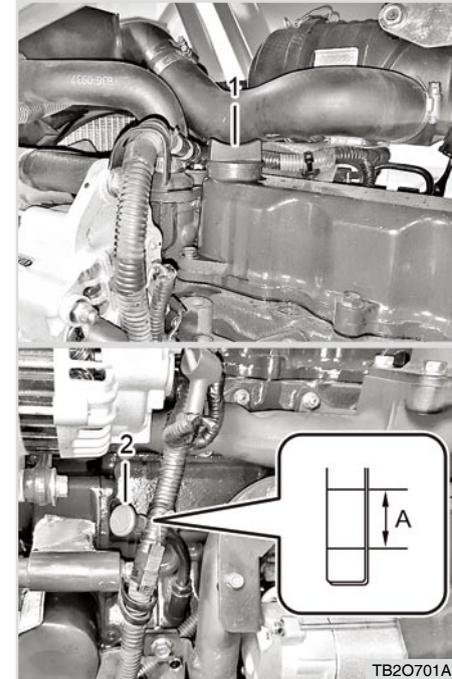
⊕ IMPORTANT

- If oil level is low, do not run engine.
- Never add the oil over the upper limit.

5. Pull out the oil dipstick, clean it, and then insert it into its original position. Then, pull it out again and check if the oil level is within the specified range.

6. If the oil level is too low, add some new oil so that the level is within the allowable range. (Refer to "Replacing transmission fluid and filter" in the chapter "Service")

CHECKING ENGINE OIL LEVEL (E)



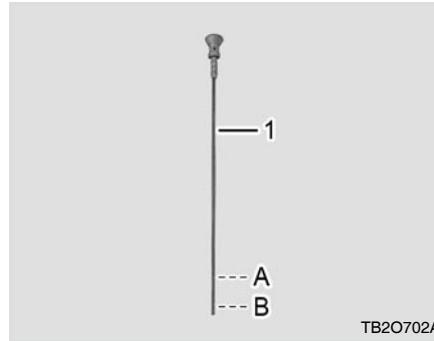
(1) Oil Inlet Plug (2) Gauge
(A) Oil level is acceptable within this range

1. Check engine oil daily.
2. Park the tractor on level ground and lower implement.
3. If the engine was just running, wait for approx. 10 minutes before checking the oil level.

⚠ CAUTION

To avoid personal injury:

- Be sure to stop the engine before checking the oil level.



(1) Oil Dipstick
(A) Upper Limit

(B) Lower Limit

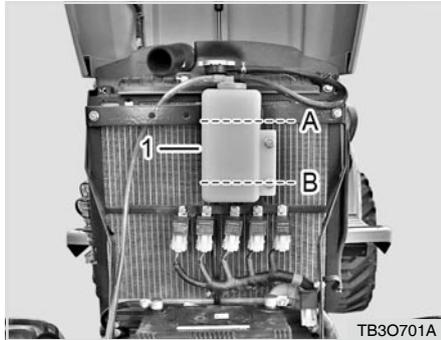
4. Pull out the oil dipstick, clean it, and then insert it into its original position. Then, pull it out again and check if the oil level is within the specified range.
5. If the oil level is too low, add some fresh oil so that the level is within the allowable range. (Refer to "Lubrication" in the chapter "Service")

⊕ IMPORTANT

- When using oil of different maker or viscosity from the previous one, remove all of the old oil. Never mix two different types of oil.
- Do not start the engine when the oil level is below specification.
- Wipe the oil dipstick with a clean cloth or tissue. If foreign material enters the tank, it can lead to malfunction of the engine.
- Never add the oil over the upper limit of the dipstick.



CHECKING COOLANT LEVEL (F)



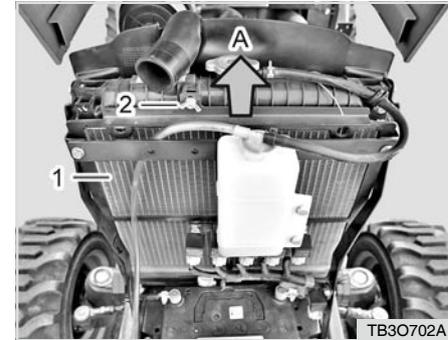
(1) Reserve Tank
(A) FULL (B) LOW

1. Check to see that the coolant level is between the "FULL" and "LOW" marks of recovery tank.
2. When the coolant level drops due to evaporation, add water only up to the full level.

In case of leakage, add anti-freeze and water in the specified mixing ratio up to the FULL level. (See "Flush Cooling System and Changing Coolant" in every 2 years maintenance)

3. The tractor is furnished with a mixture of anti-freeze and water in a ratio of 50:50 which is usable in any season.

CLEANING GRILL, RADIATOR SCREEN (G)



(1) Radiator Screen (2) Bolt
(A) Detach

1. Check front grill and side screens to be sure they are clean of debris.
2. Unscrew the bolt, lift out the radiator screen and remove all the foreign material.

CAUTION

To avoid accidents:

- Be sure to stop the engine before removing the screen.

⊕ IMPORTANT

- **Bonnet Grill and screen must be clean from debris to prevent engine from overheating and to allow good air intake for the air cleaner.**

CHECKING BRAKE AND CLUTCH PEDALS (H)

1. The brake and clutch pedals should be inspected for free travel, and smooth operation.
2. You should adjust these pedals if an incorrect measurement is found. (Refer to the instructions for adjusting the clutch and brake pedals in the Chapter Maintenance.)

📖 NOTE

- When depressing the brake pedals separated, both brake pedal should moved down to the same depth.

CHECKING GAUGES, METER AND EASY CHECK LAMPS (I)

1. Inspect the instrument panel for broken gauge(s), meter(s) and Easy Check lamps.
2. Replace if broken.

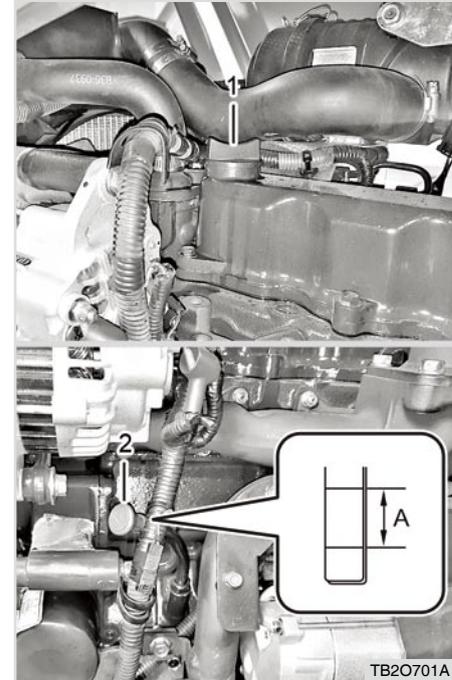
CHECKING HEAD LIGHT, HAZARD LIGHT ETC. (J)

1. Inspect the lights for broken bulbs and lenses.
2. Replace if broken.

CHECKING SEAT BELT AND ROPS (K)

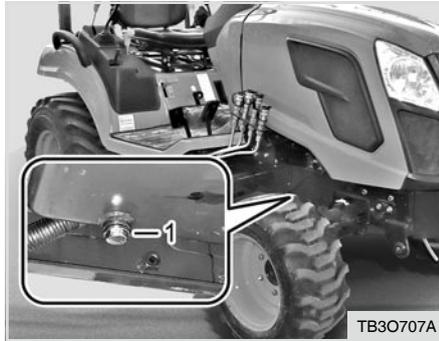
1. Always check condition of seat belt and **ROPS** attaching hardware before operating tractor.
2. Replace if damaged.

CHANGING ENGINE OIL AND REPLACING FILTER (L)



(1) Oil Inlet Plug (2) Gauge
(A) Oil level is acceptable within this range

1. Park the tractor on level ground and start the engine to warm it up.



(1) Drain Plug



(1) Engine Oil Filter

2. Stop the engine, apply the parking brake, and remove the drain plug.
3. To drain the used oil, remove the drain plug at the bottom of the engine and drain the oil completely into the oil pan.
All the used oil can be drained out easily when the engine is still warm.
4. Remove engine oil filler cap to allow easy draining of engine oil.

5. Remove the oil filter behind the cooling fan on the right side of the engine.
6. Apply a thin film of oil to the O-ring of a new filter and tighten the O-ring firmly by hand.
7. Add the engine oil to the specified level and tighten the oil filter to the specified torque.

Oil capacity (with filter)

1.0 U.S.gal. (3.8 L)

7. Run the start motor for approx. 10 seconds to deliver oil to each part.
8. Run the engine for approx. 5 minutes and check if the oil warning lamp comes on. If it does not come on, stop the engine. (It is normal that the oil warning lamp is off while the engine running)
9. Check the engine oil level again with the oil dipstick. If the level is low, add more oil.

NOTE

- The engine oil filter should be replaced when changing the engine oil.



▲ WARNING

- *The engine oil is very hot while the engine is running or right after the engine is stopped. Be careful not to get burned.*
- *Avoid oil contact while changing or adding engine oil and wear eye protection to prevent injury to eyes.*
- *Prolonged and repeated contact with the engine oil may cause skin disorders and skin cancer. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.*
- *Keep the used oil out of reach of children.*

▲ CAUTION

To avoid personal injury:

- **Be sure to stop the engine before changing the oil or replacing the filter.**
- **Check the engine oil level before every operation of the tractor. If the engine oil is insufficient, the engine can be damaged, and this is not covered by warranty. Be sure to add engine oil when its level is below the lower mark of the oil dipstick.**
- **Do not dispose of used oil and oil filter into drainage and other places not designated by regulations. Observe applicable regulations when disposing used oil and filters.**

⊕ IMPORTANT

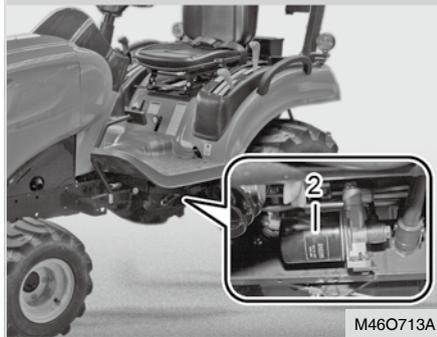
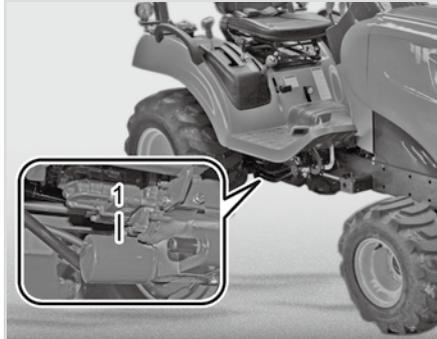
- **Use only KIOTI genuine engine oil and filters to insure smooth operation and durability of the engine.**

REPLACING TRANSMISSION FLUID AND FILTER (M)

The transmission fluid should be changed if it is contaminated or after the transmission is serviced.

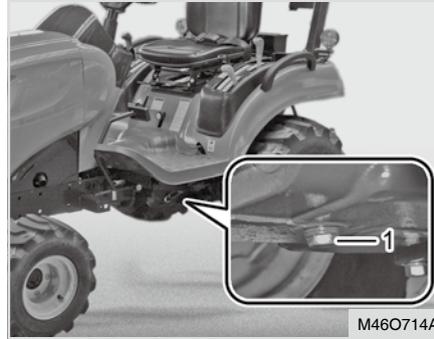
When changing the transmission fluid, make sure to change the fluid filter.

However, replace only the filter after initial 50 hour operation.



(1) Oil Filter Cartridge
(2) HST Hydraulic Filter Cartridge

1. Park the tractor on a level ground and start the engine to warm it up.
2. Stop the engine, apply the parking brake, and remove the drain plug.

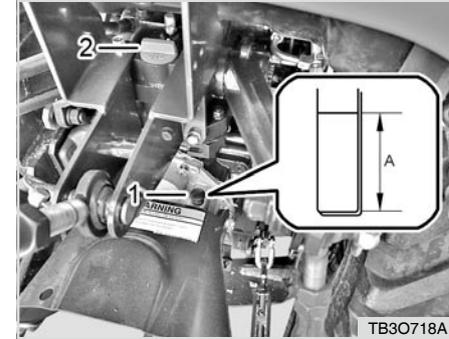


(1) Drain Plug

3. To drain the used fluid, place the oil pan under the transmission case and turn the drain plug counterclockwise to drain the fluid completely.

If the fluid does not flow out freely, unscrew the plug on the side of the hydraulic cylinder on the left of the top link bracket to facilitate drainage.

4. Unscrew the fluid filter from the rear right section on the tractor using a filter wrench.



(1) Gauge (2) Oil Filler Plug
(A) Oil level is acceptable within range

5. Apply a thin film of clean oil onto the O-ring of a new filter.
6. Tighten the filter firmly until it contacts the mounting surface. Tighten the filter a half turn further by hand.
7. Run the engine for a few minutes and then stop it after installing a new filter.
8. Check the fluid level and add fluid to the specified level.



Oil capacity

2.75 U.S.gal. (10.4 L)

9. Make sure that the transmission fluid does not leak through the seal.

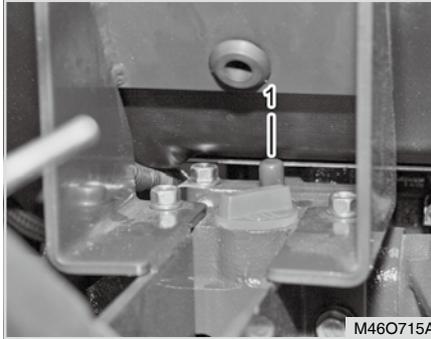
⚠ CAUTION

To avoid personal injury:

- Be sure to stop the engine before changing the fluid or replacing the filter.
- Cool down the fluid sufficiently. You can get burnt by hot fluid.

⊕ IMPORTANT

- To prevent serious damage to the hydraulic system, use only a KIOTI genuine filter.
- Do not operate the tractor immediately after changing the transmission fluid. Run the engine at medium speed for a few minutes to prevent damage to the transmission.

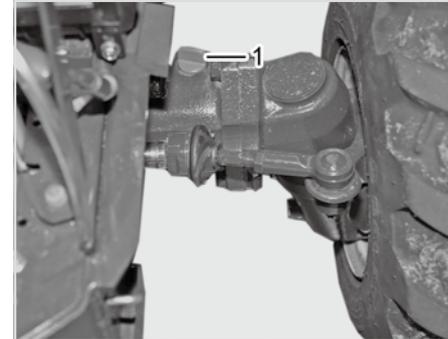


(1) Air Bleeding Plug

⊕ IMPORTANT

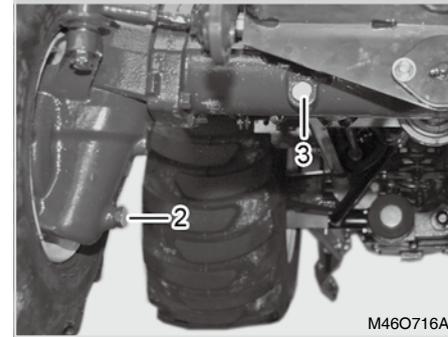
- When adding the fluid, unscrew the bleeding plug on the left of the hydraulic cylinder. Other-wise, the fluid can overflow.

CHANGING FRONT AXLE CASE OIL (N)

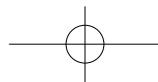


(1) Oil Filler Plug

(3) Oil Check Plug

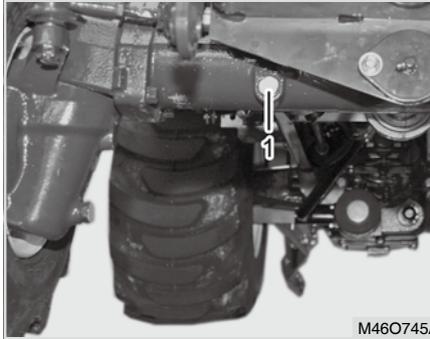


(2) Drain Plug





- 1 To drain the used oil, remove the right and left drain plugs and filling plug at the front axle case and drain the oil completely into the oil pan.
2. After draining reinstall the drain plugs.
3. Remove the oil filler plug and oil level check plug. (commonly shared component)



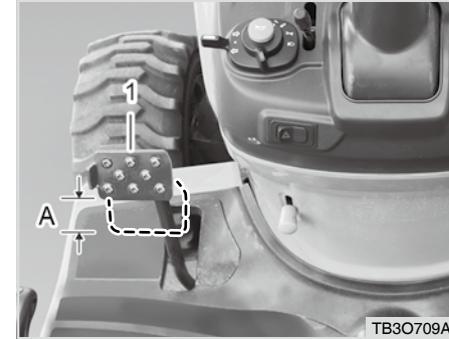
(1) Oil Check Plug

4. Add new oil to the specified level of the check plug through the oil filler. (Refer to “Lubrication” in the chapter “Service”)
5. Tighten the oil filler plug and oil check plug after replenishment.
6. Check the oil level after 15 minutes and add oil as necessary.

Oil capacity

0.53 U.S.gal. (2.0 L)

ADJUSTING BRAKE PEDAL (O)

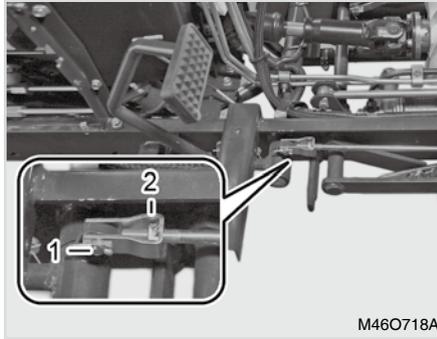


(1) Brake Pedal
(A) Free Play

Using the brake pedal for an extended period of time causes it to play. This may lead to deterioration of the braking performance and malfunction of the braking system.

The brake pedal can be adjusted as follows:

1. Release the parking brake.
2. Slightly depress the pedals and measure the free travel at the top of the pedal stroke.



M46O718A

(1) Pin

(2) Turn Buckle

Proper brake pedal free travel (A)	0.8 ~ 1.2 in. (20 ~ 30 mm)
	Keep the free travel in the right and left brake pedals equal

⚠ CAUTION

To avoid personal injury:

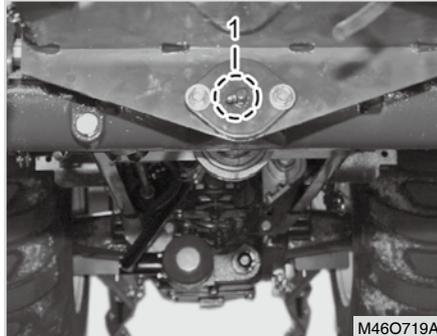
- **Stop the engine and chock the wheels before checking brake pedal.**

3. Release the pin and turn the turn buckle to adjust the brake pedal.



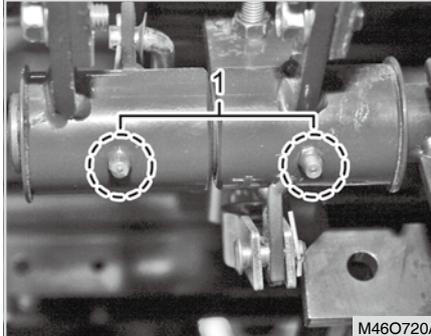
LUBRICATING GREASE FITTINGS (P)

Apply high-quality multi-purpose grease onto the positions in the figure at every 50 hours of operation or whenever necessary and record the operating time when applying it.



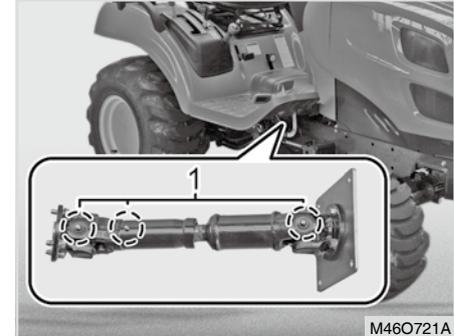
(1) Front Bracket Axle Pivot

M46O719A



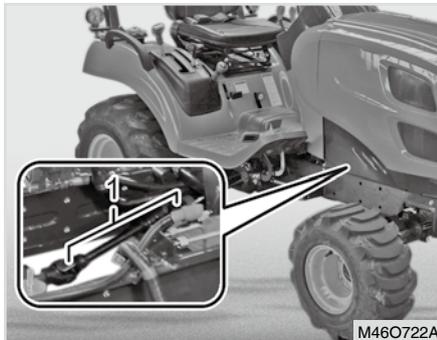
(1) HST Pedal

M46O720A



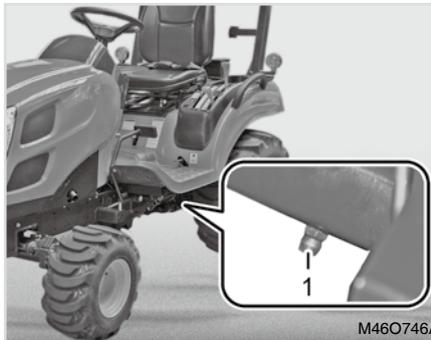
(1) Main Shaft Joint

M46O721A



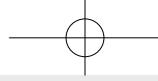
(1) 4WD Joint

M46O722A

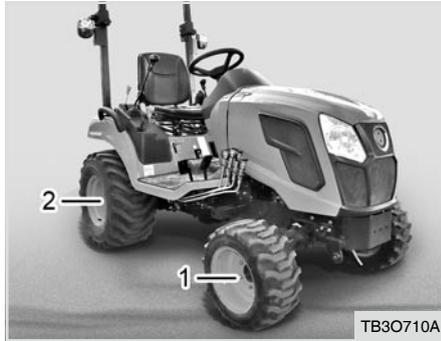


(1) Brake Shaft

M46O746A



CHECKING WHEEL BOLT/NUT TORQUE (Q)



(1) Front Wheel Bolt / Nut
(2) Rear Wheel Bolt / Nut

Check wheel bolts and nuts regularly especially when new. If they are loose, tighten them as follows.

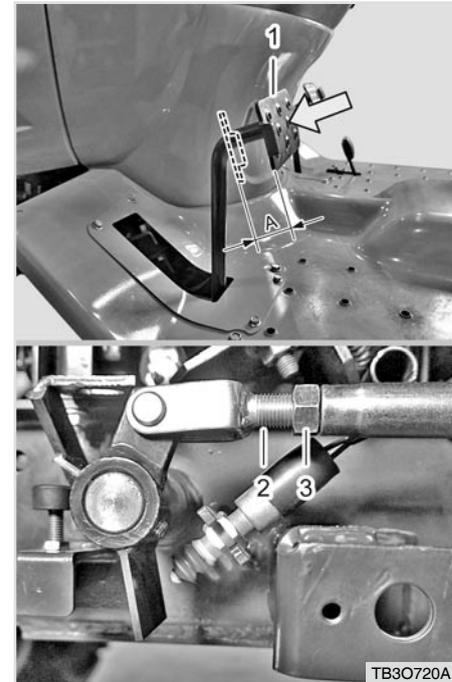
Item		Tightening torque
Front wheel	Bolt	88 N·m (8.97 kgf·m)
	Nut	88 N·m (8.97 kgf·m)
Rear wheel	Bolt	122 N·m (12.44 kgf·m)
	Nut	122 N·m (12.44 kgf·m)

⚠ CAUTION

To avoid personal injury:

- Never operate tractor with a loose rim, wheel, or axle.
- Any time bolts and nuts are loosened, retighten to specified torque.
- Check all bolts and nuts frequently and keep them tight.

ADJUSTING CLUTCH PEDAL (R)



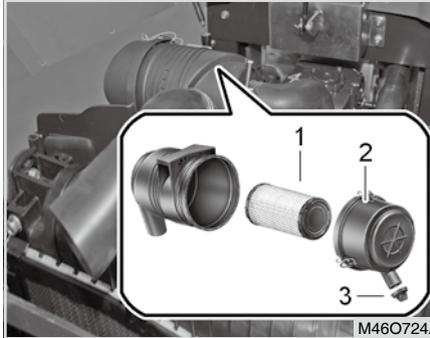
(1) Brake Pedal
(2) Clutch Cable
(3) Lock Nut
(A) Free Play



1. If the clutch does not operate properly due to its excessive play, or periodically, adjust its play.
2. To adjust the free play, unscrew its lock nut and adjust the clutch cable.
3. After setting the play properly, tighten the lock nut firmly.

Proper clutch pedal free play (A)

20~30 mm (0,79~1,18 in.)

REPLACING AIR CLEANER PRIMARY ELEMENT (T)

(1) Element (2) Cap
(3) Evacuator Valve

1. The air cleaner uses a dry element. Never apply oil.
2. Dust should not accumulate in the dust cap or element. Remove and clean the dust cap and the element every week. If the tractor is operated in extremely dusty conditions, daily inspection is required.
3. Do not touch the filter element except in cases where cleaning is required.

4. When cleaning the element, refer to the instructions that follow.
5. If the element is stained with carbon, dust or oil, replace the filter.
6. Change the element every 6 months or every 100 hours.

To clean the element, use only clean dry compressed air on the inside of the element. Air pressure at the nozzle must not exceed 29 psi (2 kgf/cm²). Maintain reasonable distance between the nozzle and the filter.

⊕ IMPORTANT

- **The air cleaner will only fulfill its function if it is correctly and regularly maintained. A poorly maintained air cleaner will mean loss of power, excessive fuel consumption and a reduction in engine life.**



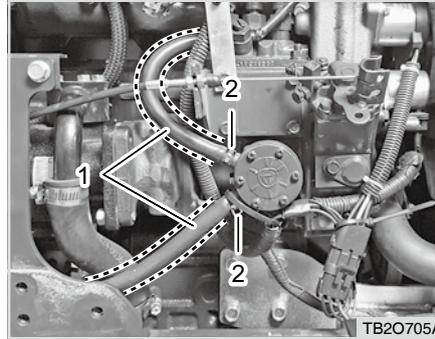
⊕ IMPORTANT

- Do not run the engine with filter element removed.
- Be sure to refit the cap with the arrow ↑ (on the rear of cover) upright. If the cap is improperly fitted, evacuator valve will not function and dust will adhere to the element.

EVACUATOR VALVE

Open the evacuator valve once a week under ordinary conditions or daily when used in dusty conditions to get rid of large particles of dust and dirt.

CHECKING FUEL LINES (U)



(1) Fuel Pipe (2) Tightening Band

Although checking the fuel pipe connection is recommended every 100 service hours, it should be done every 6 months if operation does not exceed 100 hours in 6 months.

1. If the hose clamps are loose, apply a slight coat of lubricant onto the threads and securely tighten it.
2. The fuel pipe is made of rubber and ages regardless of period of service. Change the fuel pipe together with the hose clamps every two

years and securely tighten.

3. If the fuel pipes and hose clamps are found damaged or deteriorated earlier than two years, then change them immediately.
4. After the fuel pipe and hose clamps have been changed, bleed the fuel system.

⚠ WARNING

- **Stop the engine when checking the items above.**
- **The fuel pipes are subject to wear and aging. Failure to perform periodic inspections may lead to a fuel leak. Fuel leaking on a hot engine could cause a fire.**

**⊕ IMPORTANT**

- **When changing fuel pipes, be careful not to allow dust or dirt to enter the fuel system. Contaminations in the fuel system could damage the fuel system or injection pump. Pay extra caution to the fuel pump to prevent dust from entering it.**

BLEEDING FUEL SYSTEM (AK)

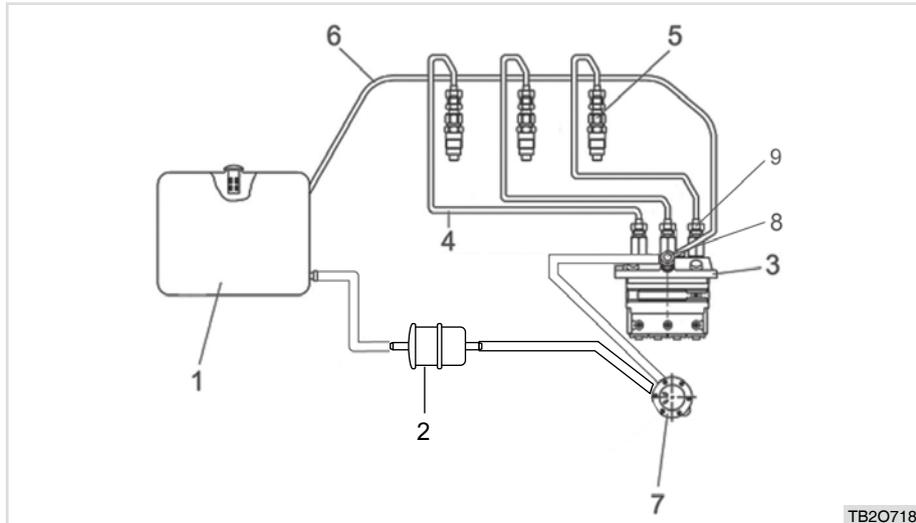
The fuel line for the **KIOTI** engine is designed to be bled automatically. If the engine still cannot be started even after 4~5 times of cranking, bleed as followed:

Do not crank the engine for more than 5 seconds continuously at a time to protect the start motor and battery.

📖 NOTE

- It is recommended to start servicing after filling the fuel tank to its top for easy bleeding, as it might be needed to bleed the fuel line after servicing the fuel system.

1. Park the vehicle on level ground and apply the parking brake firmly.
2. Make sure that the fuel is sufficient in the fuel tank. If necessary, fill the fuel tank with fuel.
3. Unscrew the bleeding bolt (1) slightly and crank the engine. Check that air comes out of the gap.
4. When air bubbles are not seen any more in the drained fuel, screw the bleeding bolt and try to start the engine 2~3 times again.
5. If the engine still cannot be started, unscrew the nozzle holder nuts (9) of the No. 1 and 3 cylinders and crank the engine to check that air comes out.
6. When air bubbles are not seen any more in the drained fuel, tighten the nuts and start the engine.
7. Check for oil leakage after starting the engine.T



(1) Fuel Tank
 (2) Fuel Filter
 (3) Fuel Injection Pump

(4) Injection Pipe
 (5) Injection Nozzle
 (6) Fuel Overflow Pipe (Hose)

(7) Fuel Feed Pump
 (8) Bleeding Bolt
 (9) Nozzle Holder Nut

CHECKING INJECTION NOZZLE AND FUEL INJECTION PUMP

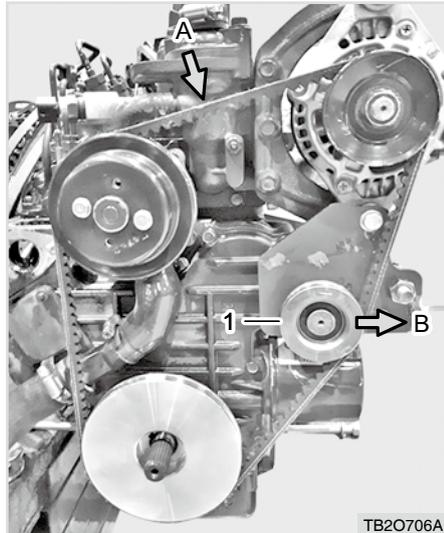
The injection nozzle and injection pump can be inspected only by a qualified service personnel. For detailed information, contact your **KIOTI Dealer**.

⊕ IMPORTANT

- **Modifying sealed parts in the fuel system, such as the flow limit bolt and engine rpm limit bolt, is strictly prohibited by the emission regulations. If such regulations are not followed, it will not be covered by warrant and will void any warranty.**

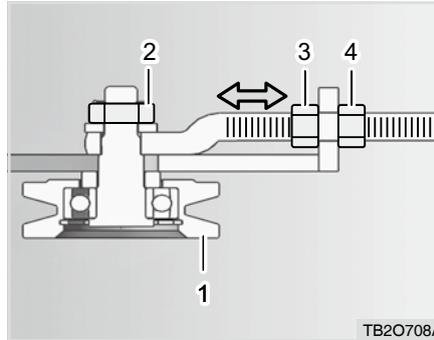


ADJUSTING FAN BELT TENSION (V)



(1) Belt Tension Pulley
(A) Adjusting Belt Tension (B) Pull

In order to extend the fan belt's life-time, the tension of the belt should be correctly adjusted if it slips. The belt tension should be inspected regularly according to the following procedure:



(1) Belt tension Pulley (2) Lock Nut
(3) Belt tension adjustment nut (inner)
(4) Belt tension adjustment nut (outer)

1. Stop the engine and apply the parking brake.
2. Open the hood and loosen the lock nut on the inside of the belt tension pulley.
3. To secure the bolt, loosen the inner nut on the inside of the tensioner; then, turn the outer tensioner nut in the clockwise direction.

4. Apply moderate thumb pressure to the belt between pulleys.

Proper fan belt tension (A)

Adjust the tensioner pulley so that the belt deflection is 14 ~ 16 mm when the area between the alternator and the fan pulley is pressed with a force of 10 kgf.

5. Once the tension is correct, tighten the inner tensioner nut and the lock nut on the inside of the tensioner pulley.
6. Replace the fan belt if it is damaged or cracked.

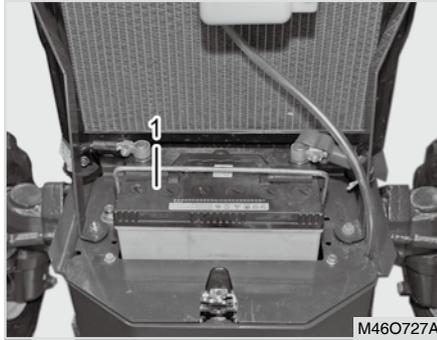
CAUTION

To avoid personal injury:

- Be sure to stop the engine before checking belt tension.



BATTERY (W) PRECAUTIONS FOR HANDLING



(1) Battery

Mishandling the battery shortens the service life and adds to maintenance costs. If the battery is insufficiently charged, the headlights may dim and the engine is hard to start. It is important to inspect the battery periodically.

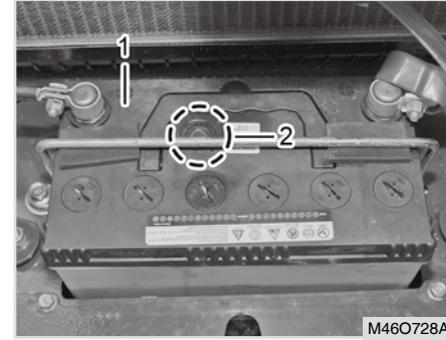
1. The battery cable should always be clean and firmly connected. When installing a new or used battery, clean its terminals and the end of the cable.

2. Check the electrolyte level and add distilled water if necessary.
3. Check the battery and cable for damage and corrosion.
4. Apply grease to the terminals and cable end in order to prevent corrosion.

⚠ WARNING

- ***The battery gas can explode. Do not expose the battery to flames or sparks. It may cause a fire.***
- ***The battery fluid contains sulfuric acid that can burn you. Do not allow the battery fluid to contact your eyes, skin, or painted surfaces. If you accidentally get it in your eyes or on your skin, flush the site of contact with water and contact your doctor.***
- ***Be sure to wear eye protection while working on the battery. The battery fluid can hurt your eyes.***
- ***Use only the battery with the specified voltage. Otherwise, it may cause a fire.***

BATTERY INSPECTION



(1) Battery

(2) Sight Glass

Check the battery sight glass frequently to keep the battery in the best condition.

-  Green: Battery normally charged
-  Black: Battery discharged, immediate charge required
-  White: Battery replacement required

**CHARGING**

1. While charging the battery, steam is generated from water in the electrolyte. If the amount of electrolyte is insufficient, the battery can be damaged. On the other hand, if the amount of electrolyte is excessive, the tractor can be damaged. Therefore, special care should be taken for the amount of electrolyte.
2. To slow charge the battery, connect the battery positive terminal to the charger positive terminal and the negative to the negative, and then recharge in the standard fashion.
3. Boost charging is only for emergencies. It will partially charge the battery at a high rate and in a short time. Failure to do this will shorten the battery's service life.
4. When the battery is discharged and should be replaced, replace it with a new one with same specification and capacity.

Battery type	Volts (v)
55AH	12


CAUTION

- **The charge warning lamp comes on if the charging system is defective. If it comes on while driving, have the system checked or repaired by your local KIOTI Dealer.**
- **Keep the battery fully charged. If the battery fluid concentration is too low during the winter sea-son, the battery may be frozen.**
- **Do not start the engine when the battery is frozen. Try to warm it up first.**
- **If the battery is not securely installed, the battery case and electrolytes could be damaged by vibration. To prevent the battery acid from contacting the terminals, apply grease around the battery terminals and connections.**


CAUTION

- **Never check the charge status of the battery by placing a metal object across the posts. Use a voltmeter or hydrometer.**



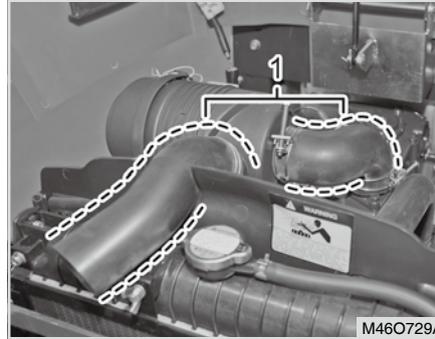
DIRECTION FOR STORAGE

1. When storing the tractor for a long period, remove the battery from tractor, store in a dry place out of direct sunlight.

2. The battery self-discharges while it is stored.

Recharge it once every three months in hot seasons and once every six months in cold seasons.

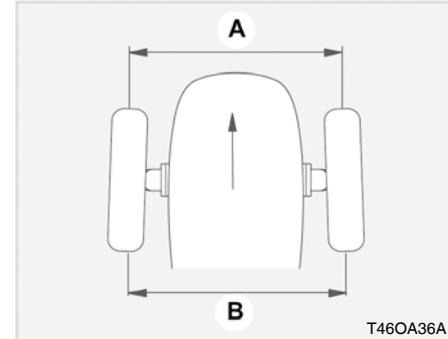
CHECKING INTAKE AIR LINE (X)



(1) Air Line Hose

1. If the hose clamps are loose, tighten clamps securely.
2. If the hoses and clamps are damaged, you must replace them at once. Failure to do so could lead to engine damage.

ADJUSTING TOE-IN (Y) ADJUSTING PROCEDURE



(A) Wheel - to - wheel distance at front

(B) Wheel - to - wheel distance at rear

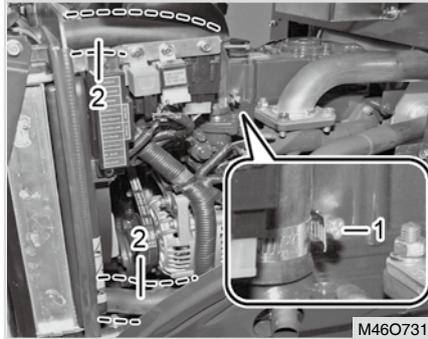
1. Park tractor on a flat level area.
2. Turn steering wheel so front wheels are pointed straight ahead.
3. Lower the implement, lock the parking brake and stop the engine.
4. Measure distance between tire beads (center) at front of tire and hub height.
5. Measure distance between tire beads at the rear of tire and hub height.
6. Front distance should be 0.08~0.31 in. (2~8 mm) less than rear distance. If not, adjust ball joint length.

**READJUSTMENT**

(1) Tie Rod Lock Nut

(2) Tie Rod

1. Loosen the lock nut and turn the turnbuckle to adjust the rod length until the proper toe-in measurement is obtained.
2. Check the toe-in value after the tie rod is adjusted.
3. Adjust it again if necessary.

CHECKING RADIATOR HOSE AND CLAMP (Z)

(1) Clamp

(2) Hose

Check to ensure the radiator hoses are free from damage and are tightened properly every 200 hours or every 6 months, whichever comes first.

1. If the hose clamps are loose or water leaks from hose, tighten clamps securely.
2. If the radiator hoses are swollen, hardened, cracked, or otherwise damaged, you must replace the hoses. Failure to do so could lead to coolant loss and engine damage.

It is a good practice to replace the radiator hoses every two years.

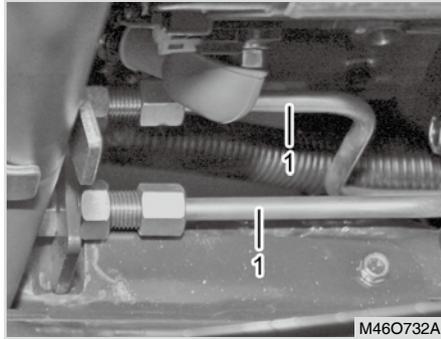
PRECAUTION AT OVERHEATING

Take the following actions in the event the coolant temperature reaches the boiling point, what is called "Over-heating".

1. Stop the machine in a safe place and keep the engine idling.
2. After 5 minutes of unloaded idling, shut the engine down.
3. Keep yourself away from the tractor for another 10 minutes or until steam has stopped blowing out of the engine.
4. Make sure that there is no danger and repair the cause of the overheating according to the manual's instruction. (Make sure to refer to "Engine troubleshooting" in chapter 8 before starting the engine)



POWER STEERING LINE (AA)



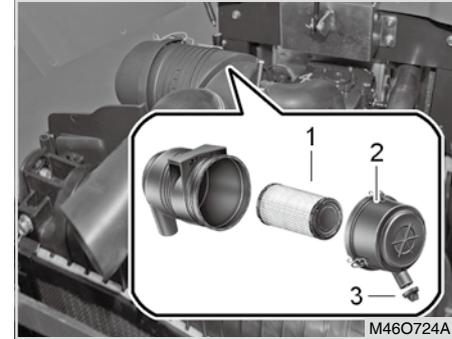
(1) Power Steering Oil Line

1. Check to see that all hydraulic lines and hose fittings are tighten and undamaged.
2. If damage is found you should replace the hose at once.

ADJUSTING ENGINE VALVE CLEARANCE (AE)

This service can be affected by the engine sensitively. Therefore, contact your local **KIOTI** Dealer for this service.

REPLACING AIR CLEANER FILTER (AF)



(1) Filter (2) Cap
(3) Evacuator Valve

If the air cleaner is not in good condition, the lifetime of the engine can be shortened, excessive soot can be produced, and the engine power can be deteriorated. Therefore, the filter should be inspected frequently. Its replacement interval can be changed according to driving conditions. Replace the filter according to the following procedure:

1. Open the hood and check the suction hose and air cleaner housing for damage.



2. Unscrew the air cleaner clip and remove the cover.
3. Clean the inside of the air cleaner housing by blowing compressed air through it.
4. Replace the filter and check the housing for damage.
5. Install the cover and fix it with the clip.

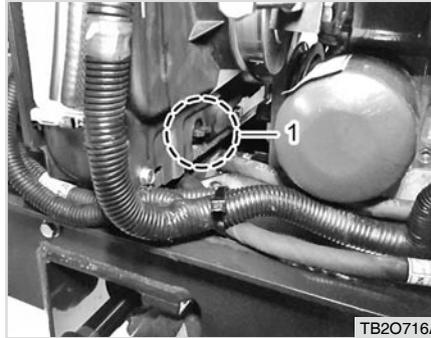
NOTE

- When installing the cover, make sure that the dust collection valve is heading downward.

CAUTION

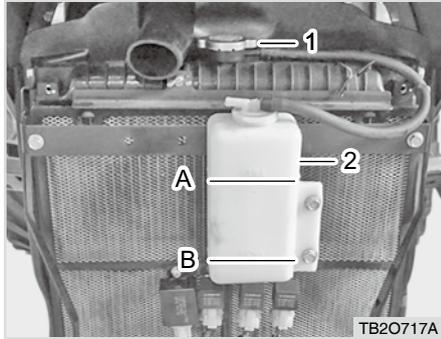
- **Use only a genuine KIOTI filter. Use of a non-recommended filter can cause damage to the engine and sensor.**
- **Make sure that no dust enters the system by installing the cover firmly.**
- **When removing the filter, be careful not to let foreign material enter the air inlet.**

FLUSH COOLING SYSTEM AND CHANGING COOLANT (AJ)



(1) Drain plug

4. Use clean, fresh water and anti-freeze to fill the reservoir tank.
 5. Follow the cleaner manufacturer's instruction.
1. Park the tractor on level ground, stop the engine and let the engine cool down.
 2. To drain coolant, remove the drain plug from the radiator and turn the radiator cap to the 1st notch to release pressure in the radiator. Then, remove the cap completely.
 3. After all coolant is drained, fit the drain plug.



(1) Radiator cap
(A) FULL
(2) Reservoir tank
(B) LOW

6. Install the radiator cap securely.
7. Start and idle the engine for few minutes.
8. Stop the engine and let it cool.
9. Drain water and cooling system cleaner and close drain cock. Then, fill with antifreeze and water mixture and close radiator cap securely.
10. Run tractor at idle until up to operating temperature.

11. Check the coolant level in the reservoir tank. If the level is low, add coolant.

Coolant capacity
0.87 U.S.gal. (3.3 L)

⚠ CAUTION

To avoid accidents:

- Do not remove the radiator cap while the coolant is hot. Steam or scalding liquids released from hot cooling system can burn you seriously. Cool down the engine first.
- Even though the coolant is cooled down, turn the cap to its first stop and then wait until it is depressurized before removing the cap completely.

⊕ IMPORTANT

- Do not start engine without coolant.
- Use clean, fresh water and anti-freeze to fill the radiator and reservoir tank.
- When the anti-freeze is mixed with water, the anti-freeze mixing ratio must be no less than 50% mixture of water and anti-freeze.
- Securely tighten radiator cap. If the cap is loose or improperly fitted, water may leak out and the engine could over-heat.
- If the radiator cap has to be removed, follow the caution above and securely retighten the cap.
- Use clean, fresh water and anti-freeze to fill the reservoir tank.
- If the coolant leaks, contact your local KIOTI Dealer.



ANTI-FREEZE

This tractor is filled with 50% of ethylene glycol at factory.

If the anti-freeze has been replaced by tap water later on, the coolant can be frozen, leading to damage to the cylinder and radiator when the ambient temperature is below 0°C.

Therefore, make sure to change water into anti-freeze before winter season comes.

When changing the anti-freeze with one of another type, flush the cooling system several times and contact a professional for the mixture ratio.

Vol. % Anti-freeze	Freezing Point		Boiling Point*	
	°F	°C	°F	°C
40	-12	-24	222	106
50	-34	-37	226	108

- * At 760 mmHg pressure (atmospheric). A higher boiling point is obtained by using a radiator pressure cap.

NOTE

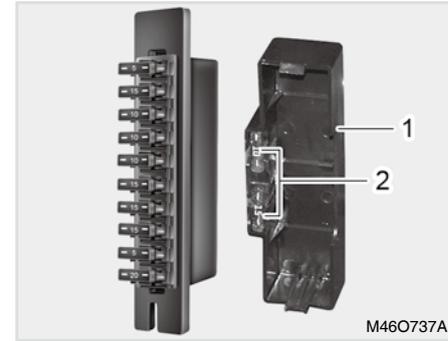
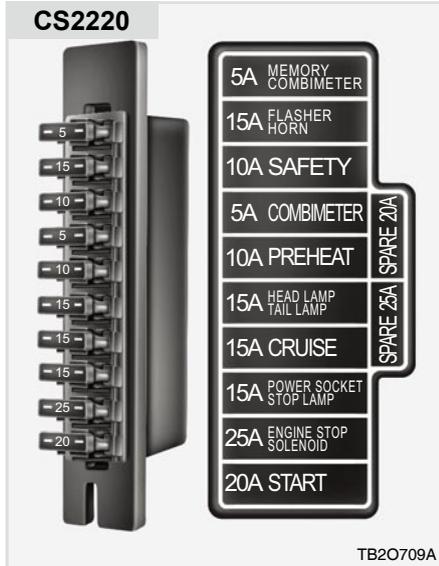
- The temperatures shown on the left are industry standards that necessitate a minimum glycol content in the concentrated anti-freeze.
- When the coolant level drops due to evaporation, add water only. In case of leakage, add anti-freeze and water in the specified mixing ratio.
- Anti-freeze absorbs moisture. Keep unused anti-freeze in a tightly sealed container.
- Do not use radiator cleaning agents when anti-freeze has been added to the cooling water. (Anti-freeze contains an anti-corrosive agent, which will react with the radiator cleaning agent forming sludge which will affect the engine parts)

REPLACING FUSE (AN)



(1) Fuse Box

Fuses protect the tractor electrical system from potential damage. A blown fuse indicates that there is an overload or short somewhere in the electrical system.

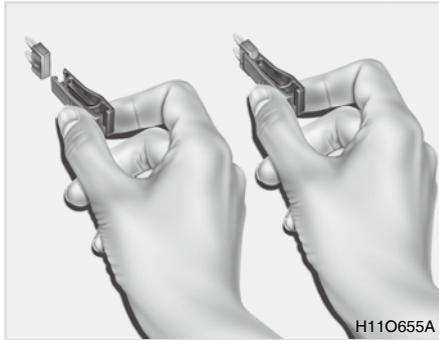


(1) Fuse Storage Case (2) Fuse

Fuse panel is located under the right side of the instrument panel.

There are marks indicating the fuse capacity and location on the cover of the fuse panel. Replace the fuse according to the following procedure:

1. Turn the key switch to the "OFF" position and turn "OFF" all the electrical devices.
2. Open the fuse box cover and check the fuse in question using fuse tongs.



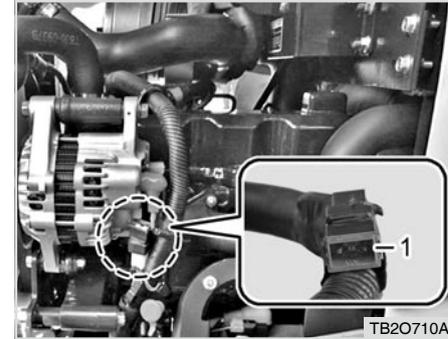
3. If the fuse is blown, replace it with a new fuse with same capacity. Make sure it is firmly installed.
4. Install the fuse box cover.

⚠ WARNING

- *Never use a fuse with the capacity higher than specified on the fuse box cover.*
- *If using a faulty fuse, steel wire, or foil, the electrical device can be damaged or even can catch a fire.*

📖 NOTE

- **If the replaced fuse blow, it is probable that the wiring system is faulty. In this case, contact your local KIOTI Dealer.**
- **If the fusible link, relay or other electrical component is faulty, contact your local KIOTI Dealer.**

SLOW BLOW FUSE (AP)

(1) Slow Blow Fuse

The slow blow fuse is to protect the electric wiring. If it is blown, find and repair the cause and replace it with a new genuine **KIOTI** part.

Slow blow fuse	
CS2220H	60 A
CS2520H	80 A



⊕ IMPORTANT

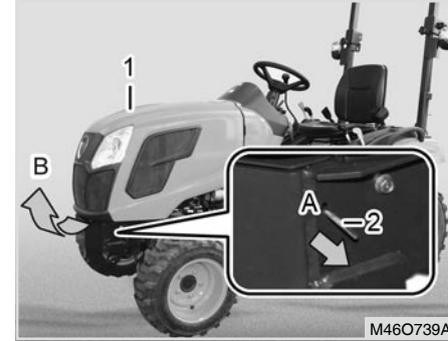
- Using a non-approved slow-blow fuse can damage electrical systems in the tractor severely.
- Refer to the chapter "Troubleshooting" in this manual or contact your local KIOTI Dealer for specific information dealing with electrical problems.

REPLACING BULB (AQ)

The bulb and capacity used in this tractor are listed in the blow table.

No.	Bulb	Capacity
1	Head lamp	12V 55W
2	Turn signal lamp	12V 21W

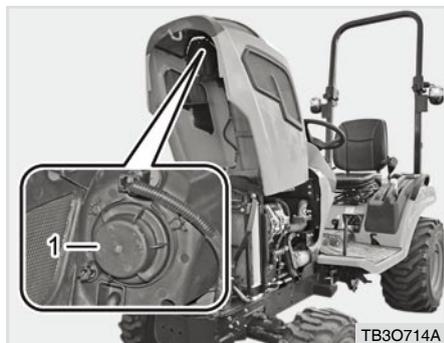
HEAD LAMP



(1) Handle
(A) Pull

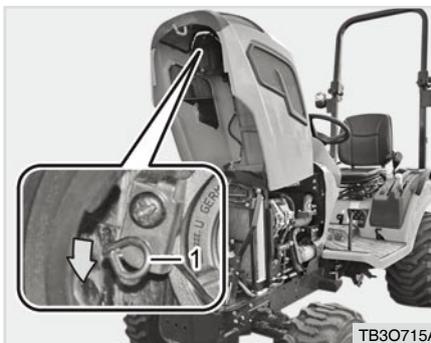
(2) Handle
(B) Open

1. Turn the key switch to the "OFF" position and open the hood.



(1) Cover

2. Disconnect the connector.
3. Open the cover.



(1) Spring

4. Turn the spring counterclockwise to remove the bulb and replace it with a new one.
5. Installation is carried out in reverse order of removal.

WARNING

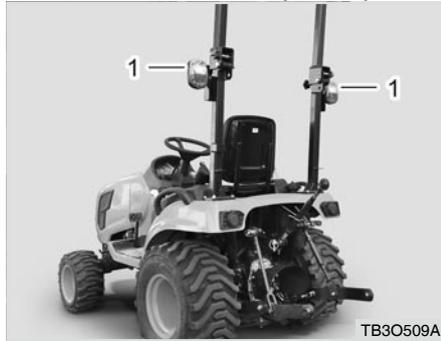
- If using a bulb other than the specified one, the lamp can be damaged and the tractor can even catch fire.
- Make sure to use bulbs with the specified capacity.

CAUTION

- Make sure to use a genuine bulb. Using a non-recommended bulb can cause a fire.
- The head lamps can temporarily be fogged due to rain or car wash. This is because of the temperature difference between the inside and outside of the lamp, which is normal.

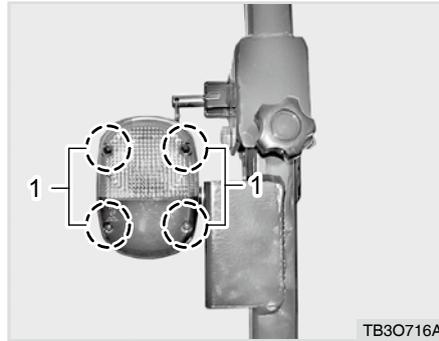


TURN SIGNAL LAMP (REAR)



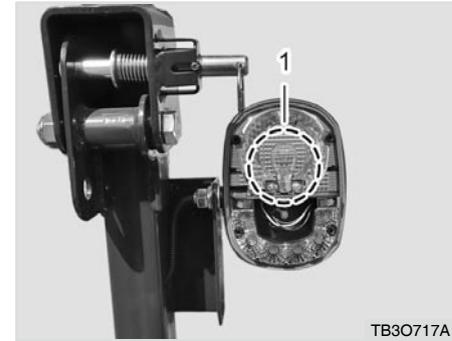
(1) Turn Signal Lamp

1. The turn signal lamp is installed on the ROPS.



(1) Bolt

2. Unscrew the lens mounting bolt to remove the lens.



(1) Turn Signal Lamp Bulb

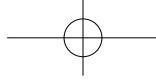
3. With the bulb pressed downward, turn it counterclockwise to remove it. Replace it with a new one.

**⚠ CAUTION**

- Do not touch the bulb if it is still illuminated or right after it is turned "OFF". You can be burned by the hot bulb.
- For some bulbs which require delicate handling or work process, contact your local KIOTI Dealer.
- Do not touch the illuminating glass part of the halogen bulb. The bulb life can be shortened by finger prints, dust and moisture, or the bulb even can be broken. Clean it with soft cloth.
- The halogen bulb contains compressed gas, so it can explode if dropping or scratching it. Therefore, never use a bulb if it is scratched or was dropped.

⚠ CAUTION

- When separating the cover by prying it "OFF" with a screwdriver, be careful not to damage it.
- Before replacing a bulb, make sure to put the key switch and the switch for the corresponding bulb to the "OFF" position.
- Install a new bulb with the same capacity after removing the installed bulb.



MEMO





STORAGE AND DISPOSAL

TRACTOR STORAGE 8-2

 DAILY STORAGE8-2

 LONG-TERM STORAGE.....8-2

USING TRACTOR AFTER STORAGE 8-3

USAGE AND DISPOSAL..... 8-4

8

8



TRACTOR STORAGE DAILY STORAGE

1. Keep the tractor clean when it is stored. Make sure to wash it after work.
2. Store it indoors if possible. If it should be kept outside, cover it.

WARNING

- *When operating the tractor in an enclosed area, ventilate the area to release exhaust gas to the outside. The exhaust gas is colorless and not visible, but is harmful.*

3. Remove the battery from the tractor in winter and store it indoors.
4. Add anti-freeze to the tractor in winter season in order to prevent the radiator from freezing.
5. Remove the ignition key and store it separately.

LONG-TERM STORAGE

Follow the instructions below if the tractor is not to be used for a long period of time (max. 1 year). This is to operate the tractor again with minimum preparation after long-term storage. Repeat this procedure if the tractor hasn't been used for one year.

IMPORTANT

- **If the tractor is not used for an extended period of time, follow the instructions below to prevent corrosion and performance deterioration of the tractor while it is stored.**

1. Check the bolts and nuts for looseness, and tighten if necessary.
2. Apply grease to tractor areas where bare metal will rust also to pivot areas.
3. Detach the weights from the tractor body.

4. Inflate the tires to a pressure a little higher than usual.
5. Change the engine oil and run the engine to circulate oil throughout the engine parts for about 5 minutes.
6. With all implements lowered to the ground, coat any exposed hydraulic cylinder piston rods with grease.
7. Remove the battery from the tractor. Store the battery following the battery storage procedures. (See section "Battery" in the chapter 7 "maintenance")
8. Keep the tractor in a dry place where the tractor is sheltered from rain. Cover the tractor.
9. Clean the engine components as well as the tractor.
10. Add grease to all the lubrication filler ports of the tractor.
11. Replace any worn or damaged component.



12. If a loader or implement is installed, lower it onto level ground.
13. Apply grease to the exposed cylinder rod.
14. Wash the cooling system and drain water from it. Also, add anti-freeze.
15. Replace all the oil and filters.
16. Replace the air cleaner filter.
17. Chock the frame in order to remove the weight from the tires.
18. Set all control systems to neutral position.
19. Plug any open exhaust pipes.
20. Attach a tag onto the tractor to inform the storage condition of the tractor.

**CAUTION****To avoid injury:**

- **Never clean the tractor body while the engine is running.**
- **Never run the engine in an enclosed area without proper ventilation system in order to prevent poisoning by exhaust gas.**
- **When storing the tractor, remove the key from the switch and store it separately in order to prevent an unauthorized person from operating the tractor and being injured.**
- **Cover the tractor after the muffler and the engine have cooled down.**
- **If the battery is not to be removed, disconnect its negative terminal. The wiring can be gnawed by rodents, leading to a fire.**

USING TRACTOR AFTER STORAGE

1. Check the tire air pressure and inflate the tires if they are low.
2. Install a fully charged battery.
3. Check the fan belt tension.
4. Check all fluid levels. (Engine oil, transmission/hydraulic oil, engine coolant and any attached implements)
5. Remove grease from the exposed cylinder rod.
6. Apply grease to the lubrication points.
7. Get onto the tractor and start the engine.
8. Check if the instrument panel and all parts operate correctly while running the engine for a few minutes.
9. Drive the tractor outside and check if it is operating properly. Park the tractor outside and idle engine for at least 5 minutes. Stop the engine and visually inspect the tractor. Check if there is leakage.



USAGE AND DISPOSAL

10. Start the engine, release the parking brake, and check the brake condition while driving forward. Adjust the brake pedals if necessary.
11. Stop the engine and check for leakage. Repair any part as required.

CAUTION

- **If the battery is not to be removed, disconnect its negative terminal at least. The wiring can be gnawed by rodents, leading to a fire.**

In order to protect the environment, use and dispose of the tractor keeping the following in mind:

1. When changing the oil or coolant by yourself, be careful not to spill it. Dispose of used oil and coolant properly according to the applicable regulations.
2. Never leave or discard the expired tractor or implement without discretion on your own, but contact your local **KIOTI** Dealer to dispose it according to the regulations.
3. Avoid working under high load, as it can cause excessive exhaust gases, which is harmful to the environment.



TROUBLESHOOTING

ENGINE TROUBLESHOOTING 9-2
TRACTOR TROUBLESHOOTING 9-4

9

9



This troubleshooting chart summarizes simple service items for users who are familiar with mechanical systems. For more detailed service items, contact your local **KIOTI** Dealer.

ENGINE TROUBLESHOOTING

CAUSE	COUNTERMEASURES	
<p>1. When engine is difficult to start</p>	<ul style="list-style-type: none"> • Fuel is thick and doesn't flow. 	
	<ul style="list-style-type: none"> • Check the fuel tank and fuel filter. • Remove water, dirt and other impurities. • All fuel will be filtered by the filter, if there should be water of other foreign material on the filter, replace the filter. 	
	<ul style="list-style-type: none"> • Air or water mixed in fuel system. 	<ul style="list-style-type: none"> • If air is in the fuel filter or injection lines, the fuel pump will not work properly. • To attain proper fuel injection pressure, check carefully for loosened fuel cap nut, etc. • Loosen air vent screw over fuel filter and fuel injection pump to eliminate all the air in the fuel system.
	<ul style="list-style-type: none"> • Thick carbon deposits on orifice of injection nozzle. 	<ul style="list-style-type: none"> • This is caused when water or dirt is mixed in the fuel. Clean the nozzle injection piece, being careful not to damage the orifice. • Check to see if nozzle is working properly or not, if not, install a new nozzle.
	<ul style="list-style-type: none"> • Valve clearance is wrong 	<ul style="list-style-type: none"> • Contact KIOTI dealer.
	<ul style="list-style-type: none"> • Engine oil become thick in cold weather and engine cranks slow. 	<ul style="list-style-type: none"> • Change grade of oil according to the weather (temperature).
	<ul style="list-style-type: none"> • Actuator driver malfunction 	<ul style="list-style-type: none"> • Check the actuator and wire connection
	<ul style="list-style-type: none"> • Speed sensor malfunction 	<ul style="list-style-type: none"> • Check the speed sensor and wire connection. Adjust the air gap between ring gear and the tip of sensor



CAUSE		COUNTERMEASURES						
1. When engine is difficult to start	<ul style="list-style-type: none"> Start motor does not rotate when key switch is turned 	<ul style="list-style-type: none"> Depress the clutch pedal unless depressed (Manual type). Put the P.T.O switch to the "OFF" position. If the switch or start motor is faulty, have it repaired in a workshop. If any terminal is loose or corroded, clean or fix it firmly. 						
2. When output is insufficient	<ul style="list-style-type: none"> Valve out of adjustment Air cleaner is dirty Fuel injection pressure is wrong Pressure sensor malfunction Speed sensor malfunction Actuator position sensor malfunction 	<ul style="list-style-type: none"> Contact KIOTI dealer. Clean or replace the element at every 100 to 200 hours of operation. Contact KIOTI dealer. Check the sensor wire connection and resistance. Check the sensor wire connection. Check the actuator and wire connection. 						
3. When color of exhaust is specially bad	<ul style="list-style-type: none"> Fuel is of extremely poor quality Nozzle is bad 	<ul style="list-style-type: none"> Select good quality fuel. <table border="0"> <tr> <td>Temperature</td> <td>Fuel type</td> </tr> <tr> <td>- Above 14°F (-10°C)</td> <td>NO.2 Diesel</td> </tr> <tr> <td>- Below 14°F (-10°C)</td> <td>NO.1 Diesel</td> </tr> </table> If necessary, replace with new nozzle. 	Temperature	Fuel type	- Above 14°F (-10°C)	NO.2 Diesel	- Below 14°F (-10°C)	NO.1 Diesel
Temperature	Fuel type							
- Above 14°F (-10°C)	NO.2 Diesel							
- Below 14°F (-10°C)	NO.1 Diesel							

※ If you do not find the cause of trouble, consult your **KIOTI** dealer for assistance.



TRACTOR TROUBLESHOOTING

CAUSE		COUNTERMEASURES
1. When tractor does not move while engine is running	• Shift lever is in neutral position	• Check the shift levers.
	• Parking brake is applied	• Release the parking brake.
2. Brake is not operating properly	• Brake does not operate or only one brake pedal operates	• The brake pedal play is excessive. Adjust the play. • The brake lining is worn or stuck. Have it replaced in a workshop.
	• Brake pedal does not return properly	• The brake return spring is damaged. Replace it. • Grease is insufficient on each mating surface. Remove rust and apply grease.
	• Steering wheel is heavy or vibrate	• The toe-in is incorrect. Adjust it again. • The tire inflation pressure is different. Inflate the left and right tires into the specified pressure. • Each connection is loose. Re-tighten each connection and replace the part.
3. Steering wheel is not operating properly	• Steering wheel play is excessive	• The steering wheel shaft is worn. Have it repaired in a workshop. • Metal parts are worn. Have them repaired in a workshop. • Each connection has play. Tighten the connection again.

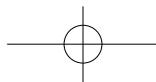


CAUSE		COUNTERMEASURES
4. Hydraulic system is faulty	<ul style="list-style-type: none"> Oil is leaked from pipe or hose 	<ul style="list-style-type: none"> The pipe clamp is loose. Re-tighten it. The pipe is cracked. Have it repaired in a workshop.
	<ul style="list-style-type: none"> 3-point hitch cannot be lowered 	<ul style="list-style-type: none"> 3-point hitch safety lock function activated, one touch button pressed The valve and cylinder are damaged. Contact KIOTI dealer.
	<ul style="list-style-type: none"> 3-point hitch cannot be lifted 	<ul style="list-style-type: none"> The transmission fluid is insufficient. Add it to the specified level.
		<ul style="list-style-type: none"> There is air in the intake pipe. Bleed the pipe.
		<ul style="list-style-type: none"> The oil filter is clogged. Replace it.
	<ul style="list-style-type: none"> The hydraulic filter, valve and cylinder are malfunctioning. Contact KIOTI dealer. 	
	<ul style="list-style-type: none"> 3-point hitch vibrates by itself 	<ul style="list-style-type: none"> Each sensor malfunctioning, Contact KIOTI dealer. Select the highest top link hole.
5. Electric system is faulty	<ul style="list-style-type: none"> Headlamps cannot be turned on or are dim. 	<ul style="list-style-type: none"> The fuse is blown. Check the wiring and replace the fuse.
		<ul style="list-style-type: none"> The bulb is blown. Replace it
		<ul style="list-style-type: none"> The ground and terminal wirings are poorly contacted. Check and clean them.
		<ul style="list-style-type: none"> The battery electrolyte level is low. Charge the battery.



CAUSE		COUNTERMEASURES
5. Electric system is faulty	• Battery cannot be charged	• Check the battery and alternator.
	• Horn does not sound	• The horn switch is faulty. Replace or see KIOTI dealer.
		• The wiring is faulty. Replace or See KIOTI dealer.
		• The horn is damaged. Repair or replace it.
	• Turn signal lamps do not blink	• The bulb is blown. Replace it.
		• The blinking device is faulty. Repair or replace it.
		• The ground and terminal wirings are poorly contacted. Check and clean them.
	• Work lamps do not come on	• The bulb is blown. Replace it.
		• The ground and terminal wirings are poorly contacted. Check and clean them.

※ If you do not find the cause of trouble, consult your dealer for assistance.





INDEX

INDEX..... 10-2

10

10



NUMERIC

3-POINT HITCH CONTROL SYSTEM5-22
 3-POINT HITCH IMPLEMENT AND LOADER OPERATION..... 6-1

A

ACCESSORY SYSTEM4-26
 ADDITIONAL FRONT WEIGHT4-30
 ADDITIONAL LIQUID TYPE WEIGHT4-31
 ADDITIONAL WEIGHT (OPTIONAL)4-30
 ADJUSTING PROCEDURE7-29
 ADJUSTING BRAKE PEDAL (O).....7-19
 ADJUSTING ENGINE VALVE CLEARANCE (AE)7-30
 ADJUSTING FAN BELT TENSION (V).....7-25
 ADJUSTING TOE-IN (Y)7-29
 ADJUSTMENT OF LIFT ROD6-6
 ADJUSTMENT OF STABILIZER6-7
 ADJUSTMENT OF TOP LINK6-7
 ANTI-FREEZE7-33
 AUXILIARY PORT (OPTIONAL)4-25

B

BATTERY (W).....7-26
 BATTERY CHARGING LAMP4-13
 BATTERY INSPECTION7-27

BELTS AND RUBBER PARTS2-5
 BLEEDING FUEL SYSTEM (AK)7-23
 BRAKE PEDAL.....4-16

C

CAUTIONS CONCERNING PAVED ROAD5-18
 CAUTIONS FOR DECAL MAINTENANCE1-29
 CHANGING ENGINE OIL AND REPLACING FILTER (L) ..7-14
 CHANGING FRONT AXLE CASE OIL (N)7-18
 CHECKING AND ADDING FUEL (C)7-9
 CHECKING BRAKE PEDALS (H)7-13
 CHECKING COOLANT LEVEL (F).....7-12
 CHECKING ENGINE OIL LEVEL (E)7-11
 CHECKING FUEL LINES (U)7-22
 CHECKING GAUGES, METER AND EASY CHECK LAMPS (I).....7-13
 CHECKING HEAD LIGHT, HAZARD LIGHT ETC. (J).....7-13
 CHECKING INJECTION NOZZLE AND FUEL INJECTION PUMP7-25
 CHECKING INTAKE AIR LINE (X)7-28
 CHECKING RADIATOR HOSE AND CLAMP (Z).....7-29
 CHECKING SEAT BELT AND ROPS (K)7-13
 CHECKING TRANSMISSION FLUID LEVEL (D).....7-10
 CHECKING WHEEL BOLT/NUT TORQUE (Q).....7-21



CLEANING GRILL, RADIATOR SCREEN (G)	7-13
COMBINATION SWITCH	4-7
COMPONENTS FOR ADDITIONAL FRONT WEIGHT	4-30
CONNECTING AND DISCONNECTING IMPLEMENT HYDRAULIC HOSE	5-25
CRUISE LAMP (OPTIONAL).....	4-14
CRUISE OPERATION SWITCH (OPTIONAL)	4-9
CUP HOLDER	4-26
CUTTING HEIGHT ADJUSTMENT LEVER	4-21

D

DAILY CHECK CHART.....	7-2
DAILY STORAGE.....	8-2
DECAL MOUNTING LOCATION	1-25
DECALS	1-26
DESCRIPTION OF OPERATING SYSTEM	4-1
DIFFERENTIAL LOCK PEDAL.....	4-19
DOUBLE ACTING LEVER (OPTIONAL).....	4-24
DOUBLE ACTING VALVE LEVER	5-23
DRAFT HITCH AND TRAILER	6-8
DRIVING.....	5-11
DRIVING ON SLOPE	5-17
DRIVING ON SLOPE	6-12

E

ENGINE CHECK LAMPS	5-7
ENGINE COOLANT TEMPERATURE GAUGE.....	4-12
ENGINE NUMBER	2-2
ENGINE OIL PRESSURE WARNING LAMP	4-12
ENGINE TROUBLESHOOTING.....	9-2
ESSENTIAL REPLACEMENT PARTS	2-4
EXTERIOR HYDRAULIC CONTROL SYSTEM (OP- TIONAL).....	5-23
EXTERIOR VIEW	4-3
EXTERNAL DIMENSIONS	3-2

F

FILTERS	2-4
FIXATION POINTS FOR ATTACHMENT	6-14
FLUSH COOLING SYSTEM AND CHANGING COOL- ANT (AJ)	7-31
FOLDING THE ROPS	5-13
FORWARD/REVERSE DRIVING PEDALS.....	4-18
FRONT WHEEL DRIVE LEVER.....	4-17
FUEL GAUGE	4-11

G

GENERAL PRECAUTIONS	1-2
---------------------------	-----



G

GENERAL SPECIFICATIONS.....3-2
 GLOW PLUG INDICATOR4-14

H

HAND THROTTLE LEVER.....4-18
 HANDLING LOADER6-11
 HAZARD LAMP SWITCH.....4-8
 HEAD LAMP.....7-37
 HEAD LIGHT SWITCH.....4-7
 HORN SWITCH.....4-8
 HOW TO DISCONNECT THE HOOD (A)7-8
 HOW TO USE6-5
 HST RANGE GEAR SHIFT LEVER4-16
 HYDRAULIC SYSTEM.....4-23

I

IMPLEMENT LIMITATIONS.....3-9
 INDEX.....10-1
 INFLATION PRESSURE4-28
 INITIAL OPERATION.....5-3
 INSTALLING PTO SHAFT.....6-9
 INSTRUMENT PANEL.....4-10

J

JOYSTICK LEVER6-15
 JOYSTICK VALVE PORT6-18
 JUMP STARTING THE ENGINE5-10

K

KEY SWITCH4-4

L

LIFTING ARM (LOWER LINK) SPEED CONTROL LEVER.....4-24
 LOADING INTO AND UNLOADING OUT OF THE TRUCK.....5-19
 LONG-TERM STORAGE8-2
 LUBRICANTS.....7-7
 LUBRICATING GREASE FITTINGS (P)7-20

M

MAINTENANCE7-1
 MAINTENANCE CHECK LIST7-2
 MAINTENANCE CODE.....7-8
 MAINTENANCE SCHEDULE CHART7-3
 MAJOR SPECIFICATIONS3-3
 MOUNTING LOCATION.....4-4
 MOWER IMPLEMENT6-2

**N**

NOISE LEVELS AS PERCEIVED BY THE OPERATOR.....3-7

O

OILS AND FLUIDS2-4

OPENING SIDE COVER (B).....7-8

OPERATING THE CONTROLS4-15

OPERATING THE ENGINE.....5-3

OPERATING THE TRACTOR.....5-11

OPERATION.....5-1

OPERATION TIP FOR 3-POINT HITCH ELEMENTS6-6

OPTION LIST3-6

OTHER COMPONENTS2-5

P

PARKING.....5-15

PARKING BRAKE LEVER4-17

PARKING WITH LOADER INSTALLED6-13

POSITION CONTROL.....5-22

POSITION CONTROL LEVER4-23

POWER SOCKET & USB CHARGE4-26

POWER STEERING LINE (AA)7-30

POWER STEERING PRECAUTIONS.....5-20

PRECAUTIONS BEFORE OPERATION.....1-2

PRECAUTIONS BEFORE OPERATION.....2-1

PRECAUTIONS DURING OPERATION1-8

PRECAUTIONS FOR HANDLING7-26

PRECAUTIONS WHILE DRIVING ON THE ROAD5-18

PRE-OPERATION5-2

PRODUCTION NUMBER.....2-2

PTO SHAFT COVER & CAP4-25

PTO SHIFT LEVER4-20

PTO SWITCH (ON / OFF).....4-20

R

RAISING THE ROPS TO UPRIGHT POSITION5-14

READJUSTMENT7-29

REMOVAL AND INSTALLATION OF 3-POINT HITCH
IMPLEMENT (WITH P.T.O SHAFT)6-2

REPLACING AIR CLEANER FILTER (AF)7-31

REPLACING AIR CLEANER PRIMARY ELEMENT (T)7-21

REPLACING BULB (AQ).....7-36

REPLACING FUSE (AN).....7-34

REPLACING TRANSMISSION FLUID AND FILTER (M) ...7-16

S

SAFETY DECAL MAINTENANCE.....1-25

SAFETY LOCK FUNCTION (WHILE VEHICLE IS STA-
TIONARY).....5-3



S

SAFETY PRECAUTIONS.....1-1
 SAFETY PRECAUTIONS DURING SERVICING.....1-15
 SAFETY PRECAUTIONS WHEN USING THE LOADER ..1-19
 SEAT ADJUSTMENT.....4-22
 SEAT BELT.....4-22
 SEAT SLIDING4-22
 SINGLE ACTING AND DOUBLE ACTING CYLINDER5-24
 SLOW BLOW FUSE (AP).....7-36
 SPECIFICATIONS.....3-1
 STANDARD IMPLEMENT DIMENSIONS3-9
 STARTING THE ENGINE.....5-3
 STOPPING THE ENGINE5-8
 STORAGE AND DISPOSAL.....8-1

T

TACHOMETER/HOUR METER INDICATOR4-11
 TIPS FOR BREAKING-IN.....5-3
 TIRES, WHEELS AND BALLAST.....4-27
 TOOL BOX4-27
 TRACTOR STORAGE.....8-2
 TRACTOR TROUBLESHOOTING9-4
 TRANSMISSION NUMBER.....2-2
 TREAD4-29

TROUBLESHOOTING9-1
 TURN SIGNAL LAMP.....4-13
 TURN SIGNAL LAMP (REAR)7-38
 TURN SIGNAL LIGHT SWITCH.....4-8
 TURNING5-17

U

USAGE AND DISPOSAL.....8-4
 USING TRACTOR AFTER STORAGE.....8-3

V

VEHICLE IDENTIFICATION NUMBER2-2
 VIBRATION LEVELS OF THE TRACTOR EXPOSITION
 TO VIBRATIONS.....3-7
 VIEW4-10

W

WARMING UP5-9
 WHEEL BOLT AND NUT TORQUE4-29
 WHEEL TORQUE AND DIRECTION4-29
 WHEN DRIVING THE TRACTOR1-12
 WHEN LOADED BUCKET AND REAR BALLAST ARE
 INSTALLED6-12
 WHEN OPERATING THE P.T.O.....1-14

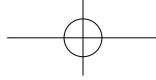


WHEN PARKING THE TRACTOR1-13

WHEN STARTING THE ENGINE.....1-8

WHEN UNLOADED BUCKET AND REAR BALLAST
ARE INSTALLED6-12

WHEN USING THE 3-POINT HITCH.....1-15



 **WARNING**

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel

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