MASSEY FERGUSON

OPERATOR'S MANUAL

MF 1GC.00

MF 1GC.23, MF 1GC.25

Beauvais
AGCO S.A.S
2 Rue Charles Tellier, 60000 BEAUVAIS, France
RC B562 104 539

November 2024 | ORIGINAL OPERATOR'S MANUAL | ACX4949280 | NA | English

MASSEY FERGUSON

CALIFORNIA

Proposition 65 Warning

WARNING: Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, or other reproductive harm.

WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling.

Congratulations on your selection of an AGCO® product. We believe you have exercised excellent judgment in the purchase of your AGCO® machine. We are most appreciative of your patronage.

Your AGCO® dealer has performed the pre-delivery service on your new machine.

Your AGCO® dealer will discuss with you the operating and maintenance instructions given in this manual, and instruct you in the correct and varied applications of this machine. Call on them at any time when you have a question or need equipment related to the use of your machine.

We recommend that you carefully read this entire manual before operating the machine. Also, time spent in becoming fully acquainted with its performance features, adjustments, and maintenance schedules will be repaid in a long and satisfactory life of the product.

This equipment is covered by a written warranty which will be provided to you by your AGCO® dealer at time of purchase.

AGCO® reserves the right to make changes or add improvements to its products at any time without incurring any obligation to make such changes to products manufactured previously. AGCO®, or its dealers, accept no responsibility for variations which may be evident in the actual specifications of its products and the statements and descriptions contained in this publication.

Series Compact Tractors

1 Safety 13

1.1 Introduction 15

1.1.1 Safety symbol 15
1.1.2 Safety messages 15
1.1.3 Messages 15
1.1.4 Safety signs 15
1.1.5 A word to the operator 16
1.1.6 This manual 16

1.2 Operation 17

1.2.1 Prepare for operation 17
1.2.2 Roll over protective structure 17
1.2.3 General information 17
1.2.4 Personal protective equipment 20
1.2.5 Seat instruction 21
1.2.6 Shield and guards 21
1.2.7 Power take-off safety 22
1.2.8 Exhaust warning 22
1.2.9 Flying debris 23
1.2.10 The agricultural chemicals 23

1.3 Travel on public roads 24

1.4 Maintenance 25

1.4.1 General maintenance information 25
1.4.2 Prevent fire and first aid 26
1.4.3 High pressure leaks 26
1.4.4 Engine safety 27
1.4.5 Fuel safety 29
1.4.6 Battery safety 29
1.4.7 Tire safety 30
1.4.8 Replacement parts 30
1.4.9 Weld on the machine precautions 30

1.5 Safety and informational signs 31

1.5.1 Safety and informational signs location 31
1.5.2 Safety signs description 32
1.5.3 Warning - state of California 32
1.5.4 Electrical hazard 32
1.5.5 Hot surface 32
1.5.6 Hot pressurized coolant 33
1.5.7 Entanglement hazard - belt 33
1.5.8 Explosion and/or fire hazard - starting fluid 33
1.5.9 Shear hazard - engine fan 33
1.5.10 Run over hazard 34
1.5.11 Fuel 34
1.5.12 Flammable fuel 34

1.5.13 Roll-over hazard (only for ROPS model) 34
1.5.14 Roll-over crush hazard (only for TLB model) 35
1.5.15 Operators manual 35
1.5.16 Shut off engine 35
1.5.17 Movement hazard 35
1.5.18 Crush hazard 36
1.5.19 Roll-over crush hazard - slope 36
1.5.20 Fall off or run-over hazard 36
1.5.21 Entanglement hazard - power take-off 36
1.5.22 Rear rollover hazard 37
1.5.23 Component separation flying object 37

2 Introduction 39

2.1 Introduction 41
2.1.1 Intended use 41
2.1.2 How to correctly discard the waste 41

2.2 Identification of the machine 42
2.2.1 Identification of the machine 42
2.2.2 Serial number plate 42
2.2.3 Engine identification 43
2.2.4 Chassis number 43

2.3 Machine components 44

2.4 California emission control warranty statement 45

2.5 United States and Canada emission control warranty statement 46

3 Operation 49

3.1 Machine operation controls 51
3.1.1 Locations of controls 51

3.2 Instrument panel and components 52
3.2.1 Instrument panel 52
3.2.1.1 Indicators and gauges 53
3.2.2 Ignition switch 55
3.2.3 Lamp switches 55

3.3 Brake pedal and parking brake 56

3.4 Seat 57
3.4.1 Adjust the seat 57
3.4.2 Rotate the seat for backhoe operation (only for TLB models) 57
3.4.3 Rotate the seat for tractor operation 59

3.5 Steering wheel 62
3.5.1 Adjust the steering wheel tilt 62
3.5.2 Adjust the steering wheel tilt lever 62

3.6 Electrical power outlet - 12V socket 64

3.7 Aux. power outlet 65

3.8 Engine cover 66
3.8.1 Open the engine cover 66

3.9 Break-in the tractor 67

3.10 Start the tractor 68
3.10.1 Examine before operation 68
3.10.2 Start the tractor - normal conditions 69

3.10.3 Cold weather starting ... 70
3.10.4 Warm engine starting ... 70
3.10.5 Warm up period ... 70
3.10.6 General operating information ... 71
3.10.7 Examine the neutral start system ... 71
3.11 Engine speed control ... 73
3.12 Ground speed controls ... 74
3.12.1 Range gear shift lever ... 74
3.12.2 Hydrostatic pedals ... 74
3.12.3 Ground speed chart ... 74
3.12.4 Set the cruise control lever ... 75
3.13 Stop the engine ... 77
3.14 Engage the differential lock ... 78
3.15 Four-wheel drive ... 79
3.16 Power take-off ... 80
3.16.1 Power take-off controls ... 80
3.16.2 Rear power take-off shaft ... 81
3.16.3 Mid power take-off shaft ... 82
3.17 3-point linkage ... 83
3.17.1 3-point linkage controls ... 83
3.17.2 Linkage assembly ... 85
3.17.3 Connect implements ... 85
3.17.4 Disconnect implements ... 86
3.18 Joystick ... 87
3.18.1 Joystick control lever ... 87
3.18.2 Joystick operation ... 87
3.18.3 Joystick lockout ... 88
3.18.4 Hydraulic ports ... 89
3.19 Roll-over protective structure ... 90
3.20 Transport on a trailer ... 91
3.21 Auxiliary hydraulic system ... 92
4 Maintenance ... 93
4.1 Lubrication and maintenance ... 95
4.1.1 Lubrication and maintenance chart for daily inspection ... 95
4.1.2 Lubrication and maintenance chart ... 95
4.1.3 Lubrication fill and drain locations ... 97
4.1.4 Lubrication fittings ... 97
4.2 Engine oil and filter ... 98
4.2.1 Examine the engine oil ... 98
4.2.2 Change the engine oil ... 99
4.2.3 Replace the engine oil filter ... 100
4.3 Transmission oil ... 101
4.3.1 Examine the transmission oil level ... 101
4.3.2 Change the transmission oil and filter ... 101
4.4 Front axle oil ... 103
4.4.1 Examine the front axle oil level ... 103
4.4.2 Change the front axle oil ... 103

4.5 Engine coolant 104
4.5.1 Coolant 104
4.5.2 Coolant level 104
4.5.3 Replace the engine coolant 104
4.6 Engine belt 106
4.6.1 Adjust the engine belt 106
4.7 Engine air filter 108
4.7.1 Clean the engine air filter 108
4.8 Fuel system 110
4.8.1 Fuel filter 110
4.8.2 Replace the fuel filter 110
4.8.3 Remove air from the fuel system 111
4.8.4 Fuel tank filler cap 111
4.8.5 Fuel system components 112
4.8.6 Hand throttle lever 112
4.9 Electrical system 113
4.9.1 Battery 113
4.9.2 Replace the battery 114
4.9.3 Start the engine with a booster battery 115
4.9.4 Fuses 115
4.9.4.1 Fuses locations 116
4.9.5 Neutral start switches 117
4.9.6 Spare power supply 118
4.10 Adjust the brakes 119
4.11 Hydrostatic adjustments 120
4.12 Steering system 121
4.12.1 Steering free play 121
4.12.2 Adjust the front wheel alignment 121
4.13 Wheels 123
4.13.1 Wheels and tires 123
4.13.2 Wheel bolt torque 123
4.13.3 Wheel bolt torque chart 123
4.14 Prepare tractor for storage 124
4.15 Power washing 125
5 Troubleshooting 127
5.1 Engine troubleshooting 129
5.2 Brakes troubleshooting 133
5.3 Hydraulic system troubleshooting 134
5.4 Steering system troubleshooting 135
5.5 Electrical system troubleshooting 136
5.6 Hydrostatic transmission troubleshooting 137
6 Specifications 139
6.1 Specifications 141
6.1.1 Lubrication specifications 141
6.1.2 Capacities 141
6.1.3 Engine specifications 142
6.1.4 Electrical specifications 142

6.1.5 Fuel specifications 143
6.1.6 Front axle specifications 143
6.1.7 Hydraulic specifications 143
6.1.8 Power take-off specifications 144
6.1.9 Transmission specifications 144
6.1.10 Maximum load capacity 145
6.1.11 Tire inflation pressures 145
6.2 Dimensions 146
6.2.1 Tractor dimensions 146
6.3 Bolt torque 148
6.3.1 Bolt torque chart 148
6.3.2 Wheel bolt torque chart 148
7 Accessories 149
7.1 Accessories 151
7.1.1 Canopy 151
7.1.2 Engine block heater 151
7.1.3 Implements and attachments 151
8 Assembly 153
8.1 Checklists 155
8.1.1 Pre-Delivery Inspection checklist 155
8.1.2 Supply checklist 155
Index 157

1 Safety

1.1 Introduction 15
1.1.1 Safety symbol 15
1.1.2 Safety messages 15
1.1.3 Messages 15
1.1.4 Safety signs 15
1.1.5 A word to the operator 16
1.1.6 This manual 16
1.2 Operation 17
1.2.1 Prepare for operation 17
1.2.2 Roll over protective structure 17
1.2.3 General information 17
1.2.4 Personal protective equipment 20
1.2.5 Seat instruction 21
1.2.6 Shield and guards 21
1.2.7 Power take-off safety 22
1.2.8 Exhaust warning 22
1.2.9 Flying debris 23
1.2.10 The agricultural chemicals 23
1.3 Travel on public roads 24
1.4 Maintenance 25
1.4.1 General maintenance information 25
1.4.2 Prevent fire and first aid 26
1.4.3 High pressure leaks 26
1.4.4 Engine safety 27
1.4.5 Fuel safety 29
1.4.6 Battery safety 29
1.4.7 Tire safety 30
1.4.8 Replacement parts 30
1.4.9 Weld on the machine precautions 30
1.5 Safety and informational signs 31
1.5.1 Safety and informational signs location 31
1.5.2 Safety signs description 32
1.5.3 Warning - state of California 32
1.5.4 Electrical hazard 32
1.5.5 Hot surface 32
1.5.6 Hot pressurized coolant 33
1.5.7 Entanglement hazard - belt 33
1.5.8 Explosion and/or fire hazard - starting fluid 33
1.5.9 Shear hazard - engine fan 33
1.5.10 Run over hazard 34
1.5.11 Fuel 34
1.5.12 Flammable fuel 34
1.5.13 Roll-over hazard (only for ROPS model) 34

1.5.14 Roll-over crush hazard (only for TLB model) 35
1.5.15 Operators manual 35
1.5.16 Shut off engine 35
1.5.17 Movement hazard 35
1.5.18 Crush hazard 36
1.5.19 Roll-over crush hazard - slope 36
1.5.20 Fall off or run-over hazard 36
1.5.21 Entanglement hazard - power take-off 36
1.5.22 Rear rollover hazard 37
1.5.23 Component separation flying object 37

1.1 Introduction

1.1.1 Safety symbol

The safety symbol tells you about an area that can be dangerous.

Look for the safety symbol in this Operator's Manual and on the machine. The safety symbols tell you that there are important safety instructions in the manual.

Fig. 1

1.1.2 Safety messages

The words DANGER, WARNING or CAUTION are used with the safety symbol. Learn these safety messages and obey the recommended precautions and safety instructions.

Fig. 2

DANGER:
If you do not obey the recommended precautions and safety instructions, DEATH OR INJURY will occur.

WARNING:
If you do not obey the recommended precautions and safety instructions, DEATH OR INJURY can occur.

CAUTION:
If you do not obey the recommended precautions and safety instructions, INJURY can possibly occur.

1.1.3 Messages

The messages important and note are not related to personal safety. They give information about the operation and maintenance of the machine.

IMPORTANT: *If you do not follow the special instructions or procedures, you can cause damage to the machine. You can also cause damage to the process, or the area around the machine.*

NOTE: *Information to help you do the procedure, or help you to understand.*

1.1.4 Safety signs

NOTE: *Do not remove the safety signs. Replace the safety signs that you cannot read, are damaged, or are missing.*

Clean the machine surface with a weak soap and water solution before you replace the safety signs. The replacement safety signs are available from your dealer.

Always make sure that the safety signs are in the correct locations and that you can read the safety signs. The illustrations of safety sign locations are in this section.

Keep the safety signs clean. If it is necessary, clean the safety signs with a weak soap and water solution.

1.1.5 A word to the operator

It is your responsibility to read and understand the safety section in this manual and the manual for all implements before you operate this machine. You are responsible for your safety. Good safety procedures prevent injury to you and the persons around you.

Make the information in the safety section of this manual a part of your safety procedure. This safety section is written only for this type of machine. Safety is your responsibility. You can prevent injury and death.

This safety section gives basic safety examples that can occur during the operation and maintenance of your machine. This safety section is not a replacement for safety instruction in other sections of this manual.

Injury or death can occur if the safety instruction is not obeyed.

Fig. 3

Learn how to operate the machine and how to use the controls correctly.

Do not operate the machine if you do not know how to operate the machine. Do not let persons operate the machine that do not know how to operate the machine.

Follow all safety instructions in the manuals and on the safety signs on the machine, the implements, and the attachments.

Use only approved attachments and implements.

Make sure that your machine has the correct equipment that is necessary by the local regulations.

WARNING:

Do not use alcohol or drugs that can have an effect on alertness or coordination. If you use prescription or 'over the counter' drugs, get medical advice about the safe operation of machines.

CAUTION:

If attachments or implements used with this machine have a different operator manual, see that operator manual for other important safety instructions.

1.1.6 This manual

This manual includes general safety instructions for this machine. Keep this manual with the machine.

This manual uses right and left as if you are in the operator seat.

The manufacturer has the authority to change the machine as necessary without notification. Thus, your machine can show small differences to the information in this manual. All the data in this manual was correct at the time of production.

NOTE: *To show the information more clearly, the illustrations in this manual can show the shields and guards removed.*

1.2 Operation

1.2.1 Prepare for operation

Read and understand all operation instructions and precautions in this manual before you operate the machine or do the servicing.

Make sure that you know and understand the positions and operations of all controls. Make sure that all controls are in neutral and that you apply the parking brake before you start the machine.

Make sure that all persons are away from your area of work before you start and operate the machine. Examine and learn the controls in an area that is clear of persons and blockage before you start work. Know the machine dimensions and make sure that you have sufficient space available to operate the machine. Do not operate the machine at high speeds in areas with many persons.

It is important to know and use the correct procedures when you do work around and operate the machine. Only let approved persons operate the machine. Keep others, especially children, away from your area of work. Do not let others ride on the machine.

Make sure that the machine is in good condition for operation. Refer to the operator manual. Make sure that the machine has the correct equipment required by local regulations.

1.2.2 Roll over protective structure

The roll over protective structure (ROPS) is effective in reducing injuries during overturns. Overturning a tractor without ROPS or with the ROPS folded down can result in serious injury or death. Operate with ROPS folded down only when conditions make this necessary. Return ROPS to upright, locked position as soon as conditions permit.

Do not weld, drill, or alter the ROPS.

If the tractor has been rolled over or the ROPS frame has been damaged in any manner, the ROPS must be replaced. Do not attempt to repair a damaged ROPS. If damage does occur, consult your dealer and replace all damaged parts.

Before using the tractor make sure the ROPS frame is not damaged and it is securely fastened to the tractor.

Do not attach chains, ropes, or cables to the ROPS for pulling purposes - damage to the ROPS and/or overturn of the tractor may result. Always pull from the tractor drawbar.

Observe all recommendations and instructions regarding the installation of covers or roofs which are used as sunshields only, and do not afford the operator protection from falling objects.

1.2.3 General information

When parking, park the machine on a solid level surface and lower any implements to the ground. Put all controls in neutral and apply the parking brake. Stop the engine and take the key with you.

WARNING:
Do not leave the machine unattended with any implement or attachment in the raised position. Lower the implement or attachment fully before leaving the machine. A sudden loss of hydraulic pressure can cause the implement or attachment to drop without warning.

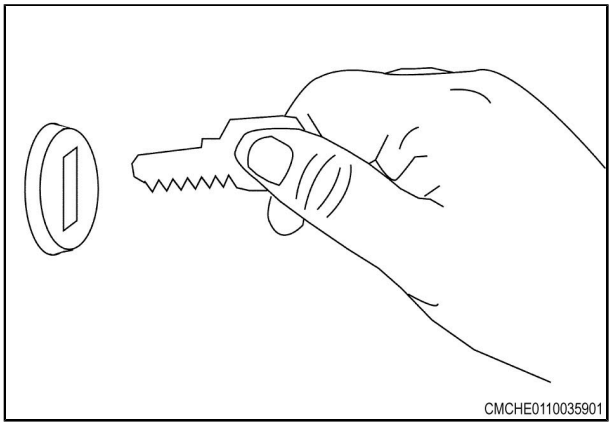


Fig. 4

Make sure the machine is in the proper operating condition according to the Operator Manual.

Do not dismount from moving machinery.

Stay off slopes too steep for operation.

Be aware of the size of the machine and have enough space available to allow for operation.

Do not operate near the edge of banks. Setback distance from the bank must equal or exceed, the overall height of the bank.

Whenever possible, travel directly up or down slopes, keeping the heavy end of the tractor on the uphill side. If necessary to cross a steep slope, avoid turning uphill. Slow down and make a wide turn.

Do not operate on steep slopes as overturn may result.

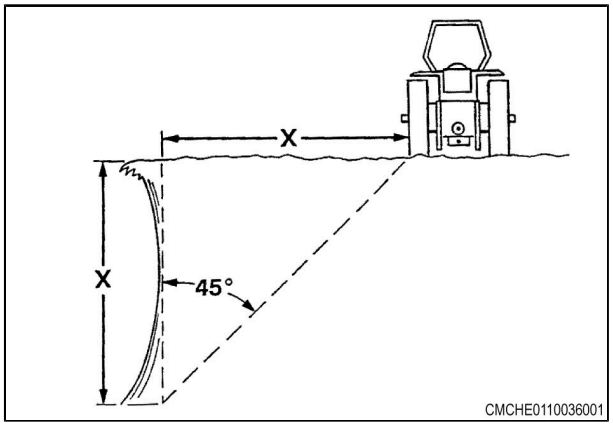


Fig. 5

On models with independent brake pedals, keep the brake pedals latched together at all times unless independent braking is required. Never use independent braking during transport.

Always drive at a proper speed relative to local conditions and ensure your speed is low enough for an emergency stop.

Reduce speed prior to turns to avoid the risk of overturning.

Keep speed to a minimum.

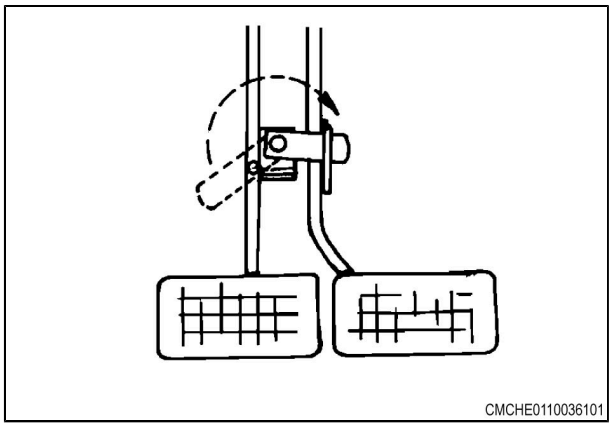


Fig. 6

Always keep the tractor in gear to provide engine braking when going downhill. Do not coast.

Avoid sudden or heavy brake applications when operating in wet, muddy, or icy ground conditions, or on loose surfaces, such as sand or gravel.

Sudden or heavy braking during turns increases the tendency to over steer. This effect is more pronounced with trailed equipment.

Keep a firm grip on the steering wheel at all times, with the thumbs clear of the spokes when driving the tractor.

Remain seated in operator's seat.

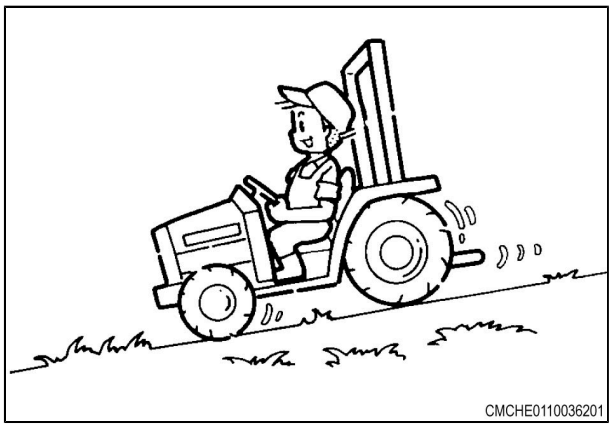


Fig. 7

In the event of an overturn, hold the steering wheel firmly and keep your seat belt fastened. Do not attempt to leave the seat until the tractor has come to rest.

Watch for holes, rocks, or other hidden hazards. Always inspect area prior to operation.

Be observant of the operating area and terrain.

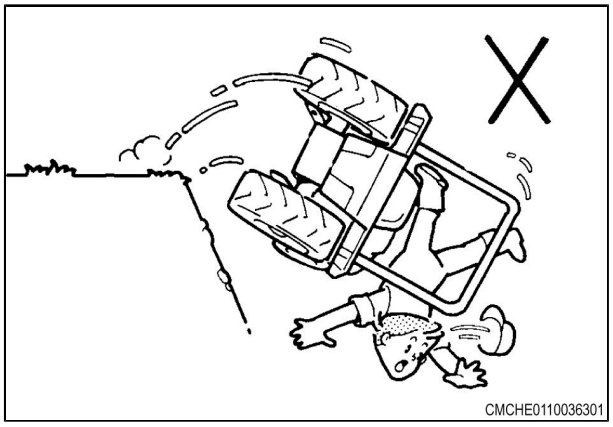


Fig. 8

Avoid contact with electrical power lines. Contact with electrical power lines can cause electrical shock, resulting in very serious injury or death.

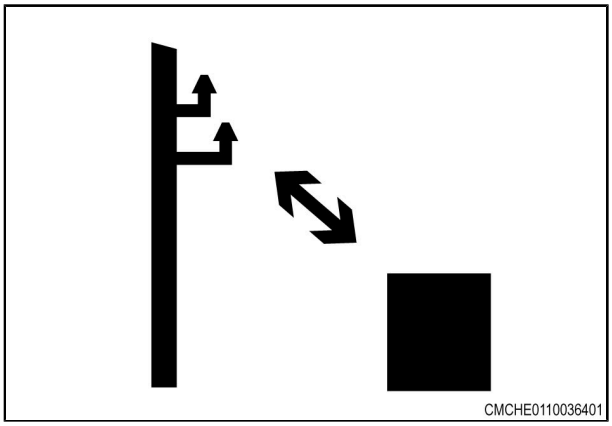


Fig. 9

Never allow anyone on any part of the tractor or attachments except in the operator's seat when the engine is running.

Do not get on or off the tractor or attachments while the tractor is moving.

Do not carry passengers.

Fig. 10

Always shut off the engine, shift the transmission to neutral, set parking brake to ON and remove the start key before leaving the operator's seat or before permitting anyone to inspect, clean, lubricate, adjust or repair any part of the tractor or attachments. Never leave the tractor unattended while the engine is operating.

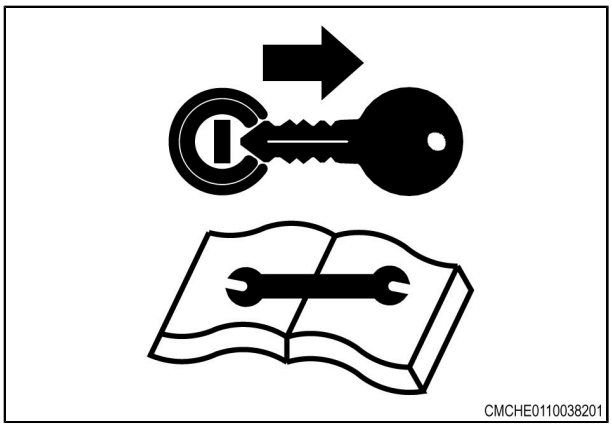


Fig. 11

Pull only from the approved drawbar.

Towing or attaching to other locations may cause the tractor to overturn.

Use a safety transport chain with towed implements. A safety transport chain connecting the tractor to the implement will help control pull-type equipment should it accidentally separate from the drawbar.

Always attach the safety transport chain to the tractor drawbar support.

Provide only enough slack in the safety transport chain to permit turning. See your dealer for a chain with strength rating equal to or greater than the gross weight of the towed machine.

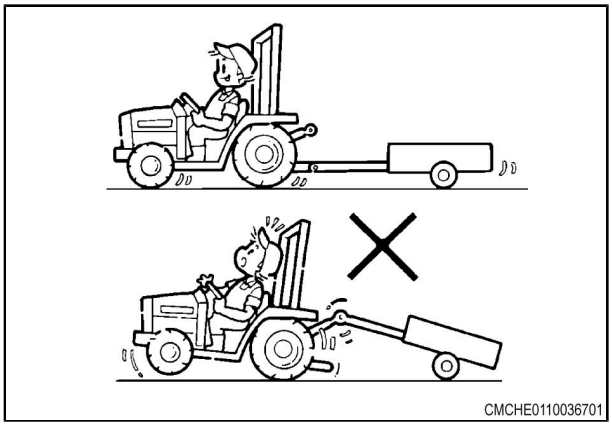


Fig. 12

For safety reasons, when towing a trailer or loading a heavy attachment, four-wheel drive should be engaged.

For towed equipment without brakes, do not tow equipment at speeds over 32 km/h(20 mph). Do not tow equipment that, when fully loaded, weighs more 1.5 times the weight of the towing unit.

For towed equipment with brakes, do not tow equipment at speeds over 40 km/h(25 mph). Do not tow equipment that, when fully loaded, weighs more than 4.5 times the weight of the towing unit.

Stopping distance increases with speed and weight of towed loads, and on hills and slopes. Towed loads with or without brakes, that are too heavy for the tractor or are towed too fast, can cause loss of control. Consider the total weight of the equipment and load.

When using a loader attachment, to avoid serious injury or death due to falling loads resulting from inadvertent raising or roll-back of the loader, do not connect loader hydraulics to any tractor auxiliary valve that has detents which cannot be locked out or removed, except for the float function in the loader lower circuit. If the tractor is equipped with such a valve, a dedicated, properly configured loader valve must be installed.

Make sure the proper attachment is on the loader so the load is restrained and cannot roll down the loader arms onto the operator.

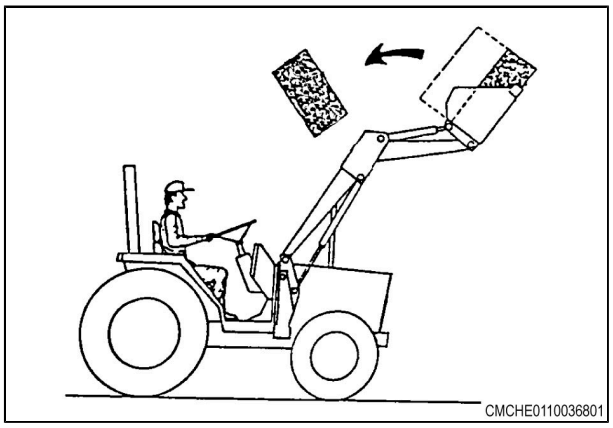


Fig. 13

1.2.4 Personal protective equipment

Put on all personal protective equipment (PPE) and protective clothes that are supplied to you or that are necessary for the conditions and by applicable laws. PPE includes equipment to prevent injury to your eyes, lungs, ears, head, hands and feet.

Always keep hands, feet, hair, and your clothes away from parts that move. Do not put on loose clothing, jewelry, watches, or other items that can tangle in parts that move. Tie up long hair that can also tangle in moving parts.

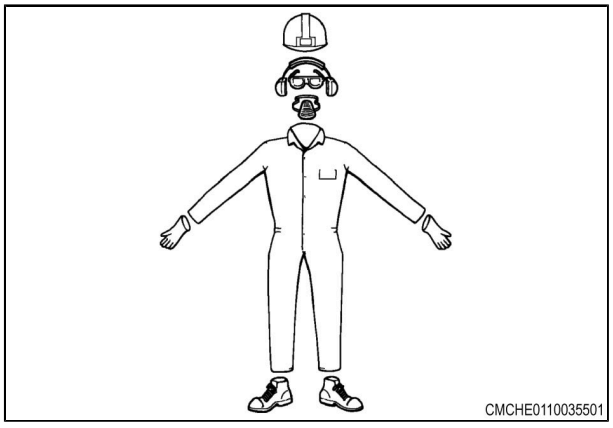


Fig. 14

1.2.5 Seat instruction

Securely fasten the seat belt before operating the machine. Always remain seated and have the seat belt fastened while operating the machine when the roll over protective structure (ROPS) is in the upright position. Replace the seat belts when they become worn or broken.

Never wear a seat belt loosely or with slack in the belt system. Never wear the seat belt in a twisted condition or pinched between the seat structural members.

Do not wear the seat belt when the ROPS is folded down.

Do not adjust the steering column or seat while driving.

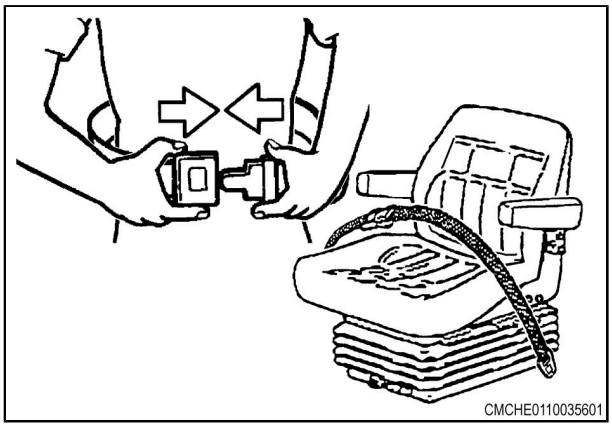


Fig. 15

1.2.6 Shield and guards

WARNING: Entanglement hazard. Belts and components that rotate.

Severe personal injury or death can occur.

Do not open, remove, or put your hand behind shields if the engine is running. Stop the machine before doing service to the machine.

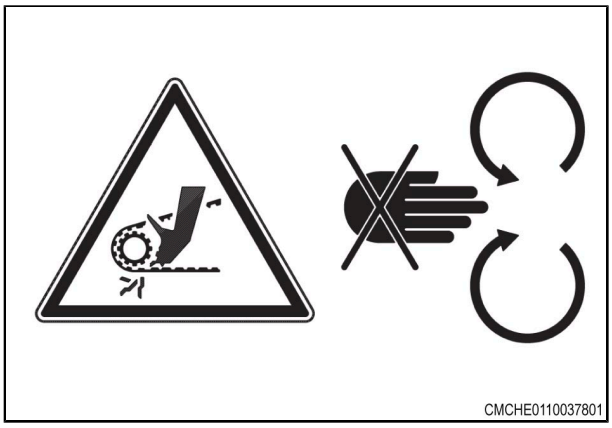


Fig. 16

All shields and guards must be in the correct position and in good condition. Keep away from the components that rotate.

DANGER: Entanglement hazard. Rotating components.

Severe personal injury or death can occur.

Do not make adjustments or repairs to components while they are moving. Stop the machine before doing service to the machine.

Do not operate the machine with the drive shaft shields open or removed.

Keep away from the components that turn.

Make sure guards that turn are free.

Fig. 17

1.2.7 Power take-off safety

Keep all shields in place.

The rear power take-off (PTO) master shield (1) must be correctly installed at all times. The PTO shaft cover(s) must be installed when the PTO driveline is not in use.

Do not use PTO adapters. PTO shaft adapters, reducers and/or extensions extend the implement drive shaft coupler and universal joint beyond the protection of the PTO master shield.

Reduce PTO speed slowly. When stopping any PTO driven machine, idle the engine to reduce the PTO speeds before disengaging.

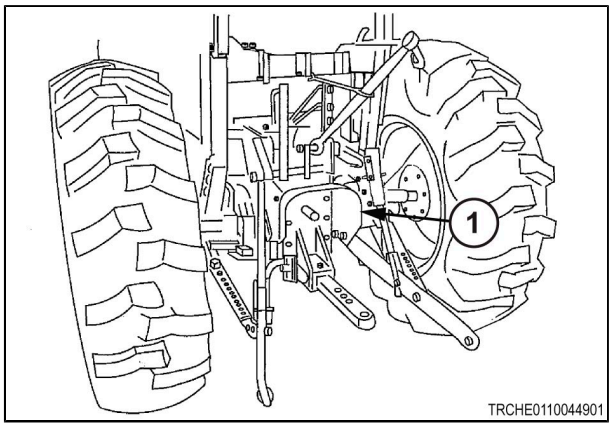


Fig. 18

The implement drive shaft coupler (1) must securely lock to, and be retained by the annular groove on the tractor PTO shaft.

Always disengage the PTO, park the tractor, shut off the engine and remove the key before:

- Connecting or disconnecting the implement drive shaft.
- Adjusting the PTO driveline or PTO driven machine.
- Cleaning, unplugging, or servicing the PTO driven machine.

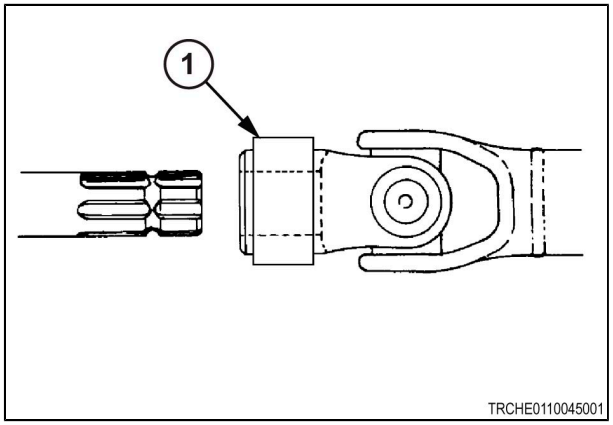


Fig. 19

1.2.8 Exhaust warning

WARNING: Inhalation hazard. Exhaust gases.

Death or serious illness can occur.

Do not operate the engine in a closed building unless the exhaust is ventilated to the outside.

Do not tamper with or modify the exhaust system with unapproved extensions.

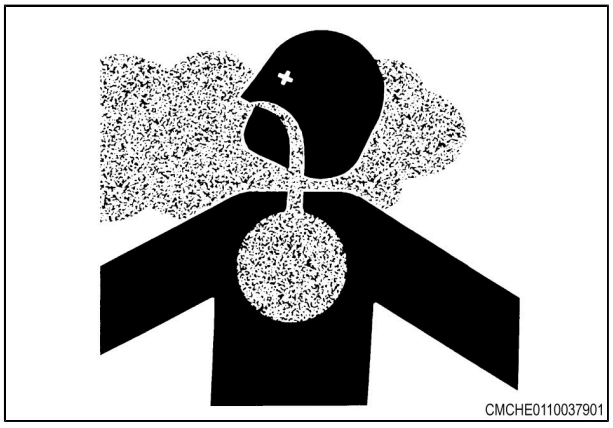


Fig. 20

1.2.9 Flying debris

WARNING:

Be careful when you operate along the side of a road or structures. Rocks and other materials can be thrown from the machine during operation and can cause injury.

Stay away from the machine during operation. Some materials can be thrown from the machine during operation and cause injury.

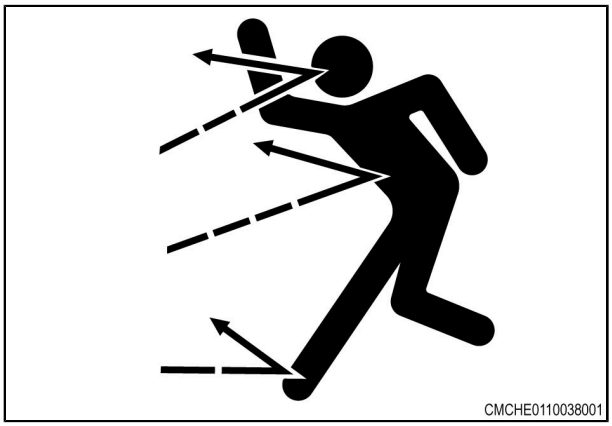


Fig. 21

1.2.10 The agricultural chemicals

The agricultural chemicals can be dangerous. Incorrect procedures with the agricultural chemicals can cause injuries to plants and animals, and damage soil and property.

Always read and obey the instructions from the manufacturer before you open chemical containers.

Read and obey the instructions each time you use a chemical.

Use the same precautions when you do the adjustments, do servicing, clean or put the machine into storage.

Tell all persons who are near chemicals of the possible dangerous results and the safety precautions that are necessary.

Stay away from smoke from a chemical fire. Stay out of direction of wind if it is possible.

Correctly keep or discard all chemicals that you do not use. Obey the instructions from the chemical manufacturer and the local regulations.

1.3 Travel on public roads

Make sure that you understand the speed, brakes, steering, and load properties of this machine before you operate the machine on public roads.

Use good judgment when you operate the machine on public roads. Keep complete control of the machine at all times. Do not coast on the downhills.

The maximum speed of agricultural equipment is controlled by local regulations. Adjust travel speed to keep control of the machine at all times.

Learn and obey all road rules and laws that apply to your machine. Get information from your local law enforcement agency for local regulations about the movement of agricultural equipment on public roads. Use head lamps, flashing warning lamps, rear lamps and turn signals, day and night, unless local laws do not let you.

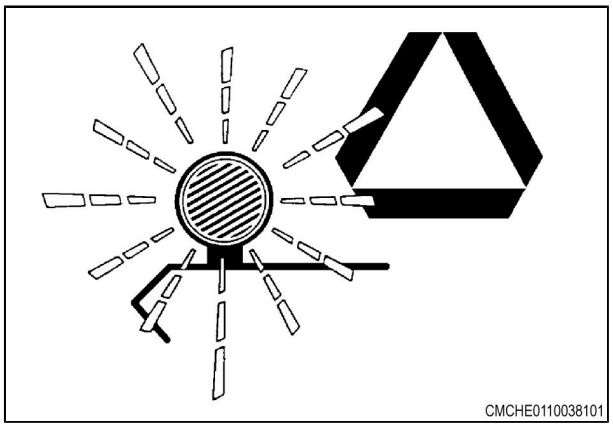


Fig. 22

Make sure that all flashers operate before you operate the machine on a public road. Make sure that the reflectors are installed correctly, in good condition, and clean. Make sure that the Slow Moving Vehicle (SMV) emblem is clean, can be seen, and is installed correctly on the rear surface of the machine.

If the machine has a loader, operate the machine with the loader as low as possible. Do not operate the machine with loader up.

If the machine has two brake pedals, lock the brake pedals together to make the two wheel brakes apply at the same time.

Lift implements to the transport position and lock the implement in position. Put all implements into the most narrow position.

Disengage the power take-off and the differential lock.

With towed implements, use a correct hitch pin with a clip retainer and safety transport chain.

Look at other traffic on the road. Keep to your side of the road and pull to the side of the road, when possible, to let faster traffic through.

Know the total width, length, height, and weight of the machine. Be careful when you operate the machine on narrow roads and across narrow bridges.

Do not let the machine touch electrical power lines. If the machine touches electrical power lines, electrical shock injury and death can occur.

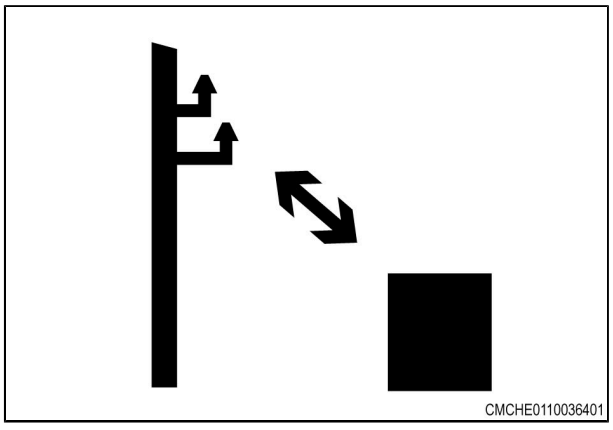


Fig. 23

1.4 Maintenance

1.4.1 General maintenance information

Before you do maintenance, lubricate, do servicing, clean, or make adjustments:

- Park the machine on a solid, level surface.
- Make sure that all the controls are in the neutral position and apply the parking brake.
- Make sure that the machine and the attachments are lowered to the ground.
- Stop the engine and take the key with you.
- Look and Listen! Make sure that all parts that move are stopped.
- Put chocks in front of and behind the wheels of the machine before you do work on or below the machine.

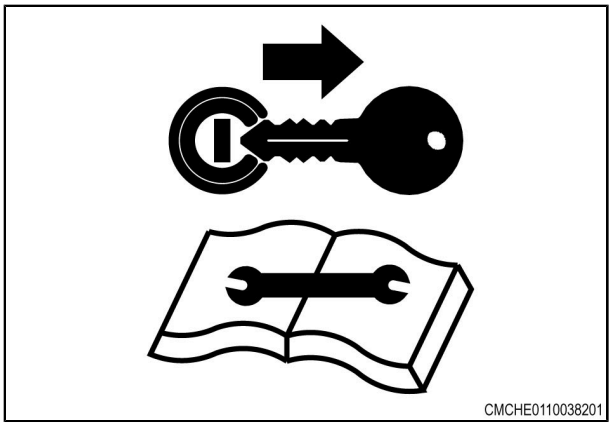


Fig. 24

After you do work on the machine, remove all tools from the machine.

Make sure that electrical connectors are clean before you connect them.

Do a check for loose, broken, missing, or damaged parts. Make sure that the machine is in good repair. Make sure that all guards and shields are in position.

Do not do the servicing, examine or adjust chains or belts while the engine is in operation.

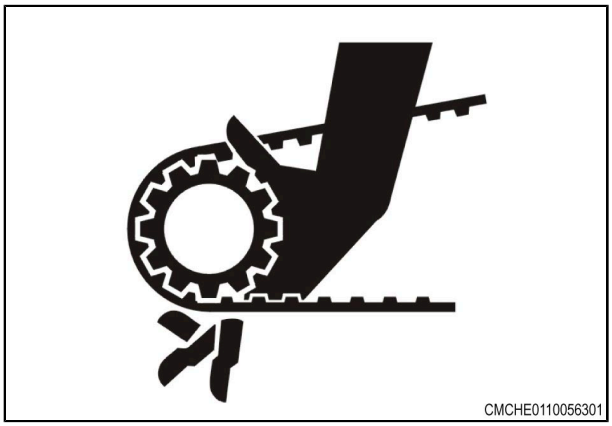


Fig. 25

Do not operate the machine with the drive shaft shields open or removed. Entanglement in drive shafts that rotate can cause injury or death.

Stay clear of components that rotate.

Make sure that guards that rotate can rotate freely.

A loose yoke can come off a shaft and result in injury to persons or damage to the machine.

When you install a quick disconnect yoke, the spring activated locking pins must move freely and be in the groove on the shaft. Pull on the driveline to make sure that the quick disconnect yoke can not be pulled off the shaft.

Fig. 26

Remove spilled oil, antifreeze or fuel immediately from the steps, platform, and other access areas.

Keep all access areas clean of unwanted materials.

Fig. 27

1.4.2 Prevent fire and first aid

Prepare for emergencies.

Keep a first aid kit at hand for small injuries.

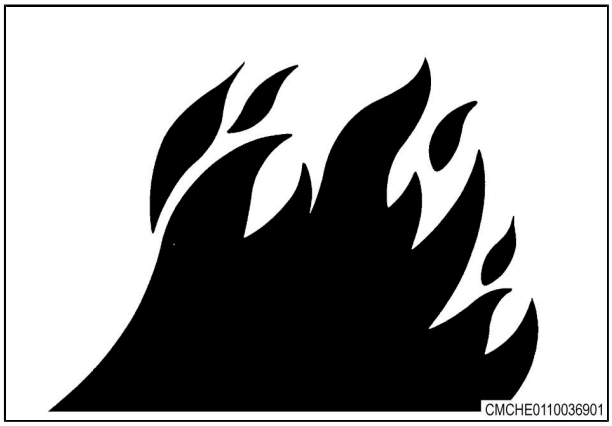


Fig. 28

- The crop material is flammable. Regularly remove the unwanted crop material from the machine to prevent a fire.
- Use a water type fire extinguisher, A class fire extinguisher or other water source to extinguish a crop fire.
- Examine the components to make sure that they do not become too hot. Listen for noises that are not usual during operation. Unusual noises can show that a component has wear. Worn components can become hot and start a fire.
- Keep the fire extinguishers in a location that you can access easily also near where the fires can occur.
  - Examine the fire extinguishers regularly, refer to the manufacturer's equipment manual.
  - Make sure that the fire extinguisher is full and in a condition that operates.
- For fires of material other than crop (for example oil or electrical components), use a dry chemical fire extinguisher of A, B or C class.
- Before you cut, weld, or grind on the machine, remove flammable materials from the machine and the work area.
- If a fire occurs, move out of the smoke and away from the fire. Get aid from your local emergency services.

1.4.3 High pressure leaks

WARNING: Hydraulic fluid under pressure can penetrate the skin or eyes.

Serious personal injury, blindness, or death can occur.

Relieve the pressure from the system or component before disconnecting components. Wear personal protective gear while working on the machine or equipment. Use a piece of cardboard to check for leaks. Never use your hand.

Fluid that leaks from the hydraulic system or the fuel injection system is high pressure and is not easily seen. The fluid can go into the skin causing injury.

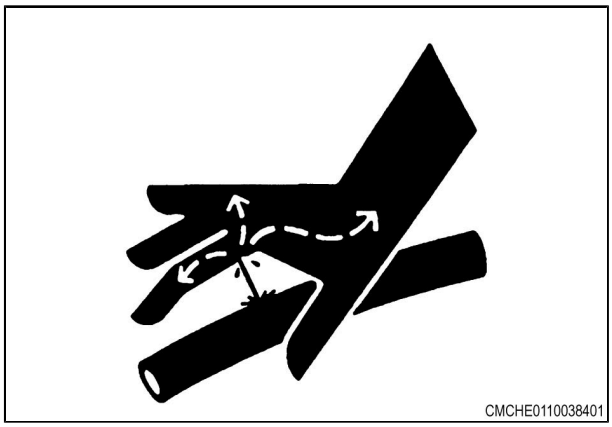


Fig. 29

Fluid that is injected into the skin must be surgically removed immediately. If not removed immediately, infection and reaction can occur. Go immediately to a physician who knows about this type of injury.

Use a piece of cardboard or wood to look for possible leaks. Do not use your bare hand. Wear leather gloves for hand protection and safety goggles for eye protection.

Remove all pressure before you loosen hydraulic lines. Lower equipment in the up position, close the accumulator valve, and stop the engine. Tighten all connections before you apply pressure.

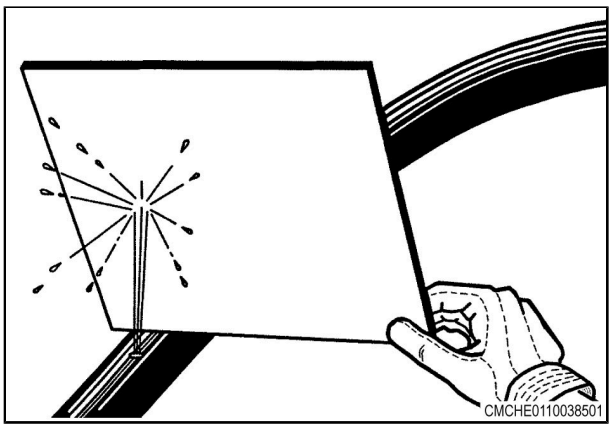


Fig. 30

1.4.4 Engine safety

Make sure all shields, guards and access doors are in position and are closed before you start the engine.

Start the engine from the operator seat only. Make sure that all controls are in neutral and the drives are disengaged.

Make sure all bystanders are clear of the machine before you start the engine.

Do not bypass the neutral start system. The neutral start system will not let the engine start if the machine is in gear. Manual override of this system can cause death and injury.

Do not connect booster cables to the starter terminals or short across the starter terminals.

Fig. 31

DANGER: Explosion hazard. Starting fluid.

Personal injury, death, or machine damage can occur.

Do not use starting fluid as a starting aid.

Do not use aerosol starting fluid to start the engine. The heaters in the intake manifold can cause ignition and explosion of the starting fluid. This explosion can cause death, injury and damage to the engine.

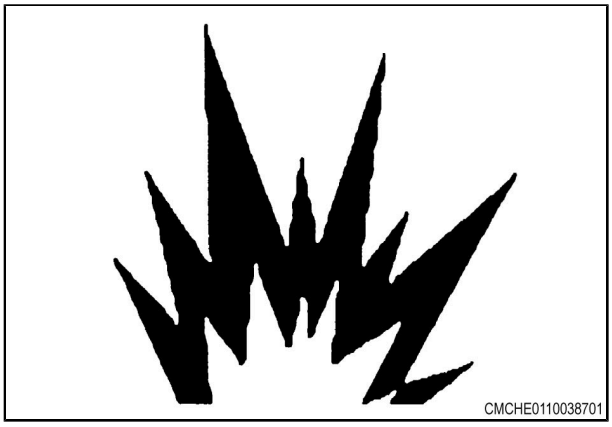


Fig. 32

DANGER: Component movement hazard.

Personal injury, death, or machine damage can occur.

Stop the engine and stop all components from moving before servicing.

Keep out of the engine compartment while the engine is in operation. Before you open the engine cover, stop the engine and take the key with you.

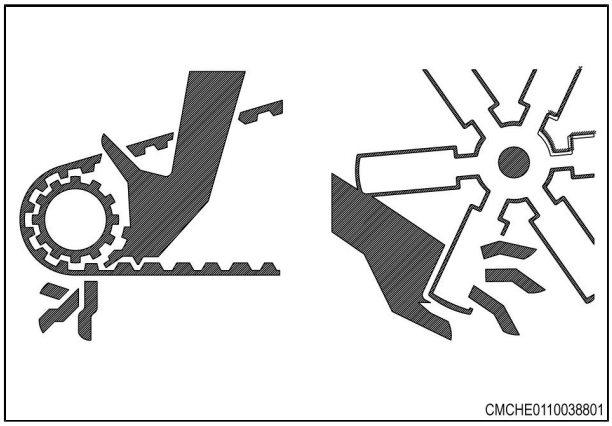


Fig. 33

WARNING: Hot components can burn.

Severe personal injury can result.

Let the engine and components cool before doing maintenance.

Know that the surfaces in and around the engine compartment will be hot if the engine has operated.

Always let parts that contain hot fluid or gases cool to the touch before you handle or disconnect them.

Fig. 34

WARNING: Pressurized fluids can be hazards.

Personal injury can result.

Allow the engine to cool. Loosen the cap to allow pressure to escape, then remove the cap.

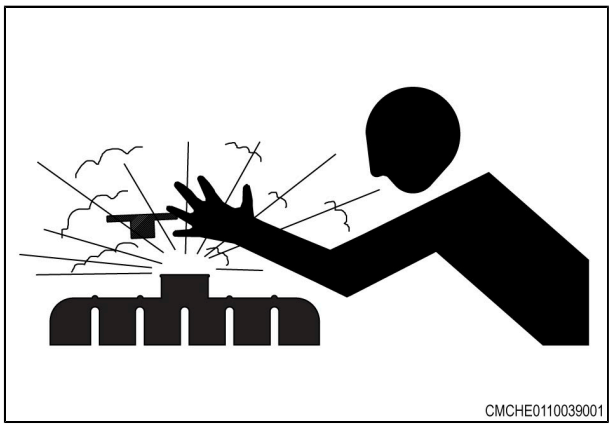


Fig. 35

1.4.5 Fuel safety

WARNING: Fire hazard. Fuel safety.

Personal injury or machine damage can occur.

Clean up any spilled oil immediately.

Fuel is flammable. Be careful with fuel.

Always stop the engine before you add the fuel.

Keep open flames and electrical sparks away from the area.

Do not smoke while you add the fuel.

Remove spilled fuel.

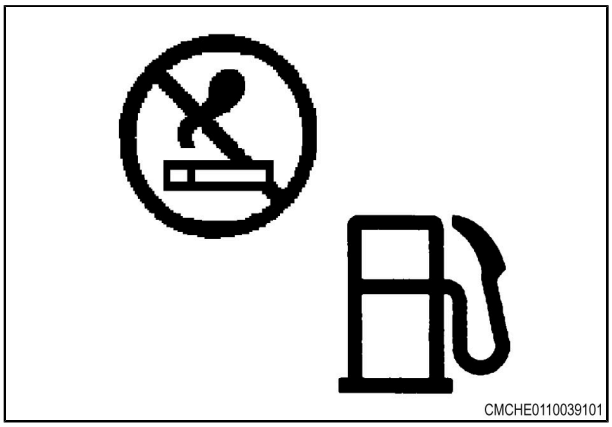


Fig. 36

1.4.6 Battery safety

WARNING: Battery explosion and acid hazard.

Battery gases are explosive and acid is corrosive. Personal injury or death can occur.

Keep sparks or open flame away from the battery. Always disconnect the grounded (-) cable first. If fluid comes in contact with skin or cloths, wash fluid off immediately. If fluid is ingested or gets in the eyes, seek medical help immediately. Never charge a frozen battery.

Electrical storage batteries give off flammable hydrogen gas. Do not smoke around batteries. Keep open flames and electrical sparks away from the battery.

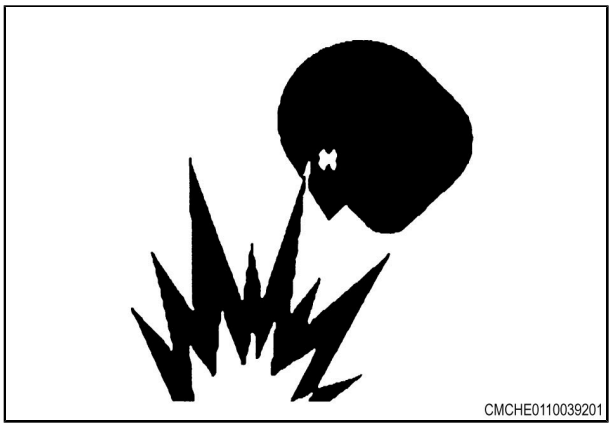


Fig. 37

Do not put tools or other objects on a battery.

Be careful when you connect booster cables to the machine. Electrical component damage and battery explosion can occur if the booster cables are not installed correctly.

Battery posts, terminals and other battery parts contain lead and lead compounds. Clean your hands after you touch a battery.

The fluid in the electrical storage batteries contains sulfuric acid. Do not let the fluid touch your eyes, skin, or clothing. Clean your hands after you touch a battery.

If battery fluids touch your skin, flush immediately with large quantities of water.

If battery fluids touch your eyes, flush with water for 15 minutes and get medical treatment immediately.

If swallowed, drink large quantities of water or milk. Do not induce vomiting. Get medical treatment immediately.

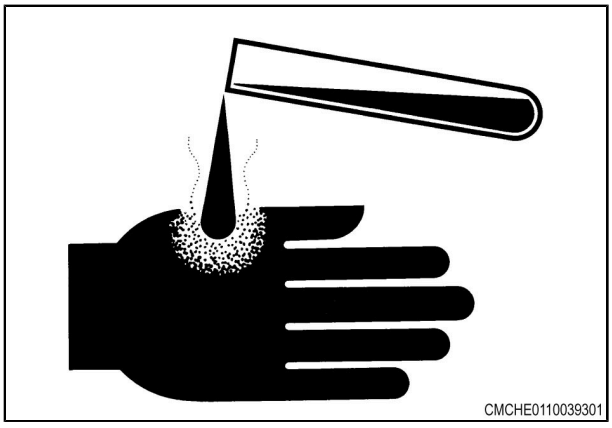


Fig. 38

1.4.7 Tire safety

Examine tires for cuts, bulges, and correct pressure. Replace worn or damaged tires. When tire service is needed, have a qualified tire mechanic service the tire. Tire changing can be very hazardous and must be done by qualified tire mechanic using proper tools and equipment.

Tire explosion and/or serious injury can result from over inflation. Do not exceed the tire inflation pressures.

Do not inflate a tire that is seriously under inflated or has been run flat. Have the tire examined by qualified tire mechanic.

Do not weld on the rim when a tire is installed. Welding will make an air/gas mixture that can cause an explosion and burn with high temperatures. This hazard applies to all tires, inflated or deflated. Removing air or breaking the bead is not enough. The tire must be completely removed from the rim prior to welding.

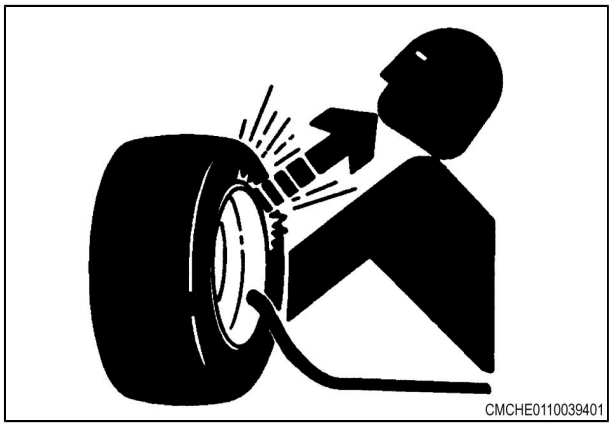


Fig. 39

When preparing a calcium chloride solution for fluid ballast the tractor tires, never pour water onto the calcium chloride. A chlorine gas can be generated which is poisonous and explosive. This can be avoided by slowly adding calcium chloride flakes to water and stirring until they are dissolved.

When seating tire beads onto rims, never exceed 2.4 bar(35 psi) or the maximum inflation pressure specified on the tire. Inflation beyond this maximum pressure may break the bead, or even the rim, with explosive force.

1.4.8 Replacement parts

Where replacement parts are necessary for machine maintenance and servicing, you must use original equipment replacement parts.

The manufacturer will not accept responsibility for installation of unapproved parts and/or accessories and damages as a result of their usage.

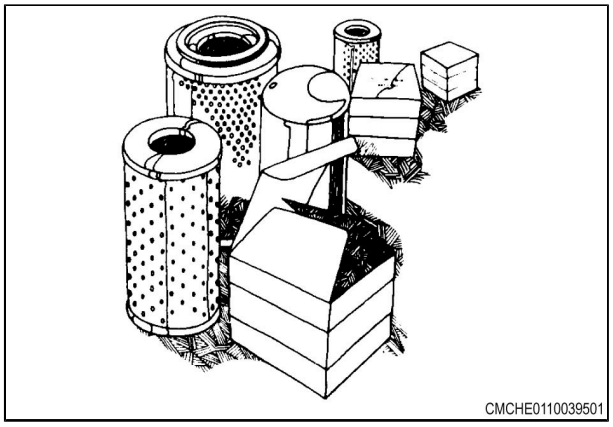


Fig. 40

1.4.9 Weld on the machine precautions

Before you weld on the machine:

- Disconnect battery terminals and put them out of the way.
- Disconnect all controllers and monitors.
- Connect the welding ground as close as possible weld area.

If you do not disconnect the electrical components, the component can be damaged.

When you connect the electrical connections, connect the battery cables last.

1.5 Safety and informational signs

1.5.1 Safety and informational signs location

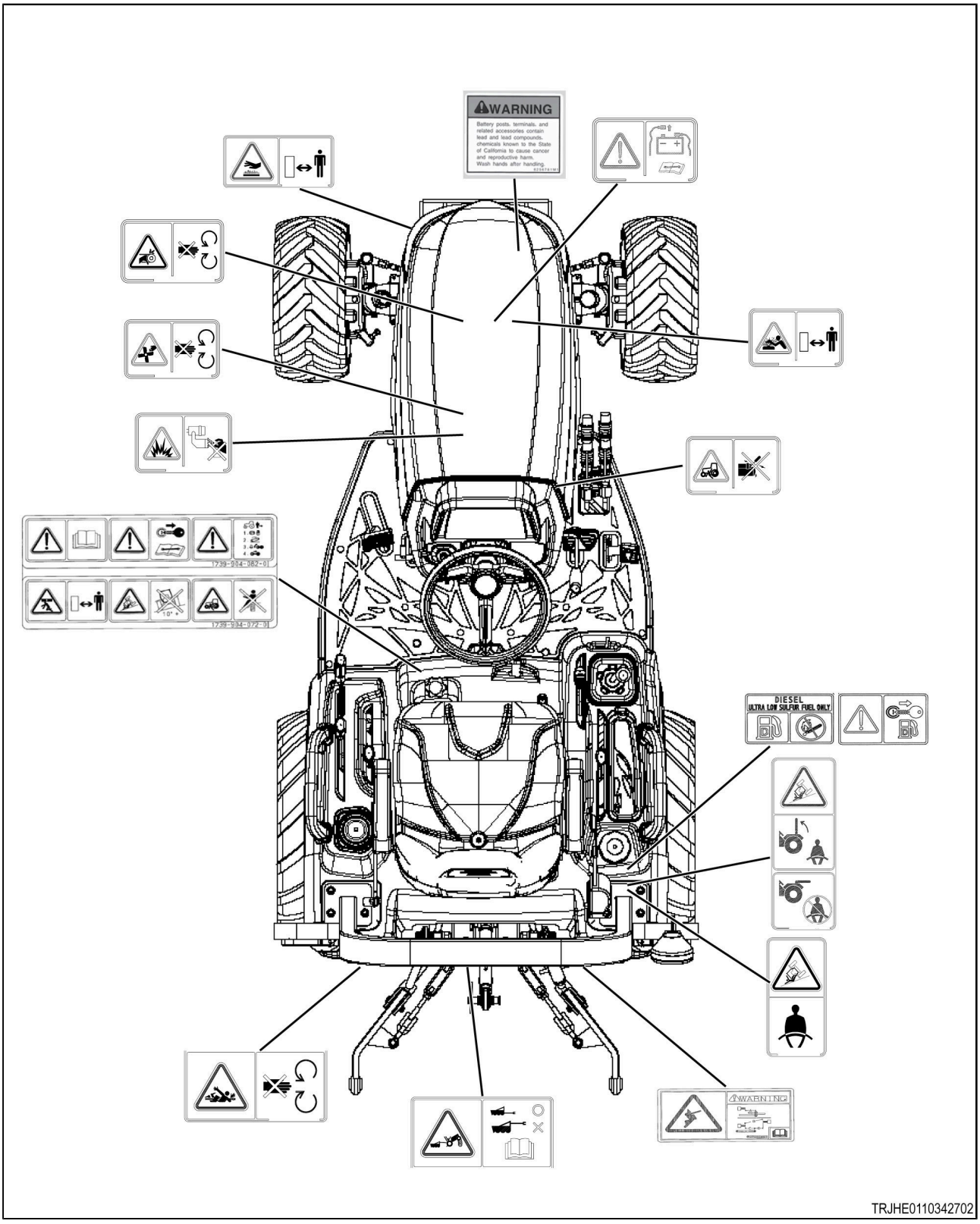


Fig. 41

1.5.2 Safety signs description

Most of the safety signs on this machine have two panels with few or no words.

- The hazard panel (A) depicts the hazard and the consequence of encountering the hazard.
- The avoidance panel (B) depicts the action required to avoid the hazard.

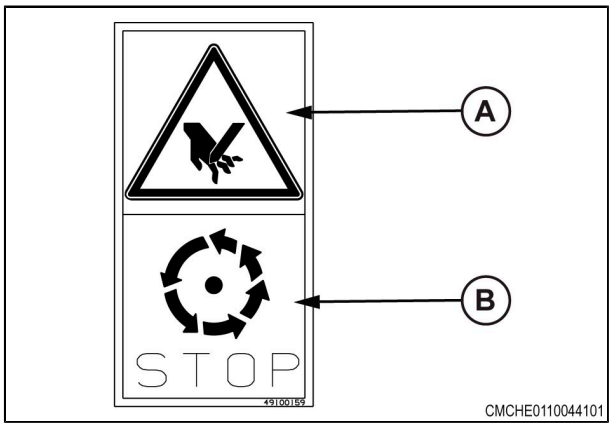
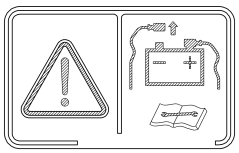


Fig. 42

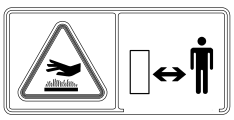
1.5.3 Warning - state of California

Warning - state of California	
	Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

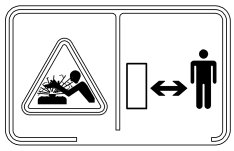
1.5.4 Electrical hazard

Electrical hazard	
 TRJHE0110190	When disconnecting the battery, do not ground out the positive side of the battery. Possible electrocution or shock can occur. Read the service manual. Read the operator manual. A lead-acid battery makes flammable and explosive gases. Keep the sparks and flames away from the battery. Injury or death can occur.

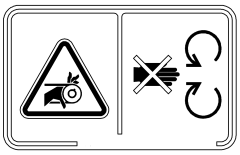
1.5.5 Hot surface

Hot surface	
 TRJHE0110198	Machine components get hot during operation. Prevent touching hot surfaces. Touching hot surfaces will cause dangerous burns. Do not touch a component until the machine becomes cool.

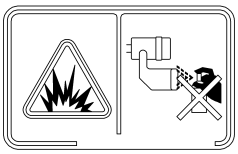
1.5.6 Hot pressurized coolant

Hot pressurized coolant	
 TRJHE0110190	Hot coolant can cause serious burns. Do not open the filler cap for the cooling system until the engine has stopped and the engine components have become cool. Then slowly loosen the filler cap to release the pressure.

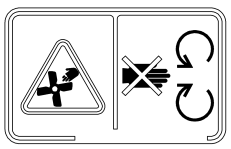
1.5.7 Entanglement hazard - belt

Entanglement hazard - belt	
 TRJHE0110198	Stay out of the engine compartment while the engine is on. Keep all body-parts clear of the belts. Injury or death can occur. Stop the engine and remove the key before maintenance or repair work.

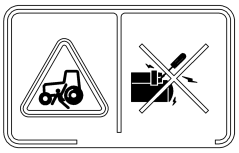
1.5.8 Explosion and/or fire hazard - starting fluid

Starting fluid	
 TRJHE0110190	Do not use ether or starting fluid at any time. Using starting fluid can result in engine damage and/or personal injury.

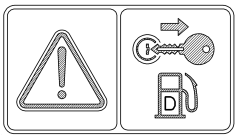
1.5.9 Shear hazard - engine fan

Shear hazard - engine fan	
 TRJHE0110198	Stay out of the engine compartment while the engine is on. Keep all body-parts clear of the fan. Injury or death can occur. Stop the engine and remove the key before maintenance or repair work.

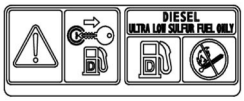
1.5.10 Run over hazard

Run over	
 TRJHE0110199(	Never bypass start the engine by making a connection across the starter terminals. The engine can start and the machine can move if the normal circuits are bypassed. Never start the engine while standing on the ground. Start the engine only from the operator's seat with the seat belt on. The drive lever must be in neutral and the park brake engaged.

1.5.11 Fuel

Fuel	
 TRJHE0110199(	Always stop the engine before adding fuel.

1.5.12 Flammable fuel

Flammable fuel	
	Use diesel fuel. Before replenishing fuel, be sure to stop the engine and wait until the engine and heated parts cool down sufficiently. Keep sparks, open flames, ect. away from the fuel tank. No smoking!

1.5.13 Roll-over hazard (only for ROPS model)

Roll-over hazard	
 TRJHE0110199(	The machine operator must have the seat belt correctly connected during machine operation.

1.5.14 Roll-over crush hazard (only for TLB model)

Roll-over crush hazard	
 TRJHE0110199(	Keep ROPS in the upright and locked position except when operating in low clearance environment. In the event of an overturn, hold on to the steering wheel and do not attempt to jump off the machine. Use extra care and do not wear seat belt when operating with ROPS folded down.

1.5.15 Operators manual

Operator manual	
 TRJHE0110343(	Read the operator manual

1.5.16 Shut off engine

Shut off engine	
 TRJHE0110371(	Shut off engine and remove key. Make sure all components have stopped rotating before you do maintenance or repair work. Let the machine cool before you do maintenance or repair work.

1.5.17 Movement hazard

Movement hazard	
 TRJHE0110343(	Before you leave the tractor, apply the parking brake, lower the implement, turn off the engine, and remove the key.

1.5.18 Crush hazard

Crush hazard	
 TRJHE0110343	Whole body crushing hazard. Stay clear of the area while the engine and machine are operating.

1.5.19 Roll-over crush hazard - slope

Roll-over crush hazard - slope	
 TRJHE0110343(	Stay off slopes too steep for operation as overturn may result.

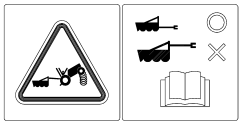
1.5.20 Fall off or run-over hazard

Fall off or run-over hazard	
 TRJHE0110343'	Do not ride on any part outside of the machine or the connected equipment. Serious injury or death can occur.

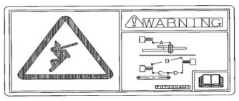
1.5.21 Entanglement hazard - power take-off

Entanglement hazard - power take-off	
 TRJHE0110200(	Entanglement hazard with PTO or driveline. Do not reach into area of moving parts.

1.5.22 Rear rollover hazard

Rear rollover hazard	
 TRJHE0110199	Do not pull from the top link. Pull only with the drawbar. Pulling from any other point can cause a roll over.

1.5.23 Component separation flying object

Component separation flying object	
 TRJHE0110343	Risk of component separation resulting in flying objects. Make sure drawbar/3-point hitch is in correct position and check length of PTO drive shaft when attaching PTO driven equipment. Read the Operator Manual for safety information and operating instructions before operating the machine.

2 Introduction

2.1 Introduction 41
2.1.1 Intended use 41
2.1.2 How to correctly discard the waste 41
2.2 Identification of the machine 42
2.2.1 Identification of the machine 42
2.2.2 Serial number plate 42
2.2.3 Engine identification 43
2.2.4 Chassis number 43
2.3 Machine components 44
2.4 California emission control warranty statement 45
2.5 United States and Canada emission control warranty statement 46

2.1 Introduction

CAUTION:
In some of the illustrations used in this Operator Manual, panels or guards may have been removed for clarity. Never operate the machine with these panels and guards removed. If the removal of a shield is necessary to make a repair, it must be replaced before operation.

CAUTION:
Read this book in its entirety prior to operating machine. Use only genuine replacement parts for repairs and/or replacement.

This manual gives the operator the proper instructions needed for operation and maintenance. Read, understand, and follow these instructions for best machine performance and life. With proper maintenance and operation procedures, the machine will have better over all performance. Use normally available tools for maintenance on this machine.

All operators must read and understand this manual before operating this machine. Where possible, operators who have not operated the machine must receive instruction from an operator who has operated this machine. Your dealer can give instruction in machine operation. Keep this manual with the machine for future reference. If the original manual is damaged, order a replacement from your dealer.

See your dealer for any service problems and adjustments. The dealer is equipped for all service work and to help with specific applications of the machine in local conditions.

Left-hand and right-hand are determined by facing the direction the machine will travel when in use.

2.1.1 Intended use

Only use this machine for usual agricultural operations.

Do not use this machine for operations other than those set out in this manual. The manufacturer accepts no liability for damage or injury caused by incorrect use of this machine.

Obey the conditions of operation, maintenance and repair (specified by the manufacturer) that are necessary for the recommended operation of this machine.

Only approved persons who know the machine (and the safety procedures) must operate, do the servicing and repair this machine.

Always obey all the safety and local regulations.

Changes made without approval on this machine release the manufacturer of all liability for caused damage or injury.

2.1.2 How to correctly discard the waste

The incorrect disposal of the waste can cause contamination to the environment. Bad equipment waste can include (but are not limited to) oil, fuel, coolant, brake fluid, filters, battery chemicals and tires.

Use a leak safe container when you drain the fluids. Do not use a food or a drink container to collect waste fluids, it can cause a person to drink from them.

Do not put or spill waste on the ground, down a drain, or into a water source.

Refrigerant for the air-conditioning can cause damage to the environment. It can be mandatory by local regulations that an approved maintenance center recover and recycle the used refrigerant.

Make a check with a local environment or recycle center on the correct procedure to recycle or discard the waste.

2.2 Identification of the machine

2.2.1 Identification of the machine

A model number and a serial number identify each machine.

Record all the numbers.

Always know the model number and serial number for your AGCO dealer when:

- You purchase parts.
- Servicing is necessary on your machine.

The machine	
Model number	
Serial number	
Date of supply	

The dealer	
Name	
Address	
Phone number	
Email address	
Fax number	

2.2.2 Serial number plate

The serial number plate (1) is located on the left-hand side of the front frame.

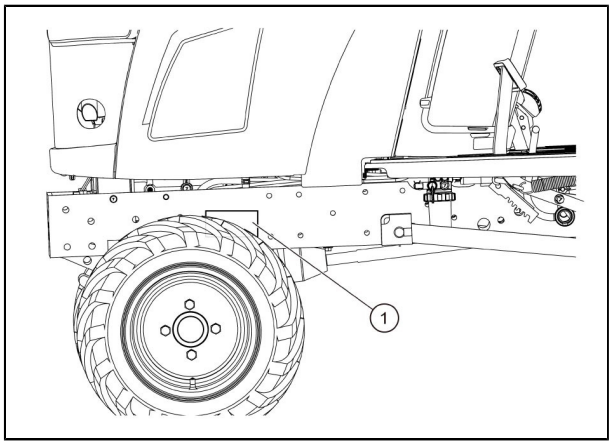


Fig. 1

The serial number plate contains the model number and serial number.

Fig. 2

2.2.3 Engine identification

The engine model number (1) is cast on the right-hand side of the engine block, below the injection pump.

The engine serial number (2) is stamped into the cylinder block, below the engine model number.

Engine model number:	
Engine serial number:	

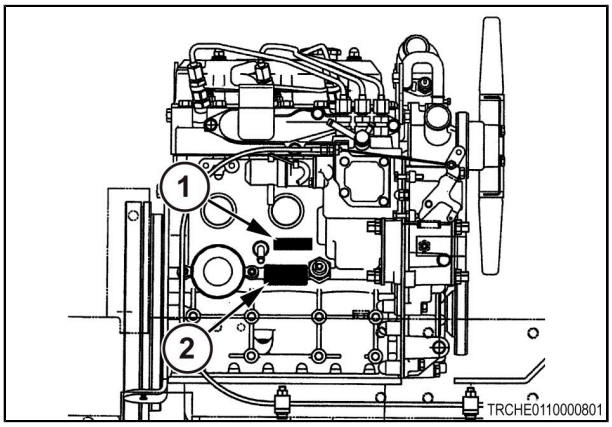


Fig. 3

2.2.4 Chassis number

The chassis number (1) is stamped in right-hand side of the front frame.

Chassis number:	

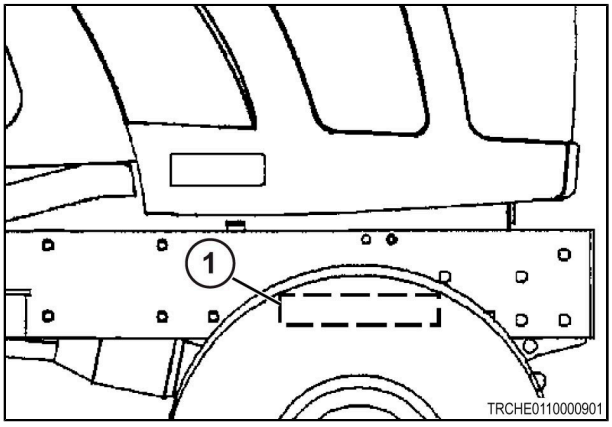


Fig. 4

2.3 Machine components

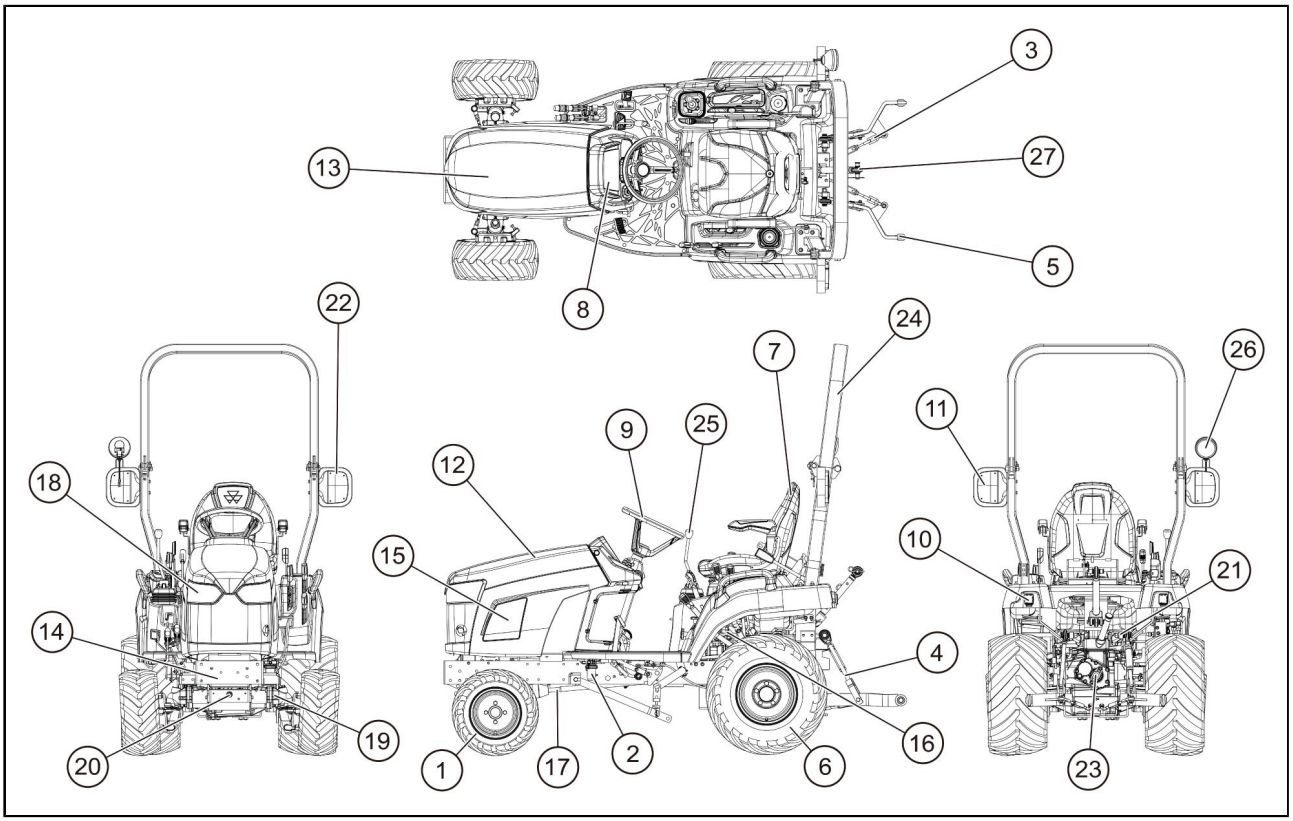


Fig. 5

(1) Front wheels
(2) Fuel filter
(3) Stabilizer
(4) Lift rod
(5) Lower link
(6) Rear wheels
(7) Operator seat
(8) Instrument panel
(9) Steering wheel
(10) Reflector
(11) Tail lamp
(12) Engine cover and front grille
(13) Battery
(14) Front bumper
(15) Engine
(16) Transmission
(17) Front wheel drive shaft
(18) Headlamp
(19) Front axle
(20) Front axle pivot
(21) Lift arm
(22) Turn/warning lamp
(23) PTO shaft
(24) Roll-over protective structure (ROPS)
(25) Joystick control lever
(26) Work lamp
(27) Top link

2.4 California emission control warranty statement

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The **California Air Resources Board (CARB)** and AGCO Corporation ("AGCO") are pleased to explain the **emission control system** warranty on Model Year 2016 and later off-road diesel engines. In California, new heavy-duty off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. AGCO must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel-injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, AGCO will repair your heavy-duty off-road engine at no cost to you including diagnosis, parts, and labor.

2.5 United States and Canada emission control warranty statement

APPLICABILITY

This section shall apply to new 1996-1999 model year and heavy duty off road compression-ignition engines and new 2000 and later model year compression-ignition engines. The warranty period shall begin on the date the engine or equipment is delivered to an ultimate purchaser. The use of alternative fuels shall not void the warranties on any engine certified to use such fuel.

WARRANTY STATEMENT

AGCO warrants to the ultimate purchaser and each subsequent owner that the compression-ignition engine and emission related parts in this equipment are designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board (ARB) pursuant to its authority in Chapters 1 and 2, Part 5, Division 26 of the Health and Safety Code provided there has been no abuse, neglect, or improper maintenance of the engine. AGCO also warrants to the ultimate purchaser and each subsequent owner that the compression-ignition engine and emission related parts in the equipment are designed, built, and equipped so as to conform with all applicable regulations adopted by the US Environmental Protection Agency, pursuant to its authority under the Federal Clean Air Act provided there has been no abuse, neglect, or improper maintenance of the engine. This warranty is effective in all states of the U.S.A. and all provinces and territories of Canada.

WARRANTY PERIOD

The warranty period for this engine's emission related parts to be free from defects in materials and workmanship which cause the failure of a warranted part to be identical in all material respects to the parts as described in the engine manufacturer's application for certification begins on the date the engine or equipment is delivered to an ultimate purchaser and continues for a period of five (5) years or 3,000 hours for 19 to 560 kW emission related parts except as noted below. In the absence of a device to measure hours of use, the engine emissions related parts shall be warranted for a period of five (5) years.

For all engines rated less than19kW, and for constant-speed engines rated under 37kW with rated speeds higher than or equal to 3000rpm, the period of two (2) years or 1,500 hours of operation, whichever occurs first. In the absence of a device to measure hours of use, the engine shall be warranted for a period of two years. If any emission related part on your engine fails within the warranty period, the part will be repaired or replaced by AGCO.

AGCO'S WARRANTY RESPONSIBILITY

Listed below are the parts covered by this warranty. Any part listed below that is subject to scheduled maintenance during the warranty period is warranted up to the first scheduled replacement point for that part. A part repaired or replaced under this warranty is warranted for the remainder of the warranty period. Parts replaced under this warranty become the property of the manufacturer. The warranted parts could include:

POWER RANGE	WARRANTY TERM	COVERED COMPONENTS
Below or equal to 19kw	2 years or 1,500 hours	Rubber Flanges, Fuel Injection Pump, Fuel Injectors, Intake Manifold, Exhaust Manifold, Nozzle Assembly, Turbo Charger (if applicable), Controlled Hot air Intake System. Miscellaneous Vacuum, temperature, and time sensitive valves and switches, Electronic control units, sensors, solenoids and wiring harnesses. Hoses, belts, connectors, assemblies, clamps, fitting, tubing, sealing , pulleys, belts and idlers, Emission Control Information Labels, Any other part with the primary purpose of reducing emissions or that can increase emissions during failure without significantly degrading engine performance.
19-37kw	5 years or 3,000 hours	Rubber Flanges, Fuel Injection Pump, Fuel Injectors, Intake Manifold, Exhaust Manifold, Nozzle Assembly, Turbo Charger (if applicable), Controlled Hot Air Intake system, Miscellaneous Vacuum, temperature, and time sensitive valves and switches, Electronic control units, sensors, solenoids, and wiring harnesses. Hoses, belts, connectors, assemblies, clamps, fitting, tubing, sealing , pulleys, belts and idlers, Emission Control Information Labels, Any other part with the primary purpose of reducing emissions or that can increase emissions during failure without significantly degrading engine performance.
37kw-Up	5 years or 3,000 hours	Fuel Injection Pump, Nozzle Assembly, Injection Pipe, Connector of Fuel Line, Intake manifold, Fuel pipe Assembly, Inlet Pipe, Inlet Pipe band, air cleaner element, fuel filter element, turbocharger systems, exhaust manifold, hoses, clamps, connectors, and sealing gaskets of devices used in systems above, catalysts, Electronic control units and sensors**, cold start enrichment system, charge air cooling system, controlled hot air intake system, catalytic converter, exhaust manifold, regenerators, oxidizers, fuel additive devices, and any other device used to regenerate or aid in the regeneration of the particulate control device, smoke puff limiters, selective catalyst reduction, reductant (DEF) containers/dispensing systems, Miscellaneous Vacuum, temperature, and time sensitive valves and switches, solenoids, and wiring harnesses. Hoses, belts, connectors, assemblies, clamps, fitting, tubing, sealing, gaskets or devices and mounting hardware, pulleys, belts and idlers, Emission Control Information Labels, Any other part with the primary purpose of reducing emissions or that can increase emissions during failure without significantly degrading engine performance.

NOTE: Filters that are replaced as part of normal scheduled maintenance are NOT covered by emissions warranty. These parts are listed as, but not limited to, engine air filter, oil filter, fuel filter, DEF filters, etc.

** SENSORS RELATING TO EMISSION COMPONENTS ONLY

Repair or replacement of any warranted part under the warranty provisions of this statement shall be performed at no charge to the owner at an authorized warranty station.

The owner shall not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at an authorized warranty station.

OWNER MAINTENANCE AND REPAIR RESPONSIBILITY

The engine owner is responsible for the proper use and maintenance of the engine, as specified in the Operator's Manual. AGCO reserves the right to deny coverage under this warranty if the owner has not properly maintained the engine and/or emission related parts and failure occurs due to neglect, abuse, and/or unapproved modifications.

AGCO is not responsible for resultant damage to an emission-related part or component resulting from:

- Any application or installation AGCO deems improper
- Attachments, accessory items or parts not sold nor approved by AGCO.
- Improper engine maintenance, repair or abuse
- Owner's unreasonable delay in making the product available after being notified of a potential product problem.

AGCO shall be liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.

This warranty is in addition to AGCO Standard Warranty.

AGCO recommends that the original owner keep the original purchase receipt (with the date of initial purchase), and all repair receipts and maintenance records, and transfer them to any subsequent owner.

However, AGCO will not deny warranty claims solely for the lack of receipts or failure to document the performance of all scheduled maintenance. The engine owner is responsible for presenting the engine to the nearest Dealer or service station authorized by AGCO when a problem exists.

Subject to the limitations above, non-warranty maintenance or repair of emission control parts on this engine may be performed by the owner, or by any repair establishment or individual, without affecting coverage under this warranty; however, reimbursable warranty repairs must be performed by a dealer or service center authorized by AGCO or the manufacturer of this equipment.

The use of parts that are not equivalent in performance and durability to genuine parts may impair the effectiveness of the emission control system and prevent coverage under this warranty. If non-genuine AGCO parts are used for maintenance or replacement on this engine, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to genuine parts in performance and durability.

EMISSION WARRANTY EXCLUSIONS

This warranty shall not cover any of the following:

- Conditions resulting from tampering, misuse, abuse, improper adjustment, engine alteration, use of modified parts, use of replacement parts that are not the same in performance and durability as genuine replacement parts, failure to use the recommended fuel or oil, use of unapproved fuel or oil additives, or failure to perform required maintenance.
- Consequential damages such as loss of time, inconvenience, or loss of use of this engine or equipment.
- Damages or repair costs caused by the owner's unreasonable delay in making the engine available for warranty inspection and repair.
- Repairs not covered by this warranty, and diagnosis or inspection fees that do not result in eligible warranty service being performed.
- Any replacement with non-genuine parts or malfunction of genuine parts due to use of non-approved parts

The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty claim.

- Travel Time and Mileage *
- Freight *

* Unless mandated by State or Provincial laws.

OBTAINING WARRANTY SERVICE

All repairs qualifying under this limited warranty must be performed by a Dealer or service center authorized by AGCO or the manufacturer of this equipment.

To obtain warranty service, owner should take the engine to the nearest Dealer or service center authorized by AGCO or the equipment manufacturer. If available, the original purchase receipt (showing the initial date of purchase) and all available maintenance records should be presented.

The authorized AGCO dealer will contact AGCO Warranty Department for confirmation of coverage.

The authorized Dealer or service center may perform the necessary repairs or adjustments within a reasonable time and furnish owner with a copy of the repair order. AGCO wants to assist in providing the services applicable under this warranty. If you need assistance in locating the nearest authorized Dealer or service center, or have any questions about your warranty rights and responsibilities, you should contact AGCO Answers at **1-877-525-4384** or email agcoanswers@agcocorp.com

3 Operation

3.1 Machine operation controls 51
3.1.1 Locations of controls 51
3.2 Instrument panel and components 52
3.2.1 Instrument panel 52
3.2.1.1 Indicators and gauges 53
3.2.2 Ignition switch 55
3.2.3 Lamp switches 55
3.3 Brake pedal and parking brake 56
3.4 Seat 57
3.4.1 Adjust the seat 57
3.4.2 Rotate the seat for backhoe operation (only for TLB models) 57
3.4.3 Rotate the seat for tractor operation 59
3.5 Steering wheel 62
3.5.1 Adjust the steering wheel tilt 62
3.5.2 Adjust the steering wheel tilt lever 62
3.6 Electrical power outlet - 12V socket 64
3.7 Aux. power outlet 65
3.8 Engine cover 66
3.8.1 Open the engine cover 66
3.9 Break-in the tractor 67
3.10 Start the tractor 68
3.10.1 Examine before operation 68
3.10.2 Start the tractor - normal conditions 69
3.10.3 Cold weather starting 70
3.10.4 Warm engine starting 70
3.10.5 Warm up period 70
3.10.6 General operating information 71
3.10.7 Examine the neutral start system 71
3.11 Engine speed control 73
3.12 Ground speed controls 74
3.12.1 Range gear shift lever 74
3.12.2 Hydrostatic pedals 74
3.12.3 Ground speed chart 74
3.12.4 Set the cruise control lever 75
3.13 Stop the engine 77
3.14 Engage the differential lock 78
3.15 Four-wheel drive 79
3.16 Power take-off 80
3.16.1 Power take-off controls 80
3.16.2 Rear power take-off shaft 81
3.16.3 Mid power take-off shaft 82

3.17 3-point linkage 83
3.17.1 3-point linkage controls 83
3.17.2 Linkage assembly 85
3.17.3 Connect implements 85
3.17.4 Disconnect implements 86
3.18 Joystick 87
3.18.1 Joystick control lever 87
3.18.2 Joystick operation 87
3.18.3 Joystick lockout 88
3.18.4 Hydraulic ports 89
3.19 Roll-over protective structure 90
3.20 Transport on a trailer 91
3.21 Auxiliary hydraulic system 92

3.1 Machine operation controls

3.1.1 Locations of controls

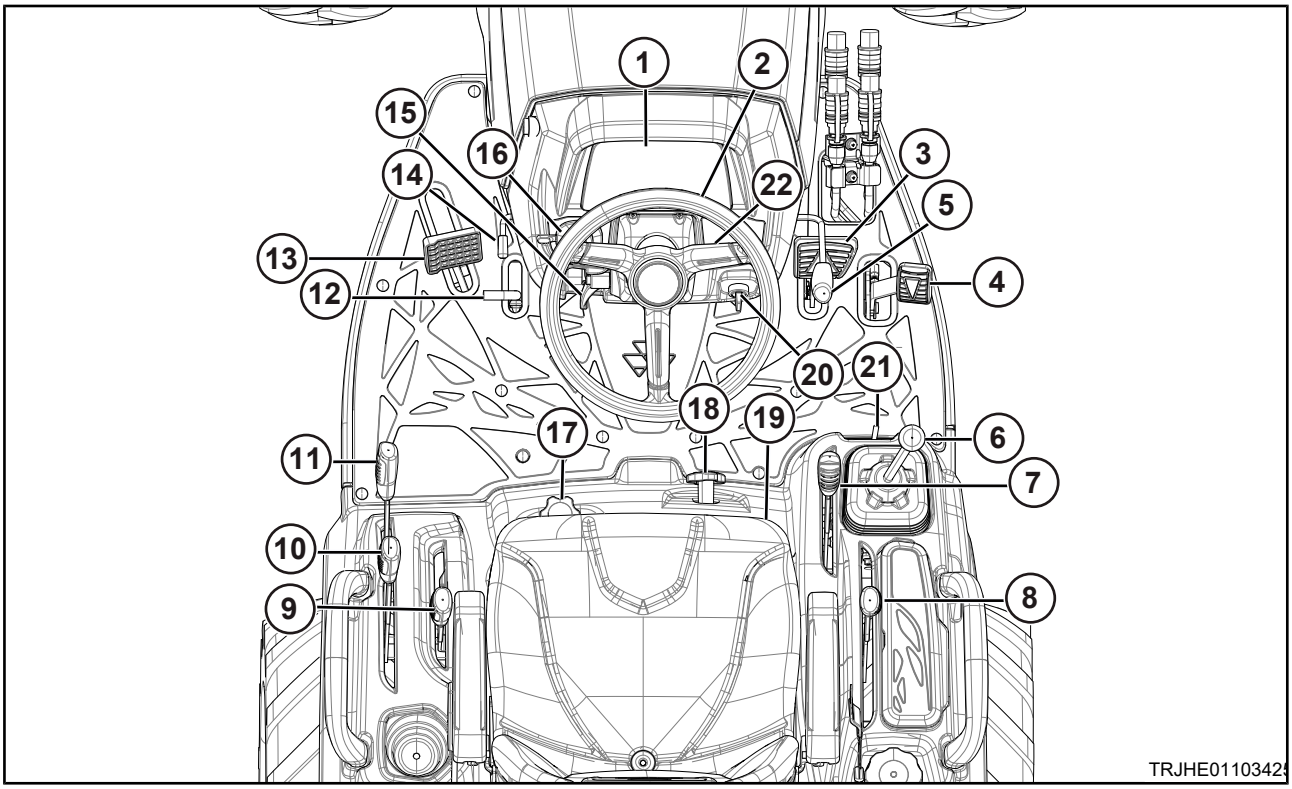


Fig. 1

CAUTION:
Know the controls before you operate the tractor.

(1) Instrument panel
(2) Steering wheel
(3) Forward hydrostatic pedal
(4) Reverse hydrostatic pedal
(5) Hand throttle lever
(6) Joystick control lever
(7) 3-point linkage lift control lever
(8) Range gear shift lever
(9) Power take-off (PTO) clutch lever
(10) Rear power take-off (PTO) selector lever
(11) Mid power take-off (PTO) selector lever
(12) Differential lock pedal
(13) Brake pedal
(14) Parking brake lever
(15) Steering wheel tilt lever
(16) Lamp switches
(17) Cut height control knob
(18) Lowering rate knob
(19) Four-wheel drive (4WD) shift lever
(20) Main switch
(21) Joystick lockout
(22) Cruise control lever

3.2 Instrument panel and components

3.2.1 Instrument panel

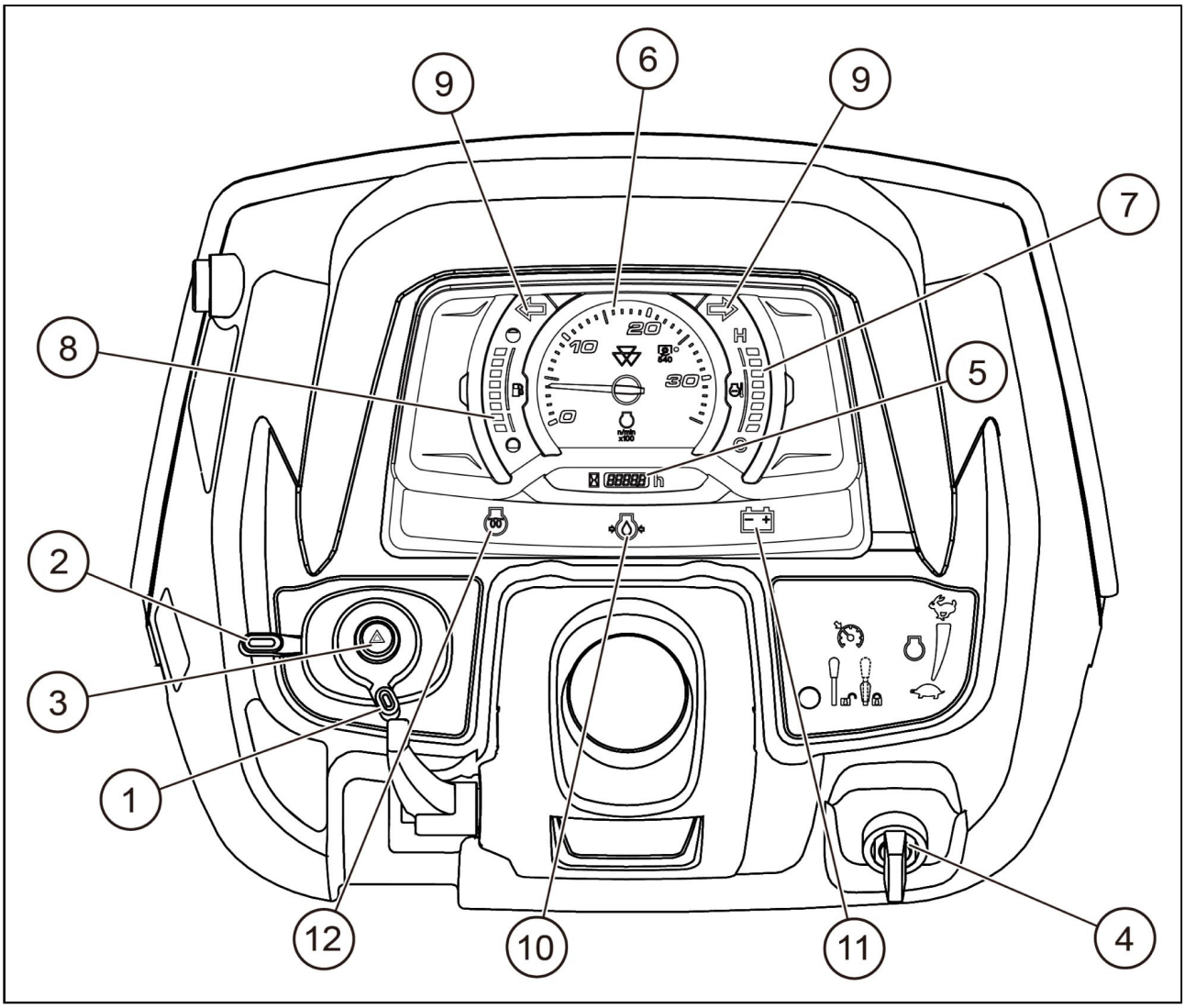


Fig. 2

(1) Headlamp switch
(2) Turn switch
(3) Hazard lamp switch
(4) Main switch
(5) Hazard switch
(6) Tachometer
(7) Coolant temperature gauge
(8) Fuel gauge
(9) Turn (signal/hazard) indicator lamps
(10) Engine oil pressure lamp
(11) Battery charge lamp
(12) Glow lamp

NOTE: *Instrument panel and switches can vary from what is shown.*

3.2.1.1 Indicators and gauges

Indicators

The battery charge lamp (1) illuminates when the main switch is turned to the on position. The lamp will go out after the engine starts, to indicate the battery is being charged.

The engine oil pressure lamp (2) illuminates if engine oil pressure is low. If the lamp comes on while the engine is running, stop the engine immediately and find the cause.

IMPORTANT: *If the battery charge lamp or engine oil pressure lamp stays illuminated, stop the engine immediately and contact your dealer.*

The turn signal/hazard lamps (3) flash when a turn signal is in the on position or the hazard switch is in the on position.

The glow lamp (4) illuminates when the main switch is in the glow position.

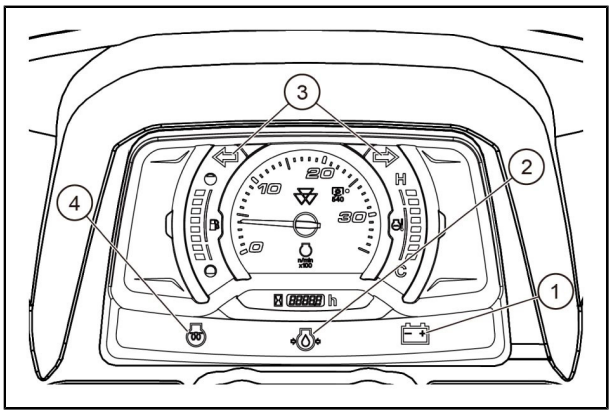


Fig. 3

Coolant temperature gauge

The coolant temperature gauge lamps (1) indicate the temperature of the engine coolant.

Cold (2) indicates the engine temperature is too cool for a heavy work load. Let the engine warm (the gauge lamps around center position come on) before applying a heavy load.

Hot (3) indicates the engine is hot for a heavy work load. Let the tractor run at no load for several minutes. Stop the engine and find the cause.

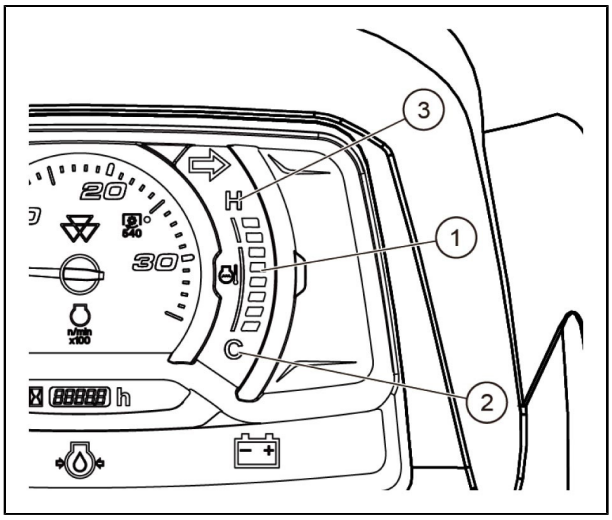


Fig. 4

Tachometer and hourmeter

The needle (1) and scale on the gauge indicates engine speed on crankshaft revolutions per minutes (RPM).

The dot (2) on the gauge indicates 540 PTO speed for MF17GC.23. The dot (4) on the gauge indicates 540 PTO speed for MF17GC.25.

The hourmeter (3) in the center of the gauge indicates engine and tractor use to help in maintenance intervals. The extreme right digit indicates 1/10 hour increments.

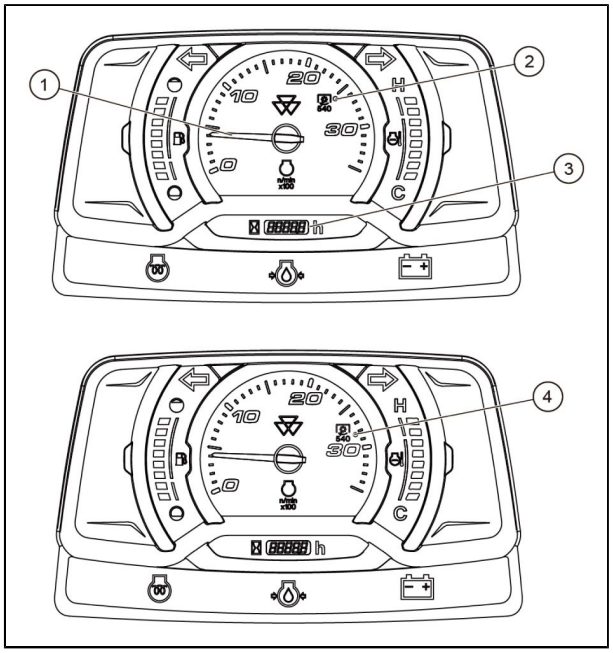


Fig. 5

Fuel gauge

When the main switch is in the on position, the fuel gauge lamps (1) indicate the diesel fuel level.

When the top gauge lamp which is below the full icon (2) comes on, it indicates that the fuel tank is almost full.

The gauge lamps go off from the top as the fuel level decreases. When only the bottom lamp above the empty icon (3) remained on, fill the fuel tank.

NOTE: *The gauge does not indicate an accurate fuel level when the tractor is on a slope. A short time is needed to indicate an accurate level after the tractor gets back onto level ground.*

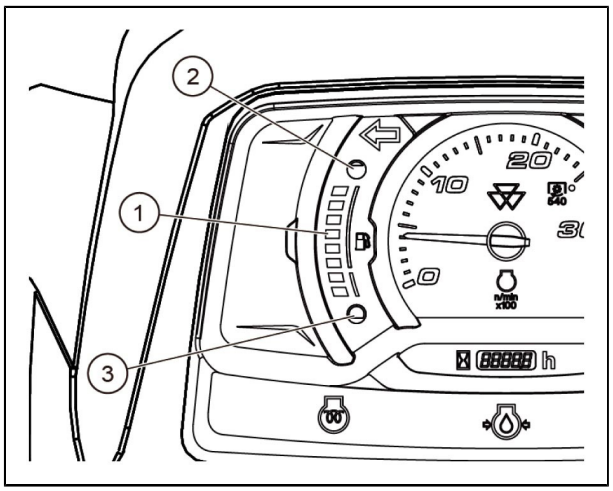


Fig. 6

3.2.2 Ignition switch

The ignition switch (1) has the four following positions:

Off (stop) - Engine and all electrical circuits are off. The key can be removed.

On - Power is supplied to all circuits. This is the normal operating position.

Glow - Energizes glow plugs to warm the combustion chambers and help with starting. This position is spring-loaded to the on position.

Start - Starter is activated. This position is spring-loaded to the on position.

NOTE: *The ignition switch must be turned to the on position before any circuits will operate.*

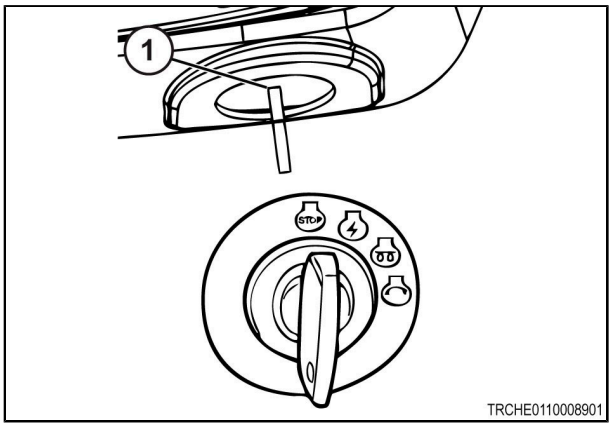


Fig. 7

3.2.3 Lamp switches

(1) Headlamp switch - off and on positions
(2) Turn switch

- Right-hand turn - up position
- Off - center position
- Left-hand turn - down position

NOTE: *The turn indicators will not turn off automatically. Return the turn indicator switch to the center position after turning the machine.*

(3) Hazard switch - engages the warning lamps

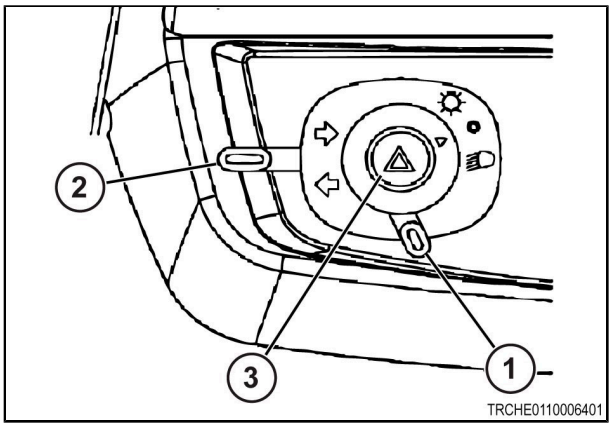


Fig. 8

3.3 Brake pedal and parking brake

The brake pedal (1) controls the left and right wheel brakes at the same time.

To apply the parking brake:

- Press and hold the brake pedal
- push down on the parking brake lever (2).
- release the brake pedal then the parking brake lever.

To disengage the parking brake, press the brake pedal. This will release the locking mechanism.

NOTE: *Disengage the parking brake before you drive the tractor.*

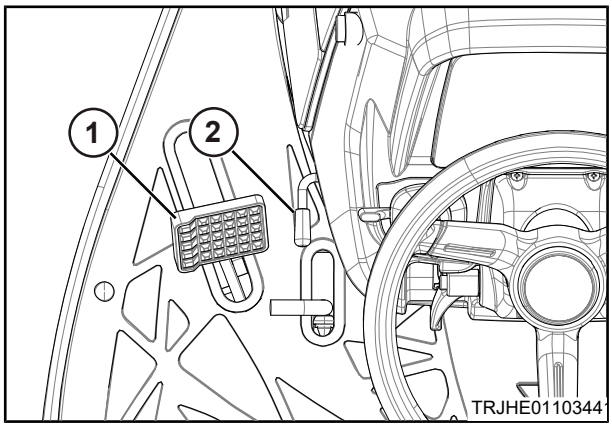


Fig. 9

3.4 Seat

3.4.1 Adjust the seat

CAUTION:
Do not make seat adjustments while tractor is in motion. Make sure the seat is locked in place before you operate the machine.

Procedure

1. Lift the seat latch lever (1).
2. Move the seat forward or rearward.
3. Release the seat latch lever.
4. Make sure the seat is latched.

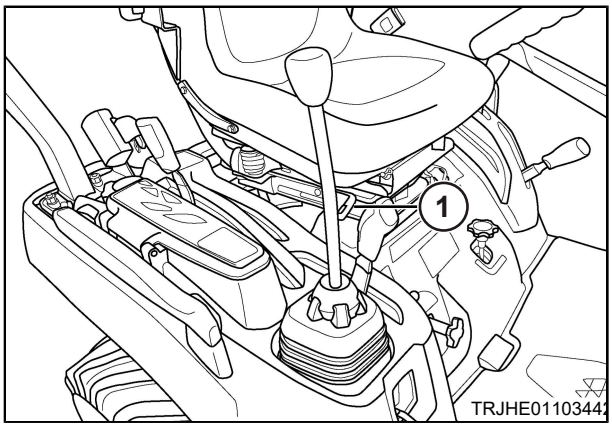


Fig. 10

3.4.2 Rotate the seat for backhoe operation (only for TLB models)

This operator seat function is only to be used when operating an installed backhoe.

Procedure

1. Lift the lever (1). The operator seat bracket will be released from the front guide tab (2) automatically.

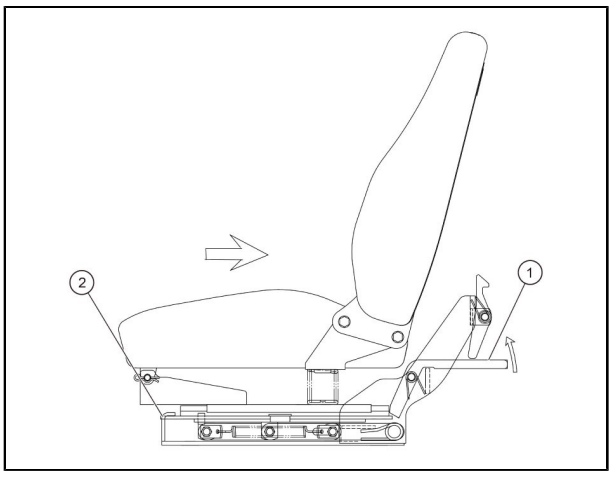


Fig. 11

2. Then, the spring raises the seat automatically.

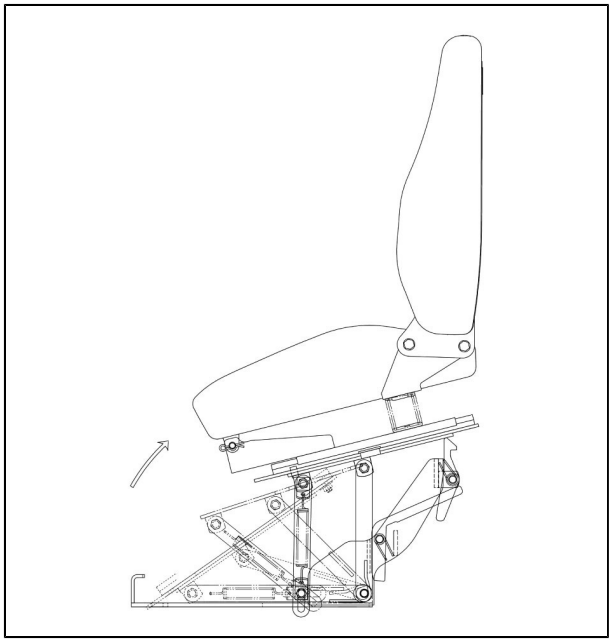


Fig. 12

3. Rotate the seat 180 degrees counterclockwise to face the backhoe direction, when the seat is at the top position.

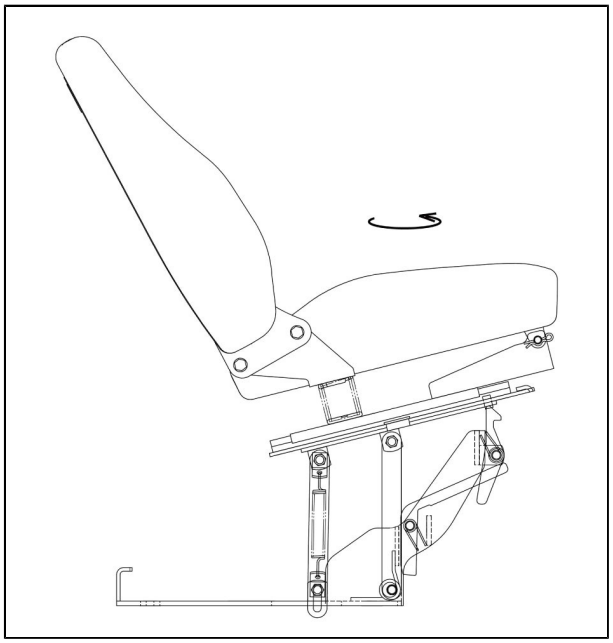


Fig. 13

4. Push down on the seat and make sure that the latch (1) can lock the notch (2).

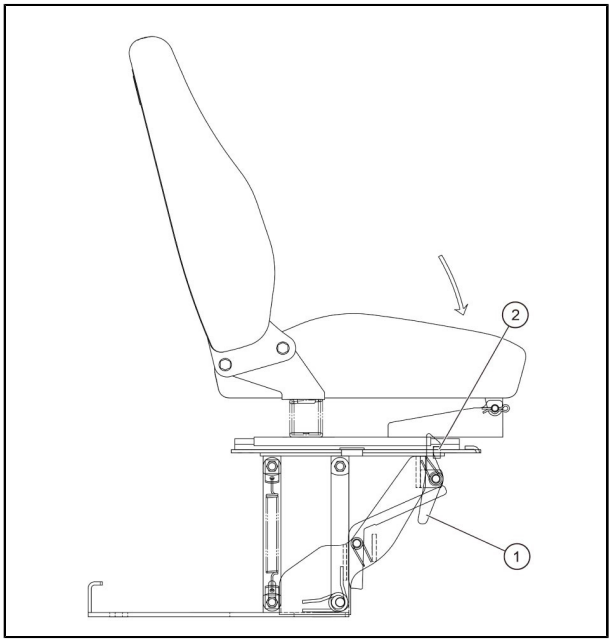


Fig. 14

3.4.3 Rotate the seat for tractor operation

Procedure

1. Press the latch (1) to release the operator's seat.

Fig. 15

2. Raise the seat to the top position and rotate it 180 degrees clockwise to the original direction.

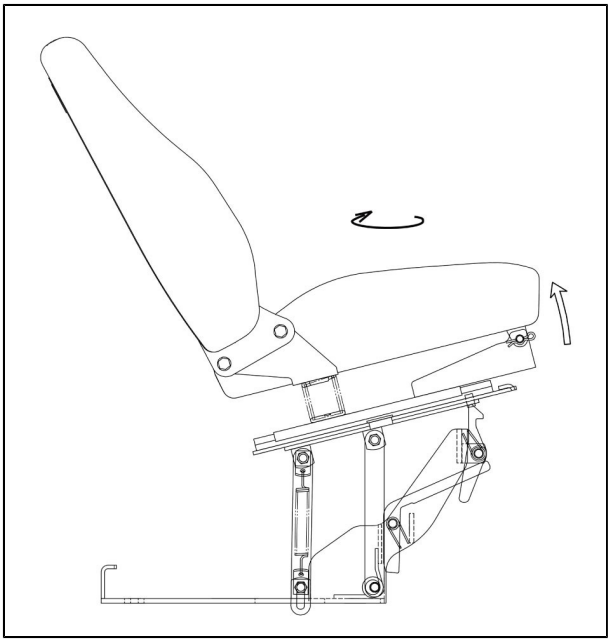


Fig. 16

3. Push down the seat bracket front (1) to make it lower than the front guide tab (2).

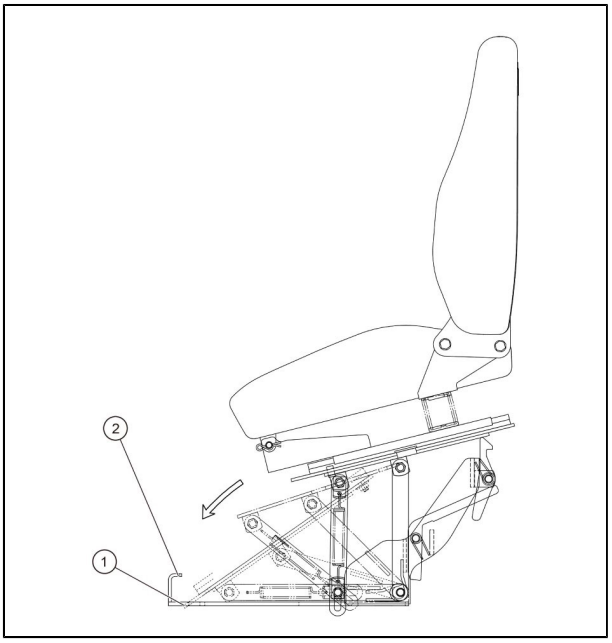


Fig. 17

4. Press the rear of the operator seat down and push the seat forward. Then, the seat bracket front (3) will be locked with the front guide tab (2). The lever (1) will keep the seat in the locked position at the same time.

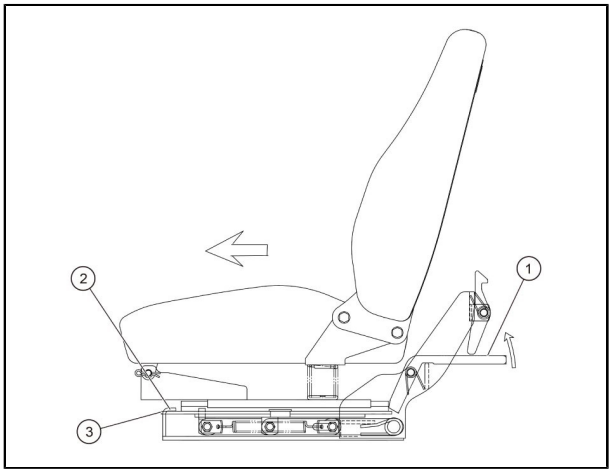


Fig. 18

3.5 Steering wheel

3.5.1 Adjust the steering wheel tilt

CAUTION:
Stop the tractor before you adjust the steering wheel tilt.

Procedure

1. Hold the steering wheel with your right hand.
2. Turn the steering wheel tilt lever (1) counterclockwise in the right figure.
3. Tilt the steering wheel to a desired position.
4. Turn the steering wheel tilt lever clockwise to the locked position.
5. Make sure that the steering wheel tilt is locked into position.

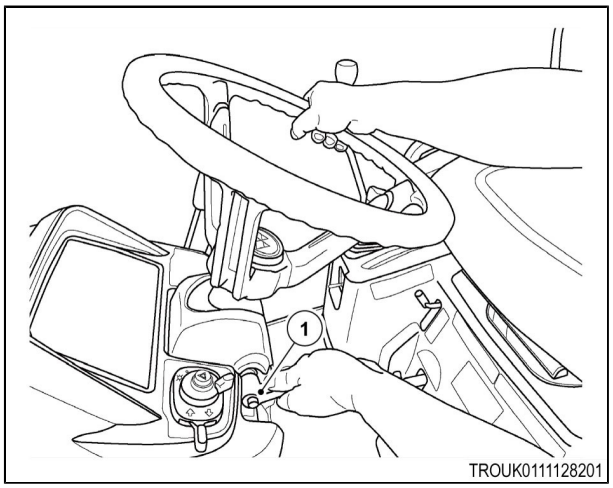


Fig. 19

3.5.2 Adjust the steering wheel tilt lever

Do this procedure, when the steering wheel tilt lever can not be tightened or loosened sufficiently.

CAUTION:
Stop the tractor before you adjust the steering wheel tilt lever.

Procedure

1. To loosen the steering wheel tilt lock:
   a) While pressing the button (1) of the steering wheel tilt lever (2) with your thumb, gently pull the lever to the left-hand side.
   b) With keeping pulling this lever, it can be turned to adjust the tightness of itself, without loosening the steering wheel tilt.
   c) Repeat until the steering wheel tilt lever is loose.

   IMPORTANT: *Do not turn the tilt lever more than 540 degrees. The steering wheel tilt lever can fall off from the steering column.*

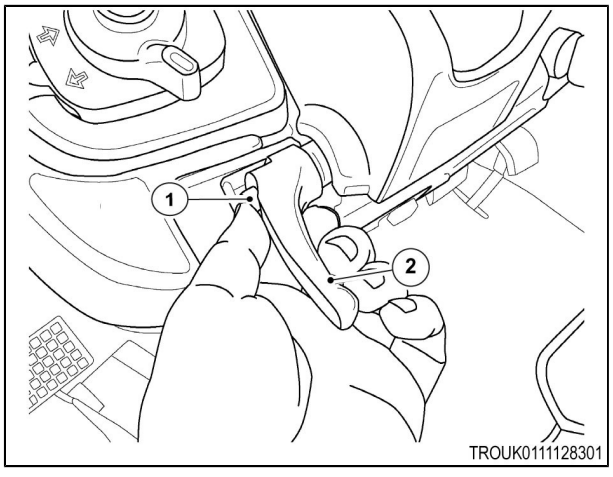


Fig. 20

2. To tighten the steering wheel tilt lock:

   a) While pressing the button (1) of the steering wheel tilt lever (2) with your thumb, gently pull the lever to the left-hand side.

   b) With keeping pulling this lever, it can be turned to adjust the tightness of itself, without tightening the steering wheel tilt.

   c) Repeat until the steering wheel tilt level becomes tight.

   d) After locking this lever, make sure that the steering wheel tilt is locked into position.

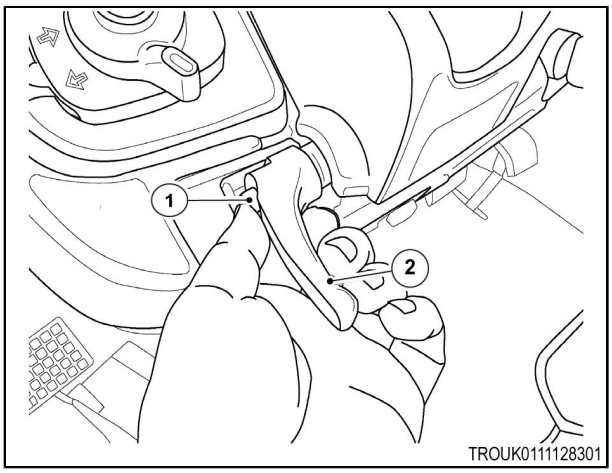


Fig. 21

3.6 Electrical power outlet - 12V socket

The 1GC25 tractor is equipped with a 12V socket outlet (1). To access the 12V socket, open the cover on the storage compartment on the right fender and remove the cap on the 12V socket.

Disconnect your accessory from the 12V socket when not in use.

CAUTION:

Do not connect a lamp or a load of more than 120 watts.

Do not use as a cigarette lighter.

WARNING:
Do not use the 12V socket when it is wet.

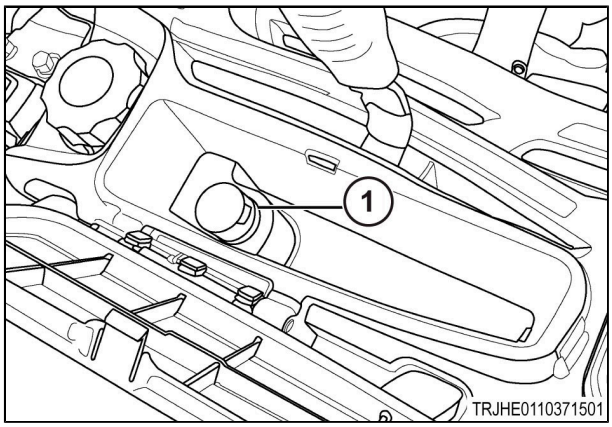


Fig. 22

3.7 Aux. power outlet

The power outlet (1) is arranged near the lower side of the alternator on the front right hand side, for a front implement.

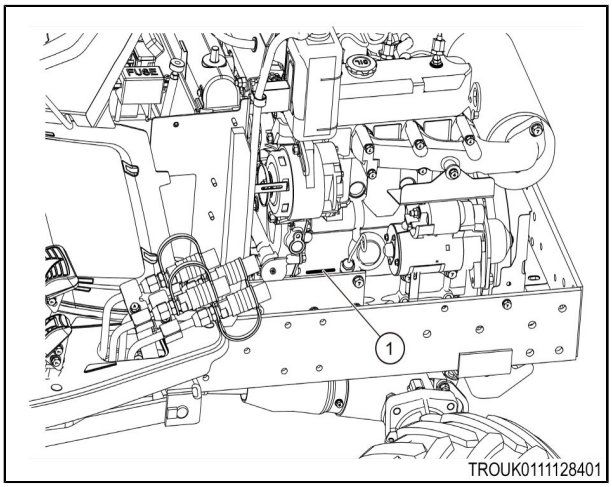


Fig. 23

3.8 Engine cover

3.8.1 Open the engine cover

Open the engine cover to access the radiator, battery, and engine components.

Procedure

1. Press the release button for the engine cover.

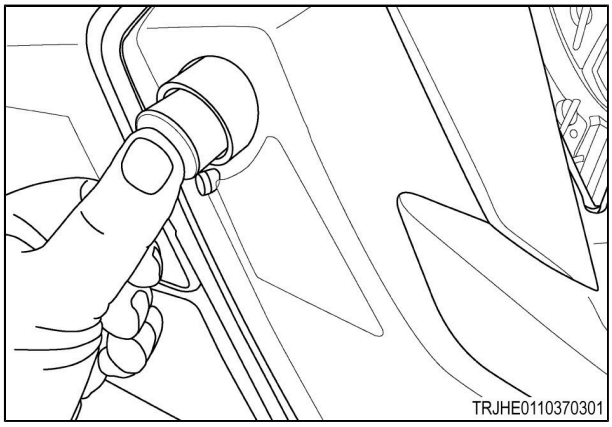


Fig. 24

2. Lift the engine cover up and forward.

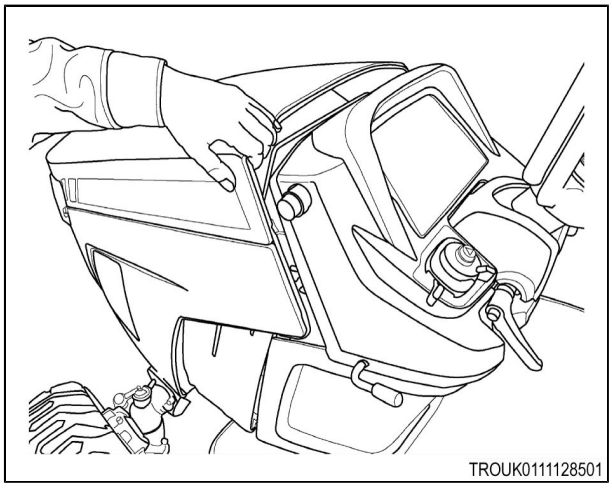


Fig. 25

3. Use the rod to hold the engine cover at a 45 degree angle.
   a) Remove the J hook side of the rod from the engine cover.
   b) Slide the J hook end through the eyelet on the engine.
4. After maintenance, put the rod back into the storage position on the engine cover.
5. Push the engine cover rear lightly, to close and lock the cover.

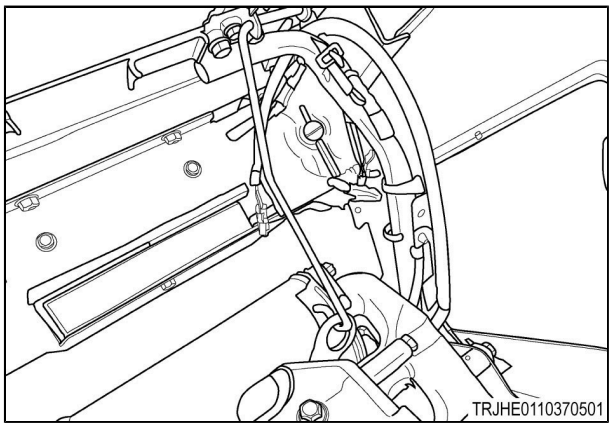


Fig. 26

3.9 Break-in the tractor

Correct operation of the tractor during the first 50 hours contributes the performance and life of the engine and tractor.

IMPORTANT: *The correct maintenance and lubrication procedures are important and required for correct operation.*

- Operate the engine at full speed.
  Prevent excessive load on the engine. If the engine speed decreases too far, operate in a lower gear to keep higher engine speed.
- Check the coolant level and all oil levels frequently during the break-in period.
  Watch for leaking of fluids. Fill the fluid levels as required, and repair any leaks.
- Tighten any nuts, bolts, or screws that have loosened, especially wheel retaining bolts.
  Check the torque on the wheel bolts after 10 hours of operation.

  NOTE: *All fasteners on this machine are metric.*
- Adjust the brake linkage as necessary.
  During the first hours of operation, lining materials will wear to adjust to the surface of the brake discs. This process can make early adjustment necessary.
- If equipped with a clutch, adjust the clutch pedal free play as necessary.
  During the first hours of operation, lining materials will wear to adjust to the surface of the clutch discs. This process can make early adjustment necessary.
- Keep the area around fuel tank filler clean. Make sure diesel fuel is of correct grade and free of contamination.
- Do the required initial maintenance after the first 50 hours of operation. This includes changing the engine oil and oil filter.

3.10 Start the tractor

Before starting the procedure

DANGER: A potential general safety hazard.

Personal injury or death can occur.

Follow correct operation, lubrication, maintenance or repair of machine procedures.

WARNING: Inhalation hazard.

Death or serious illness can occur.

Adequately ventilate the area.

DANGER: Machine movement hazard.

Personal injury, death, or machine damage can occur.

Always start the machine from the operator's seat. Do not allow anyone on the machine except for the operator.

3.10.1 Examine before operation

Use the following list to examine the machine daily before starting.

- Make sure all the safety shields are in position and fastened correctly.
- Make sure the operator has instructions on the correct and safe operation of the machine and any attachments or implements.
- Examine the coolant, engine oil, and transmission oil levels. Fill as necessary.
- Examine the engine belt tension and adjust as required.
- Make sure the radiator, air intake screens, and radiator screen are clear of debris to supply maximum engine cooling.
- Examine the operation of the brake, and the throttle controls. All controls must operate freely and be adjusted correctly.
- Make a general inspection of the tires, the tire pressure, and the wheel bolt torque.
- Look for any leaks and correct before operating the machine.
- Make sure that the steering is not too loose.
- If equipped with hydrostatic controls, make sure the machine stops when the hydrostatic pedals are in the neutral position.
- Examine the fuel level. Keeping the fuel tank full while not in operation will reduce condensation and supply a full tank for the next use.
- Examine the operation of the lamps and the warning flashers. If the machine is operating on public road, make sure the slow moving vehicle emblem is in position.

  NOTE: *Local laws can be different for the use of the warning flashers and the slow moving vehicle emblem. Examine the local laws.*

3.10.2 Start the tractor - normal conditions

Procedure

1. Press the brake pedal (1) and apply the parking brake.
2. Put the range gear shift lever (2) in the neutral position.
3. Make sure the PTO clutch lever (3) is in the off (rear) position.
4. Make sure the hydrostatic pedals (4) are in the neutral position.
5. Put the lift control lever (5) in the down position.
6. Move the hand throttle lever (6) to the middle position.

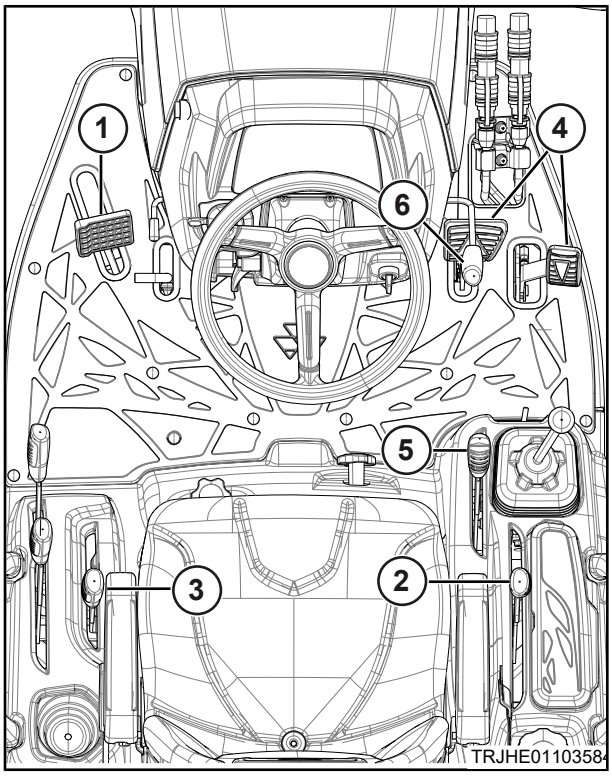


Fig. 27

7. Turn main switch to the right to on position (1) for 1 to 2 seconds.
8. Turn the main switch to glow position (2) for 5 to 7 seconds.
9. Turn the main switch to the start position (3). Release the main switch at the moment engine starts.
10. When the engine runs smoothly, set the engine speed to approximately 1500 rpm to let the engine and the hydraulic system warm for several minutes. Do not load a cold engine.

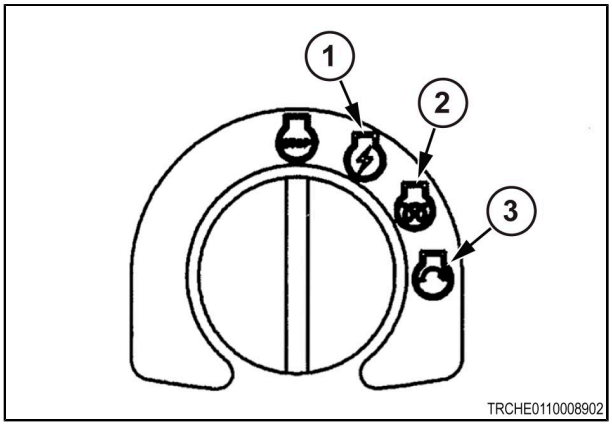


Fig. 28

After finishing the procedure

The battery charge lamp (1) and engine oil pressure lamp (2) in the instrument panel must go out when the engine starts. If either lamp remains illuminated, stop the engine immediately and find the cause of the problem.

If the engine will not start and run after several tries, bleeding air from the fuel system can be necessary.

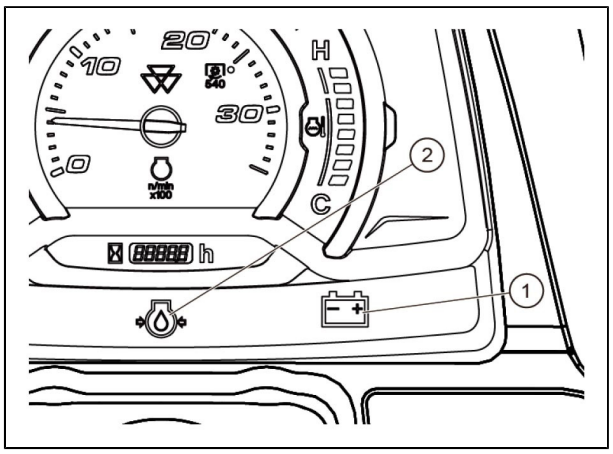


Fig. 29

3.10.3 Cold weather starting

To start an engine in colder ambient temperatures, use the same procedure as for normal conditions except for the following:

- Preheat the engine. Turn the ignition switch to the on position for 10 to 30 seconds.
- At temperatures below 4 °C (39 °F) use No. 1 (No. 1-D) diesel fuel because of possible fuel gelling characteristics of No. 2 (No. 2-D) fuel at cold ambient temperature.
- Additional warm up time is necessary for the central hydraulic reservoir because of colder (thicker) oil. The central hydraulic reservoir supplies the hydraulic fluid, and the lubrication to the transmission and the center housing.
- Check all the controls (steering, braking, etc.) before operating the machine.

NOTE: *Installation of an accessory engine block heater can be necessary in cold weather conditions. See your dealer.*

IMPORTANT: *Do not use ether or any other starting fluid to start engines.*

The glow plugs are on when the starter is trying to start the engine. Crank the engine for a maximum of 30 seconds if necessary. If the engine does not start after 30 seconds:

1. Turn the ignition switch off for ten seconds.
2. Turn the ignition switch to the start position to engage the starter.
3. Release the switch when the engine starts or after 30 seconds.

If a booster battery is necessary to start the tractor, connect the booster battery in parallel. Always connect the positive (+) terminals together first. Then install the booster cable on the booster battery negative (-) terminal and ground the booster cable end on the tractor away from the tractor battery.

3.10.4 Warm engine starting

Use the normal starting procedure, but do not use the engine preheating system.

3.10.5 Warm up period

IMPORTANT: *Not following the correct warm up procedures can result in severe engine damage, hydraulic pump seizure, driveline bearing or gear damage, and/or sluggish steering or braking.*

After starting a cold engine, let the engine idle at slow speed to make sure all engine components are lubricated.

In colder ambient temperatures, extended warm up will be required to also warm hydraulic fluid and lubricate driveline components.

Ambient temperature	Warm up time
0 °C and up (32 °F and up)	5 to 10 minutes
0 to -10 °C (32 to 15 °F)	10 to 20 minutes
-10 to -20 °C (15 to -5 °F)	20 to 30 minutes
-20 °C and less (-5 °F and less)	30 or more minutes

Warm up period recommendation

3.10.6 General operating information

WARNING: Hot components can burn.

Severe personal injury can result.

Let the engine and components cool before doing maintenance.

Examine these items during operation:

- The engine oil pressure lamp will illuminate if the engine oil pressure is low. Stop the engine immediately and find the cause.
- The battery charge lamp will illuminate if the battery is not being charged properly. Stop the engine and find the cause.
- The coolant temperature gauge/lamp will indicate hot if the engine is too hot. Stop the engine, let the engine cool, and find the cause.
- Fill the fuel tank before the fuel gauge reaches the empty position. Running out of fuel will result in the need to bleed air from the fuel system.

3.10.7 Examine the neutral start system

Before starting the procedure

WARNING:
Do not bypass or modify the neutral switch. If the neutral start system does not operate correctly, see your dealer immediately.

The tractor is equipped with a neutral start system. To start the tractor:

- Put the range gear shift lever in the neutral position.
- Put the power take-off (PTO) clutch lever in off position.

IMPORTANT: *Make sure no bystanders or obstructions are around the tractor, in case there is unexpected movement of the tractor.*

Examine start circuit daily for correct operation.

Procedure

1. Press the brake pedal. Try to start the engine with the range gear shift lever in a gear range and the PTO clutch lever in off position.

   Result

   The starter must not engage.

2. Press the brake pedal. Try to start the engine with the range gear shift lever in neutral and the PTO clutch lever in the on position.

   Result

The starter must not engage.

3. Press the brake pedal. Try to start the engine with the gear shift lever in neutral and the PTO clutch lever in the off position.

   Result

   The starter must engage.

After finishing the procedure

If the neutral start system does not operate correctly, the neutral start system must be repaired immediately.

The seat safety switch requires the operator to remain seated at all times. The engine will automatically stop approximately three seconds after the operator leaves the seat. Do not leave the seat while you operate the tractor.

3.11 Engine speed control

CAUTION:

Always select engine speed appropriate for the task. Reduce speed before you turn or backup the tractor.

The hand throttle lever (1) controls the engine speed and will stay in the position set by the operator.

- Move hand throttle lever rearward to decrease the engine speed.
- Move hand throttle lever forward to increase the engine speed.

With the hand throttle lever rearward, the engine will be at low idle.

The hydrostatic transmission works best when the engine speed is at or above 2400 rpm.

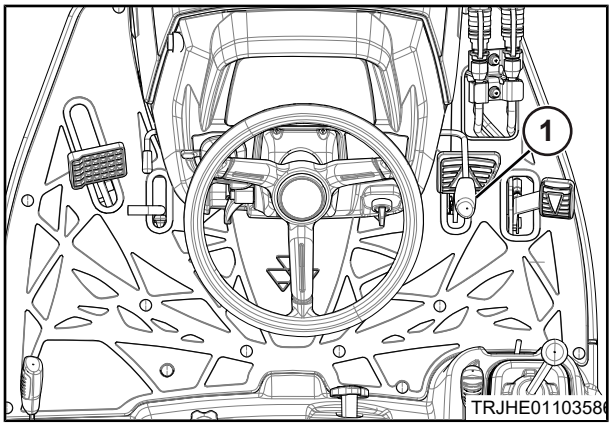


Fig. 30

3.12 Ground speed controls

3.12.1 Range gear shift lever

The range gear shift lever is used to select a range of ground travel speeds through different gear reductions within the drive train. A hydrostatic control unit has infinitely variable speeds, from zero to top speed in each range gear.

The range gear shift lever (1) is located to the right of the operator seat, and supplies two major speed changes. This lever has tortoise (slow), neutral, and hare (fast) positions.

IMPORTANT: *Completely stop all the machine movement before you shift the range gear shift lever.*

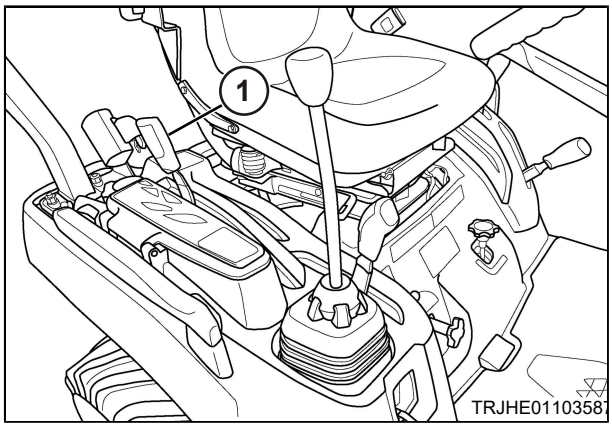


Fig. 31

3.12.2 Hydrostatic pedals

The hydrostatic pedals are located on the right side of the platform. The pedals operates the hydrostatic unit in forward or reverse travel direction, when the range gear shift lever is in the tortoise (slow) or hare (fast) position.

- Press the forward pedal (1) to move the machine forward.
- Press the reverse pedal (2) to move the machine rearward.
- Ground speed will increase as the pedal is pressed.

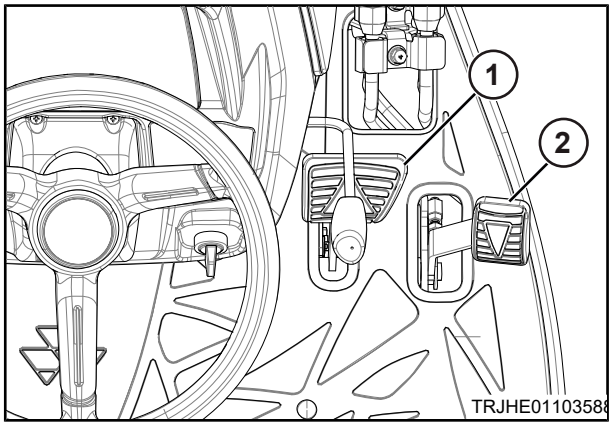


Fig. 32

When the pedal is released, the spring-loaded pedal will return to the neutral position. The machine will slow, then stop when the hydrostatic neutral position is reached. When the pedal is completely released and in the neutral position, the machine will remain stopped.

CAUTION:

The hydrostatic unit will not stop the tractor when on a slope. Use the brakes to stop and hold the machine when on a slope.

For maximum response, keep the engine speed above 2400 rpm when operating the hydrostatic pedal. When starting on an upward slope, increase the engine speed to high idle.

3.12.3 Ground speed chart

Gear arrangement with the proper ground speeds, in order from slow to fast, are shown in the chart.

NOTE: *Ground speed indicated at 2600 rpm for 1GC23, and 3000 rpm for 1GC25.*

Shift Position Range	AG tire		Industrial tire		R4 tire	
	kph	mph	kph	mph	kph	mph
Forward						
	0 - 6.90	0 - 4.29	0 - 6.90	0 - 4.29	0 - 6.72	0 - 4.18
	0 - 14.70	0 - 9.13	0 - 14.70	0 - 9.13	0 - 14.70	0 - 8.90
Reverse						
	0 - 5.18	0 - 3.22	0 - 6.90	0 - 4.29	0 - 5.04	0 - 3.13
	0 - 11.03	0 - 6.85	0 - 14.70	0 - 9.13	0 - 10.75	0 - 6.68

3.12.4 Set the cruise control lever

Before starting the procedure

WARNING:
Cruise control should only be used in open spaces, without obstacles, with unobstructed view or traveling on the road. Be thoroughly familiar with cruise control operation before using.

IMPORTANT: *To prevent mechanical failures, do not move the cruise control lever without first pressing the forward hydrostatic pedal.*

NOTE: *Cruise control is not available in the reverse direction.*

Procedure

1. Press the forward hydrostatic pedal (1) until the desired speed is reached.
2. Push the cruise control lever (2) until resistance is felt.
3. Release the forward hydrostatic pedal.

   The tractor will continue to move at the set position.

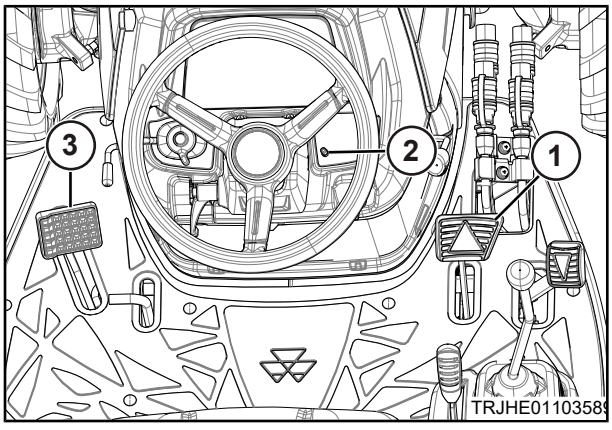


Fig. 33

After finishing the procedure

To release the cruise control, firmly press the brake pedal (3) or lightly press the forward hydrostatic pedal.

3.13 Stop the engine

Procedure

1. Stop the tractor's movement.
2. Press brake pedal and push down on the parking brake lever to lock the brake pedal.
3. Move the range gear shift lever to the neutral position.
4. Reduce the engine speed.
5. Lower attachments to the ground.
6. Lower the 3-point linkage.
7. Let the engine idle for several minutes to let the engine to evenly cool.
8. Turn the main switch to the off position to shut off the engine.
9. Remove the key from the main switch.

After finishing the procedure

CAUTION:
Before you leave the tractor unattended, make sure that the parking brake is engaged, rear mounted implement is lowered to the ground, and key is removed from the main switch.

Always park the tractor on a level area whenever possible. If hillside parking is necessary, put block behind both rear wheels as shown.

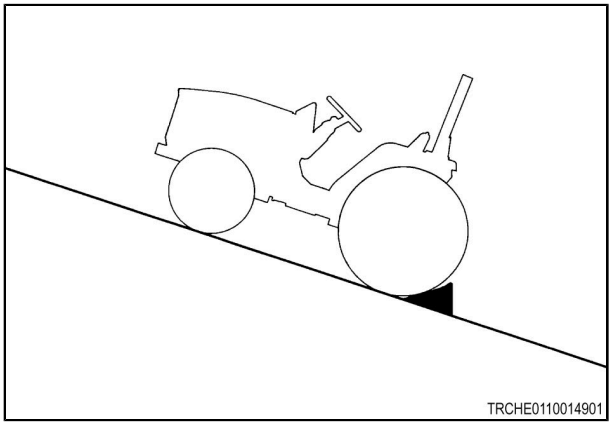


Fig. 34

3.14 Engage the differential lock

CAUTION:
Do not use the differential lock on hard surfaces or when you transport the tractor.

CAUTION:
When the differential lock is engaged, the steering control of tractor will decrease. Disengage the differential lock before you turn.

When the differential lock pedal is pressed, the rear axles are locked together so the rear wheels turn together at the same speed. This is especially important when you operate in loose soil or slippery conditions.

Procedure

1. Stop the tractor.

   CAUTION:

   Do not engage the differential lock while the rear wheels are turning, or damage can result.

2. Press and hold the lock pedal (1).
3. Slowly drive the tractor until the differential lock is engaged.

   You may have to slightly turn the tractor to engage the differential lock.

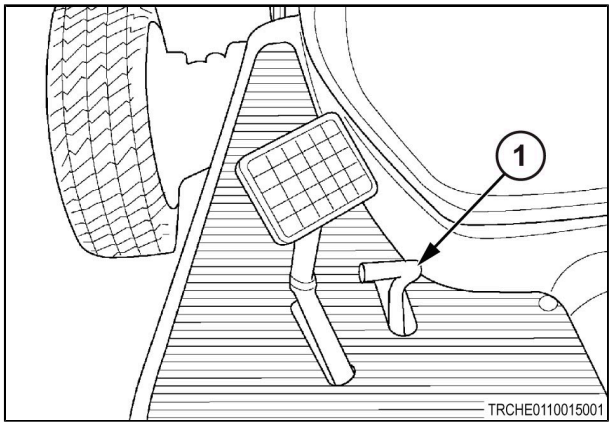


Fig. 35

After finishing the procedure

To disengage the differential lock, release differential lock pedal.

IMPORTANT: *The differential lock pedal will usually return to the off position when disengaged. If the differential lock pedal stays engaged because of a torque difference between the rear wheels, press the hydrostatic pedal slowly to release the differential lock pedal.*

3.15 Four-wheel drive

The four-wheel drive front axle is mechanically driven. The four-wheel drive shift lever (1) engages and disengages the drive for the front axle.

IMPORTANT: *Stop the tractor before you engage or disengage the four-wheel drive.*

- Move the lever down to engage the front axle (four-wheel drive). Power is available to the front and rear axles.
- Move the lever up to disengage the front axle.

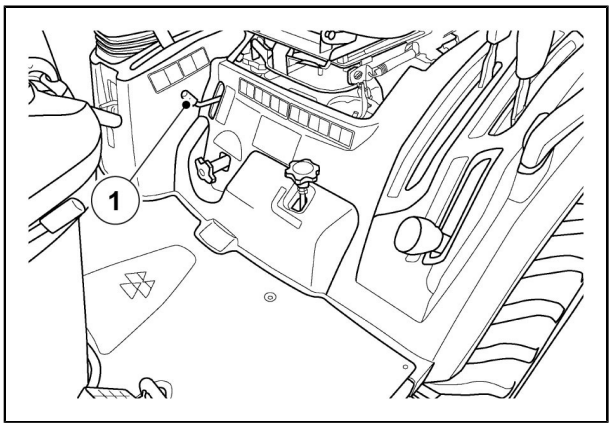


Fig. 36

When the front axle is engaged, the ground speed of the front tires will be faster from the ground speed of the rear tires. This helps to steer the tractor when four-wheel drive is selected.

Disengage the front axle when you road or operate the tractor on a hard, dry surface. Failure to do so will wear the front drive tires and possibly cause driveline damage.

IMPORTANT:

- *Always disengage the front drive axle when you operate the tractor in conditions, with small wheel slippage (dry or hard surfaces).*
- *If a tire replacement is necessary, the same tire dimension must be installed to keep the correct front/rear axle ratio.*

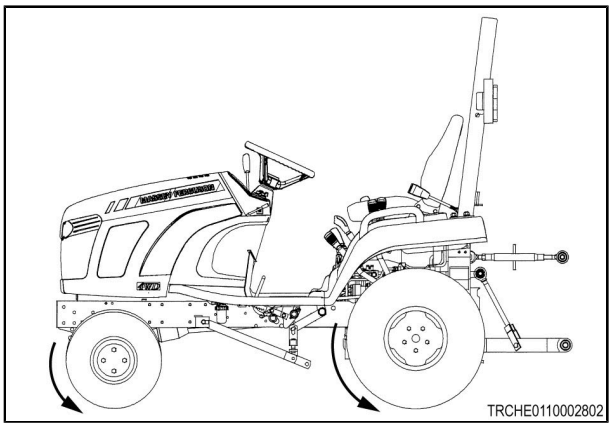


Fig. 37

IMPORTANT: *For safety reasons, when you tow a trailer or you have a heavy attachment, engage the four-wheel drive.*

3.16 Power take-off

WARNING: A potential general safety hazard.

Personal injury, death, or machine damage can occur.

The steps below must be followed.

Power take-off (PTO) shafts and PTO driven implements can be extremely hazardous. When servicing or working near the PTO shafts:

- Always install PTO cap when a PTO drive shaft is not connected. The cap protects bystanders from injury as well as the splines from damage.
- Before connecting, adjusting or working on PTO driven implements, disengage the PTO, stop the engine and remove the key. Do not work under raised equipment.
- Before engaging a PTO-driven implement, always carefully raise and lower the implement using lift control. Check clearances, PTO shaft sliding range and articulation.
- Make sure that all PTO safety shields are in the correct location at all times.
- Make sure all PTO-driven implements are in good condition and to current standards.
- Never step across any driveline.
- Do not use the tractor drawbar or the implement drawbar as a step.
- Never use the driveline as a step.
- Never wear loose fitting clothes.
- Keep at least your height away from a rotating driveline.

3.16.1 Power take-off controls

CAUTION:
Always turn off the PTO and turn off the tractor engine before servicing the PTO driveline or implement. Let all movement stop before you move off the operator's seat.

The rear power take-off (PTO) and mid PTO are controlled by the PTO clutch lever (1).

The rear PTO and mid PTO can be operated at the same time or independent of each other.

To decrease the shock load on the driveline, decrease the engine speed when you engage the PTO clutch.

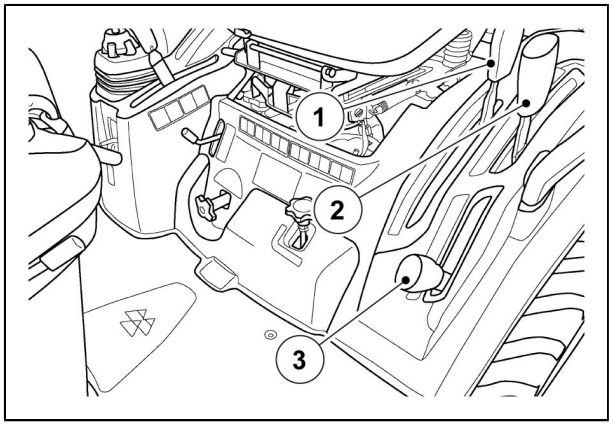


Fig. 38

Rear PTO Operation

WARNING:
Do not move the rear PTO selector lever rearward to the 540 position to engage gear when the PTO clutch lever is in the engagement position.

The rear PTO selector lever (2) is used to select the position of the rear PTO drive gears.

To select the rear PTO, make sure the PTO clutch lever is in the off position. Then move the rear PTO selector lever rearward to the 540 position to engage the gear.

To engage the PTO, move the PTO clutch lever forward.

To disengage the PTO, move the PTO clutch lever rearward.

Mid PTO Operation

WARNING:
Do not move the mid PTO selector lever rearward to the 2000 position to engage gear when the PTO clutch lever is in the engagement position.

The mid PTO selector lever (3) is used to select the position of the mid PTO drive gears.

To select the mid PTO, make sure the PTO clutch lever is in the off position. Then move the mid PTO selector lever rearward to the 2000 position to engage the mid PTO gear.

To engage the mid PTO, move the PTO clutch lever forward.

To disengage the mid PTO, move the PTO clutch lever rearward.

3.16.2 Rear power take-off shaft

CAUTION:
Make sure all PTO shields are installed on tractor and equipment. Before you clean or adjust the tractor or the PTO driven machine, turn off engine and disengage PTO.

A six-spline 35 mm(1-3/8 inch) power take-off (PTO) shaft (1) is located at the rear of the tractor to provide power for mounted and other PTO driven equipment as required.

A protective cover is positioned over the shaft splines when not in use.

A rear PTO shaft speed of 540 rpm is approximately 2532 engine rpm for 1GC23, and 2829 rpm for 1GC25.

The implement driveline (1) is shown connected to the tractor rear PTO shaft.

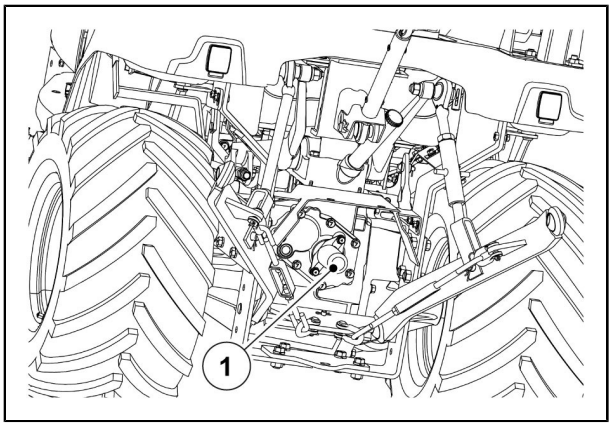


Fig. 39

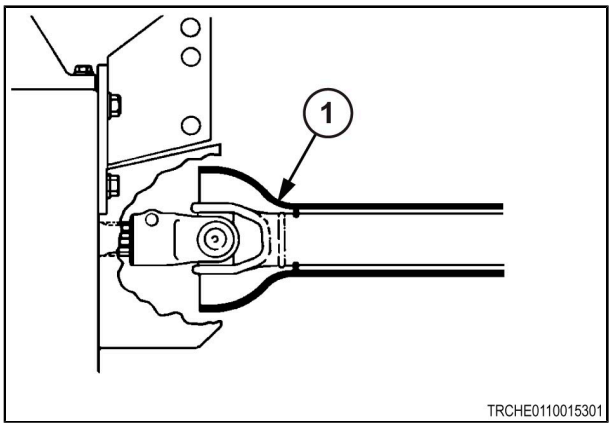


Fig. 40

3.16.3 Mid power take-off shaft

CAUTION:
Make sure all PTO shields are installed on tractor and equipment. Before you clean adjust the tractor or the PTO driven machine, turn off engine and disengage PTO.

The mid power take-off (PTO) (1) is a forward facing shaft positioned at the bottom of the tractor. The mid PTO can be installed to operate mid or front mounted implements. An ASAE S431 25 mm, 15 spline shaft is used.

A mid PTO shaft speed of 2000 rpm is approximately 2476 engine rpm for 1GC23 and 2947 engine rpm for 1GC25.

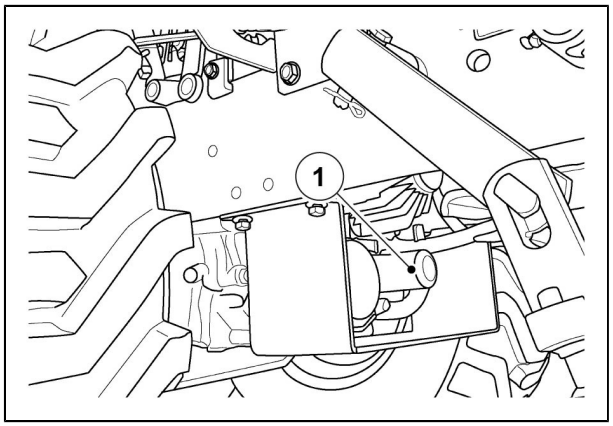


Fig. 41

3.17 3-point linkage

WARNING: Component failure hazard.

Personal injury or machine damage can occur.

When using mounted implements with the PTO driveline, make sure:

PTO drive shaft has minimum 51 mm (2 in) engagement of telescoping sections, at all hitch/implement positions.

Hitch height during raising does not bind drive shaft universal joints due to extreme drive shaft angles. Limiting raising height can be required.

PTO drive is disengaged during transport.

3-point linkage connects the tractor and implement into one working unit. Implement position and raising are controlled hydraulically. In addition, implement weight and loads put downward pressure on the tractor rear wheels to increase traction.

IMPORTANT: *Do not use 3-point linkage mounted backhoes. Only use backhoes with a full subframe mount. The use of a 3-point backhoe will void warranty.*

3.17.1 3-point linkage controls

Lift control

CAUTION:
When you work on or around mounted implements, always lower to ground prior to work. If implement must be raised, always block the implement and the lower lift links securely.

CAUTION:
Always use lift control to attach or detach implements to provide precise control of hitch.

Use the lift control when fastening or removing implements and other operations requiring the implement to be kept at a constant height above the ground. Lift control is also used with implements equipped with gauge wheels.

The lift control lever (1) lifts and lowers the 3-point hitch.

- Move the lift control lever rearward to raise the 3-point hitch.
- Move the lift control lever forward to lower the 3-point hitch.

To begin work, align the tractor and implement in the field. Move the lift control lever forward to lower the implement to the work height.

To turn the tractor, move the lift control lever rearward to raise the implement. Complete the turn and lower the implement back to the work height.

To finish work and transport, fully raise the 3-point hitch and turn the speed of lower control knob fully clockwise to lock the 3-point hitch.

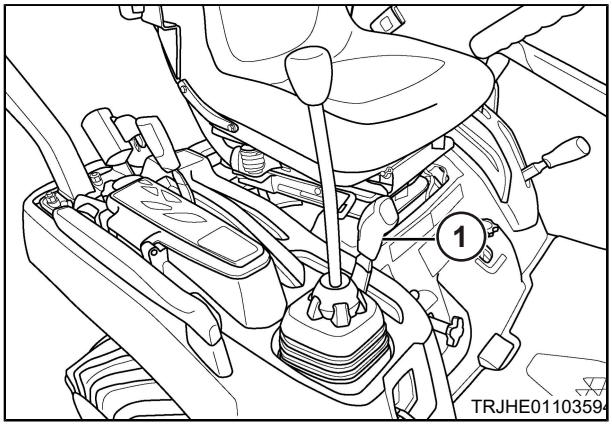


Fig. 42

Speed of lower control

The lowering rate knob (1) adjusts the speed of drop of the 3-point linkage and implement.

- Turn clockwise to slow the drop speed
- Turn counterclockwise to increase the drop speed

Turn the lowering rate knob fully clockwise to lock the implement (or hitch) in the raised position for transport.

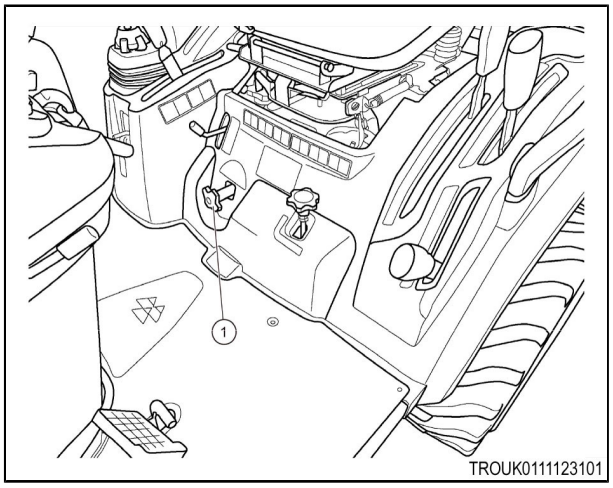


Fig. 43

Cut height control

Cut height position	Cut height
Lowest	20 mm to 25 mm (0.78 in to 1 in)
1	30 mm to 35 mm (1.2 in to 1.3 in)
2	35 mm to 40 mm (1.3 in to 1.5 in)
3	40 mm to 50 mm (1.5 in to 1.9 in)
4	60 mm to 70 mm (2.3 in to 2.7 in)
5	70 mm to 80 mm (2.7 in to 3.1 in)
Highest lock	100 mm to 125 mm (3.9 in to 4.9 in)

The cut height control knob (1) adjusts the cut height for the mid-mounted mower deck.

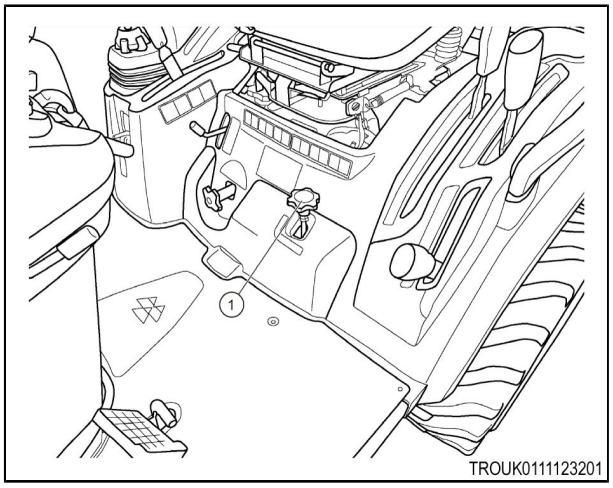


Fig. 44

Use the 3-point control lever to raise the mower deck to the highest cut height position before you turn the cut height control knob. The knob cannot be turned when the mower deck is in the lowered position.

CAUTION:
When you operate the tractor without the mid-mounted mower deck, turn the cut height control knob clockwise to the highest position.

- Turn clockwise to raise the cut height of the mower deck.
- Turn counterclockwise to lower the cut height of the mower deck.

3.17.2 Linkage assembly

(1) The lower links are the primary fastening points to the lower implement pins
(2) The lift rods connect the lower links to the hydraulic lift arms. You can adjust the right lift rod to level the implement (side to side)
(3) The stabilizer reduces the side sway of the implement
(4) The top link is an adjustable, turnbuckle type to level the implement (front to rear)

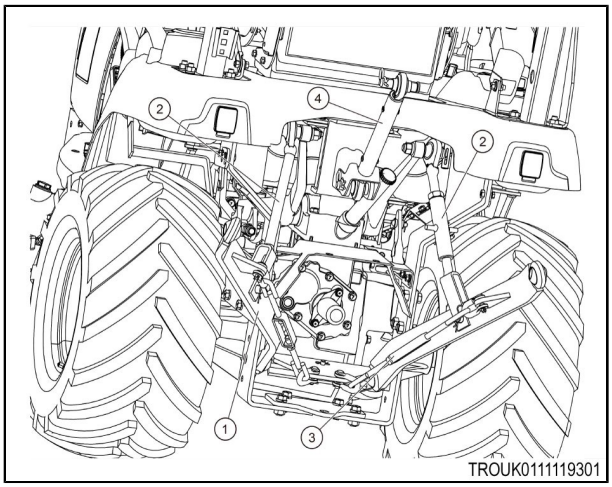


Fig. 45

3.17.3 Connect implements

Procedure

1. Back the tractor to the implement. Align the tractor with the implement hitch frame.
2. Use the lift control lever (1) to raise or lower the hitch. Align the left-hand lower link end with the implement fastening pin.
3. Lock the brakes, stop the engine and take the key with you.

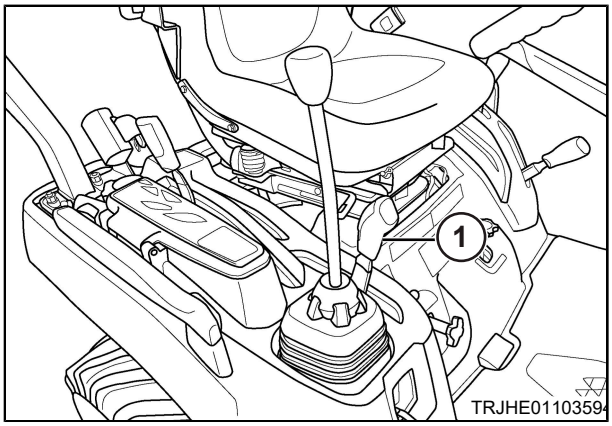


Fig. 46

4. Move the ball end of the left lower link (1) over the implement pin and secure with a retainer pin.
5. Adjust the height of the right lower link with the turnbuckle (2).
6. Connect the right lower link (3) to the implement with a retainer pin.
7. Attach the top link (4) to the top of the implement hitch frame.
8. Turn the center barrel section of the top link to level the implement from front to rear.
9. Use the turnbuckle and top link to adjust for level operation.
10. Make sure all adjustments are secure.

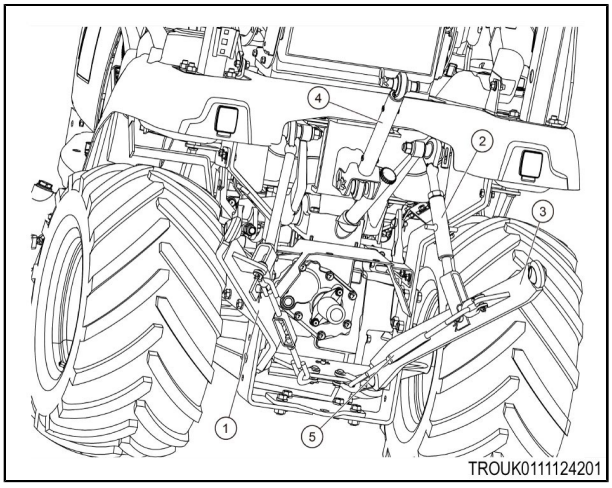


Fig. 47

11. Adjust the stabilizer (5) evenly on each lower link to reduce side play to the desired level.

CAUTION:

The amount of side play (stabilizer looseness) varies with the implement and the type of operation. A total side movement of 50 mm (2 in) is correct.

Do not remove all side play.

3.17.4 Disconnect implements

WARNING: Crushing hazard.

Personal injury or machine damage can occur.

Always use lift control to connect or disconnect implements to give precise control of hitch.

Procedure

1. Select a solid, level surface to disconnect and store the implement.
2. Lower the implement to the ground by moving the lift control lever to the down position.
3. If necessary, adjust the turnbuckle on the right-hand lift link to level the implement on the ground.
4. Lock the brakes, stop the engine, and take the key with you.
5. For a PTO driven implement, disconnect the implement PTO drive shaft.
6. Remove the top link from the implement.

   NOTE: *Lengthening or shortening the top link can be necessary to disconnect the implement.*
7. Put the top link in the storage position on the tractor by engaging the spring on the top link in the slot in the rear center panel.
8. Disconnect the lower links from the implement pins.
9. Adjust the stabilizers (1) to prevent tire interference.
10. Sit in the operator seat and start the engine. Release the brake and drive the tractor clear of the implement.

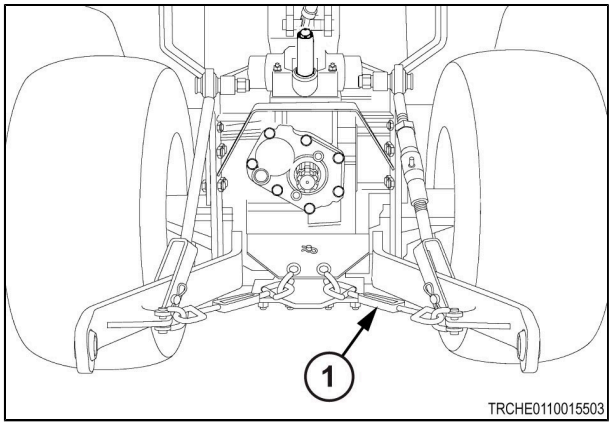


Fig. 48

3.18 Joystick

3.18.1 Joystick control lever

WARNING:
Only operate the joystick when seated on the tractor.

The joystick control lever (1) is located to the right side of the seat.

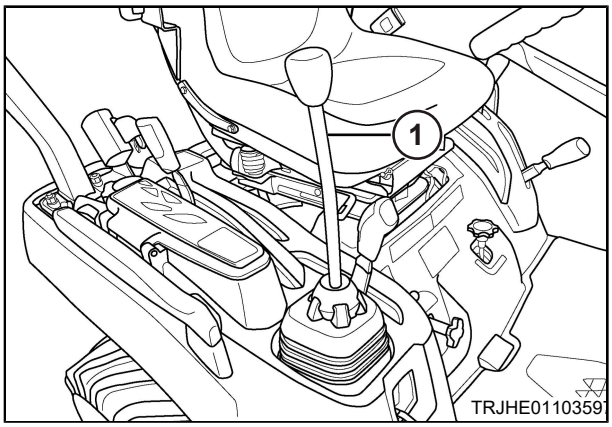


Fig. 49

The joystick control lever has seven positions:

- 1. Neutral
- 2. Boom lift
- 3. Boom lower
- 4. Boom float
- 5. Bucket curl back
- 6. Bucket dump
- 7. Bucket fast dump

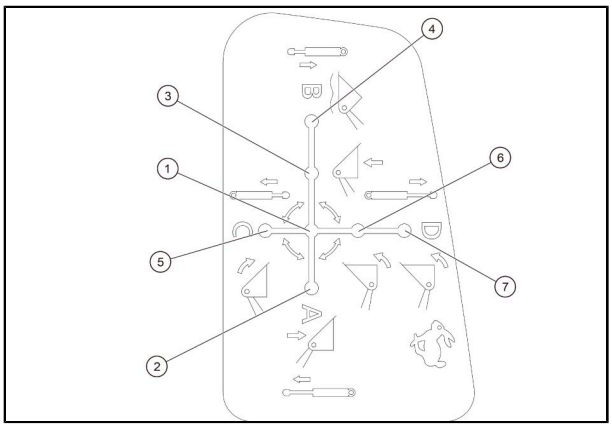


Fig. 50

The boom lift, boom lower, and bucket positions are spring loaded to neutral.

The boom float has a detent to keep the control valve in the float position.

WARNING:
Make sure to fully lower the boom before you put the joystick control lever into boom float.

3.18.2 Joystick operation

Move the joystick control lever to operate the auxiliary valve. The auxiliary valve supplies oil to the hydraulic ports (1).

Move the joystick control lever rearward and forward to move the A/B spool in the control valve.

Move the joystick control lever side-to-side to move the C/D valve spool and control the loader bucket position. When used with a blade, this controls angling (left and right).

All positions, except float, will return to the neutral position when lever is released.

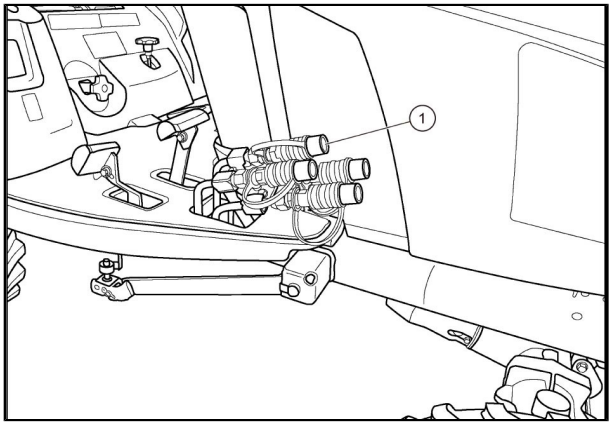


Fig. 51

(1) Move rearward to lift the loader boom or other attachment.
(2) Move forward to lower the loader boom or other attachment.
(3) Push completely forward to put into the float position. This will let attachment follow ground contours
NOTE: *When in float, the detent holds the A/B valve spool. Pull the lever rearward to disengage the detents.*
(4) Move left to curl back the bucket.
(5) Move right to dump the bucket.
(6) Push completely to the right to put the valve in the regenerative position. This lets the bucket to dump quickly.

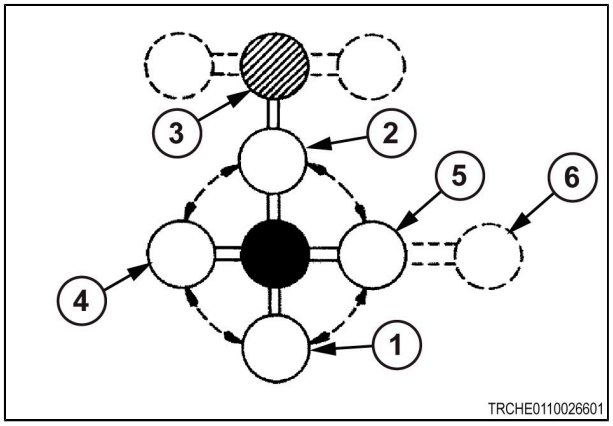


Fig. 52

WARNING:
Make sure to fully lower the boom before you put the joystick control lever into boom float.

3.18.3 Joystick lockout

The joystick control lever has a lockout (1) that will keep the joystick in the neutral position.

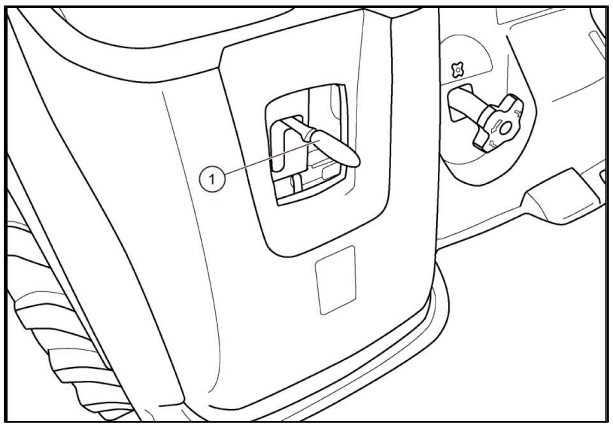


Fig. 53

To use the joystick control lever lockout:

- To lock the joystick, move the lockout lever up and to the left.
- To unlock the joystick, move the lockout lever to the right and down.

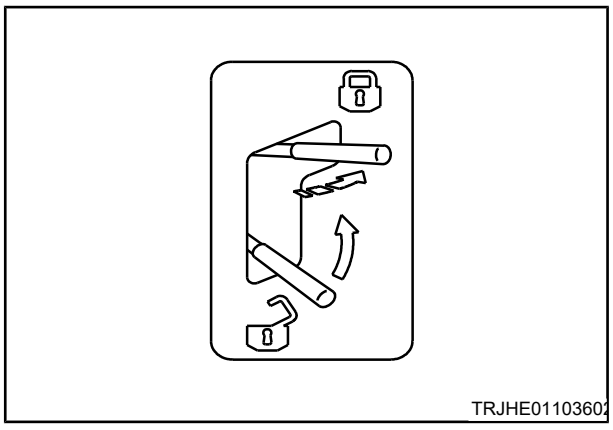


Fig. 54

3.18.4 Hydraulic ports

The hydraulic ports are located above the right step.

Loader ports	
Output port	Function
(A)	Loader boom lift
(B)	Loader boom lower and loader boom float
(C)	Bucket curl back
(D)	Bucket dump and bucket fast dump

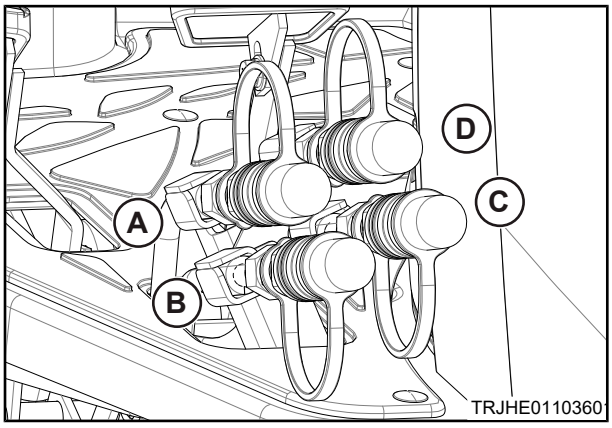


Fig. 55

Ports for other hydraulic operations			
Output port	Double acting cylinder	Single acting cylinder	Cap color
(A)	Extend	Extend or retract	Red
(B)	Retract	Not used	Black
(C)	Extend	Not used	Green
(D)	Retract	Not used	Blue

3.19 Roll-over protective structure

WARNING:
If the roll-over protective structure (ROPS) gets damaged, do not weld, drill, bend or straighten. See your dealer to order and install a replacement. Make sure all components are in correct working order to provide the intended protection.

Use only original bolts, or equivalent replacements, must be used and tightened to correct torque value. Make sure both hinge joints are properly secured.

Tractor with ROPS

Tractors are equipped with a roll over protective structure (ROPS) (1) and a seat belt.

The seat belt must be worn at all times, when you are seated on the tractor.

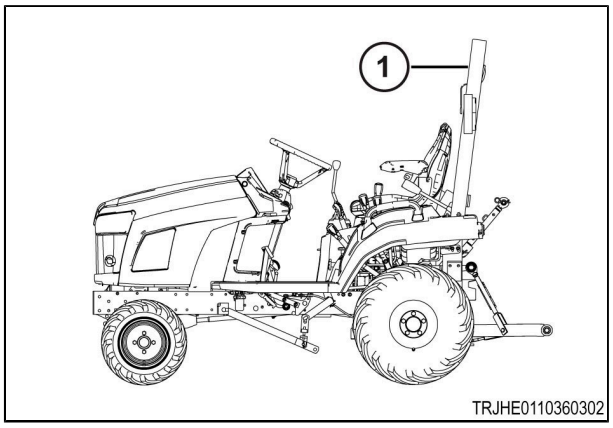


Fig. 56

Tractors with foldable ROPS

Tractors are equipped with a roll over protective structure (ROPS) (1) that folds and a seat belt.

The seat belt must be worn at all times, when you are seated on the tractor with the ROPS in the upright, locked position.

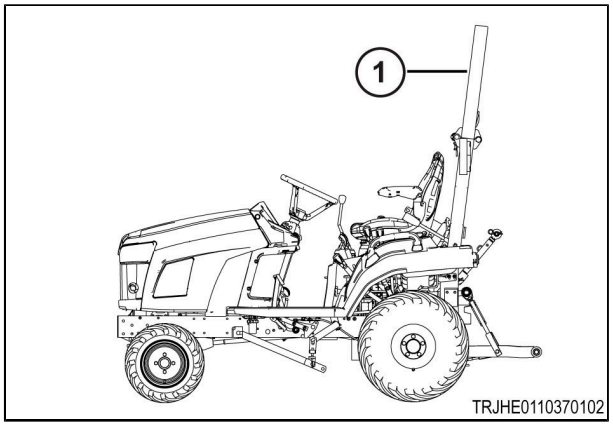


Fig. 57

WARNING:
No roll-over protection is provided when the ROPS is folded down. Drive with extreme care. Tractor roll over may result in serious injury or death.

When overhead clearance is restricted, fold down the upper portion of the ROPS. Remove the retainer pin and lower the upper part of the ROPS.

Do not wear the seat belt when the ROPS is folded down.

3.20 Transport on a trailer

IMPORTANT: *The platform frame can be damaged if the tractor is secured with fasteners across the platform frame.*

Tightening fasteners over the platform deck or to the roll over protective structure (ROPS) can result in damage.

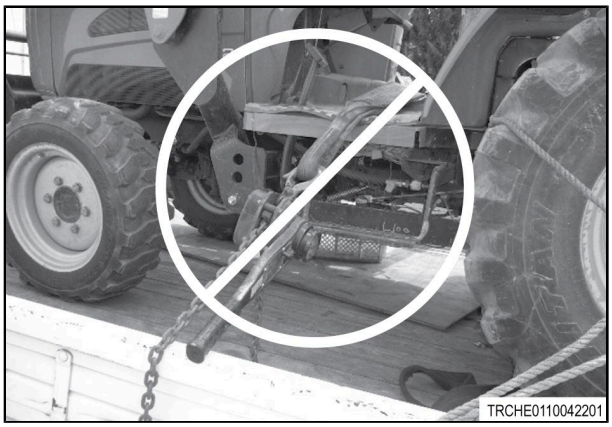


Fig. 58

3.21 Auxiliary hydraulic system

The auxiliary hydraulics operate implements requiring an external hydraulic supply for operation.

The control lever (1) controls implement raising, lowering, or other hydraulic function.

Pull the lever upward or push it down to switch the state of the valve.

The control lever is spring loaded to the center (neutral) position.

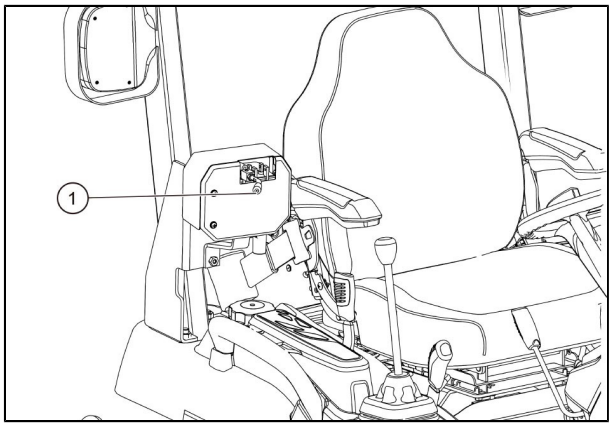


Fig. 59

4 Maintenance

4.1 Lubrication and maintenance 95
4.1.1 Lubrication and maintenance chart for daily inspection 95
4.1.2 Lubrication and maintenance chart 95
4.1.3 Lubrication fill and drain locations 97
4.1.4 Lubrication fittings 97
4.2 Engine oil and filter 98
4.2.1 Examine the engine oil 98
4.2.2 Change the engine oil 99
4.2.3 Replace the engine oil filter 100
4.3 Transmission oil 101
4.3.1 Examine the transmission oil level 101
4.3.2 Change the transmission oil and filter 101
4.4 Front axle oil 103
4.4.1 Examine the front axle oil level 103
4.4.2 Change the front axle oil 103
4.5 Engine coolant 104
4.5.1 Coolant 104
4.5.2 Coolant level 104
4.5.3 Replace the engine coolant 104
4.6 Engine belt 106
4.6.1 Adjust the engine belt 106
4.7 Engine air filter 108
4.7.1 Clean the engine air filter 108
4.8 Fuel system 110
4.8.1 Fuel filter 110
4.8.2 Replace the fuel filter 110
4.8.3 Remove air from the fuel system 111
4.8.4 Fuel tank filler cap 111
4.8.5 Fuel system components 112
4.8.6 Hand throttle lever 112
4.9 Electrical system 113
4.9.1 Battery 113
4.9.2 Replace the battery 114
4.9.3 Start the engine with a booster battery 115
4.9.4 Fuses 115
4.9.4.1 Fuses locations 116
4.9.5 Neutral start switches 117
4.9.6 Spare power supply 118
4.10 Adjust the brakes 119
4.11 Hydrostatic adjustments 120
4.12 Steering system 121
4.12.1 Steering free play 121

4.12.2 Adjust the front wheel alignment 121
4.13 Wheels 123
4.13.1 Wheels and tires 123
4.13.2 Wheel bolt torque 123
4.13.3 Wheel bolt torque chart 123
4.14 Prepare tractor for storage 124
4.15 Power washing 125

4.1 Lubrication and maintenance

4.1.1 Lubrication and maintenance chart for daily inspection

Daily	
x	Examine and repair all the controls and switches.
x	Examine and tighten all the fasteners and hardware.
x	Examine and repair the hoses, belts and wiring.
x	Examine and fill the engine oil level.
x	Examine and fill the transmission oil level.
x	Clean debris from the air screens and radiator.
x	Examine and fill the radiator coolant level.
x	Examine and adjust belt tension.
x	Examine and fill the fuel tank level.
x	Examine and clean the fuel filter sediment bowl.
x	Examine and repair the lamps and flashers.
x	Examine and adjust the brake.
x	Examine, adjust, or replace the tire condition and pressure.
x	Examine and tighten the wheel bolt torque.
x	Examine and adjust the steering free play.

4.1.2 Lubrication and maintenance chart

First 50 hours	Every 250 hours	Every 500 hours	Other	
x				Examine and adjust the toe in.
x				Examine, adjust and tighten the tie rod ends.
x			Yearly	Examine the power steering hoses.
x			Yearly	Examine the fuel hoses.
x				Examine the electrical wiring.
x				Examine and tighten the hardware on the outside of the engine.
			Every 50 hours	Brake pivots (apply grease to fitting)
			Every 50 hours	3-point turnbuckle (apply grease to fitting)
			Every 50 hours	Hydrostatic pedals (apply grease to fitting)
			Every 50 hours	Mower linkage pivots (apply grease to fitting) if equipped
x	x		First 50 hours then yearly or every 250 hours	Replace the engine oil and engine oil filter.

First 50 hours	Every 250 hours	Every 500 hours	Other	
	x		Yearly or every 250 hours	Replace the transmission oil and oil filter.
	x			Examine the radiator fins
	x			Examine and adjust the front wheel alignment.
	x		Yearly or every 250 hours	Examine and fill the front axle oil level.
		x	Every two years or 500 hours	Replace the front axle oil.
		x		Inspect the engine valve clearance.
		x	Every two years or 500 hours	Change the fuel filter element.
			When the transmission oil and oil filter are replaced	Check and clean suction filter. Replace it, if it is damaged.
x		x	First 50 hours then every 500 hours	Examine and adjust the belt and belt tension.
			1000 hours	Examine the starter.
			1000 hours	Examine the alternator.
			1000 hours	Examine and tighten the hardware on the outside of the engine.
			Every two years or 1000 hours	Change the engine coolant.
			As necessary	Bleed the air from the fuel system
			As necessary	If the engine has not been started for 12 months or longer, replace the engine oil and filter.
			As necessary	Examine, clean, or replace the air cleaner element.
			As necessary	Examine the condition of the battery.
			As necessary	Fill and bleed the air from the coolant system.

4.1.3 Lubrication fill and drain locations

- ● Grease fittings
- ◎ Fill location
- ⊕ Drain location
- ▲ Oil check window
- ⊗ Coolant fill location
- △ Coolant drain location
- ■ Oil check dipstick

Item	Component	Description
1	Engine crankcase	Engine oil
2	Engine radiator	Coolant
3	Overflow tank	Coolant
4	Fuel tank	Diesel fuel - Ultra Low Sulfur diesel fuel only
5	Rear housing	Hydraulic oil
6	Four-wheel drive axle	Hydraulic oil
7	Brake pivots	Grease
8	3-point turnbuckle	Grease
9	Hydrostatic pedals	Grease
10	Mower linkage	Grease
11	3-point top link	Grease

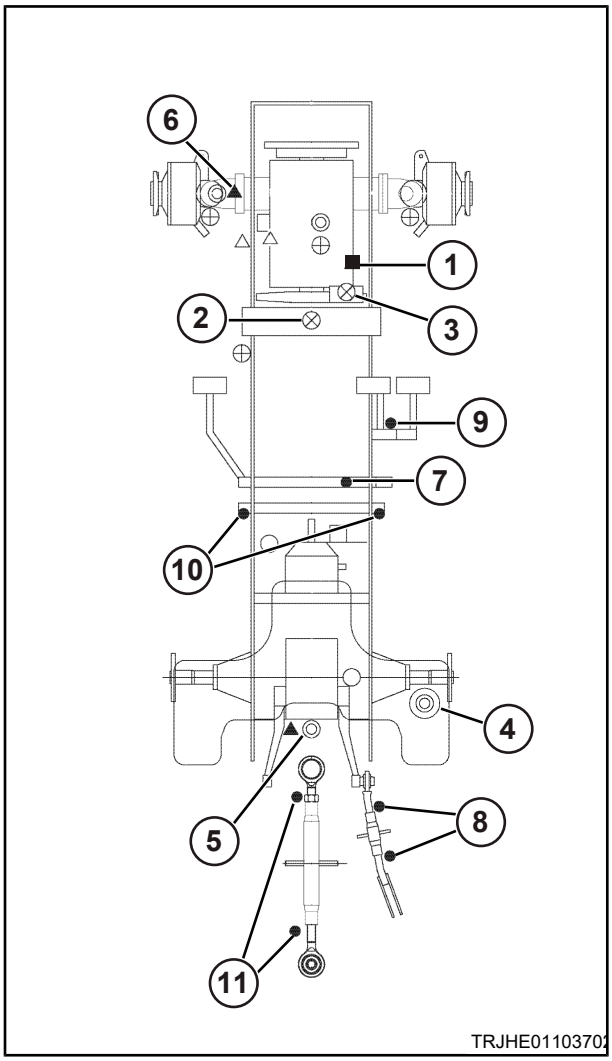


Fig. 1

4.1.4 Lubrication fittings

Clean the grease gun and the lubrication fittings before and after lubricating to prevent contamination from dirt.

NOTE: *When operating in muddy or extremely wet conditions, lubricate the fittings daily.*

4.2 Engine oil and filter

4.2.1 Examine the engine oil

Procedure

1. Park the machine on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
2. Wait a short time to let the oil stabilize in the crankcase.
3. Open the engine cover.
4. Pull out the dipstick (1) from the level gauge guide pipe.

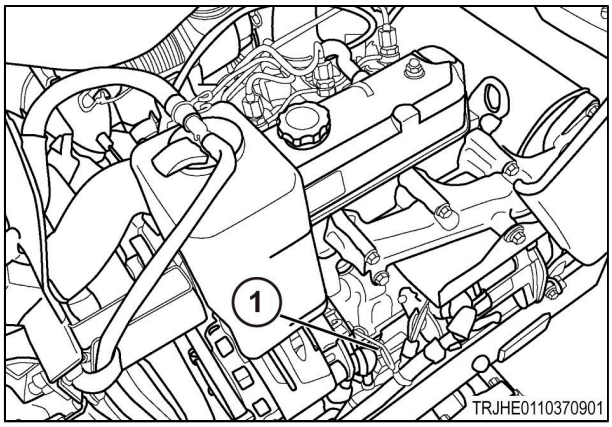


Fig. 2

5. Make sure the oil level is between the full (1) and the lower limit (2) on the dipstick.

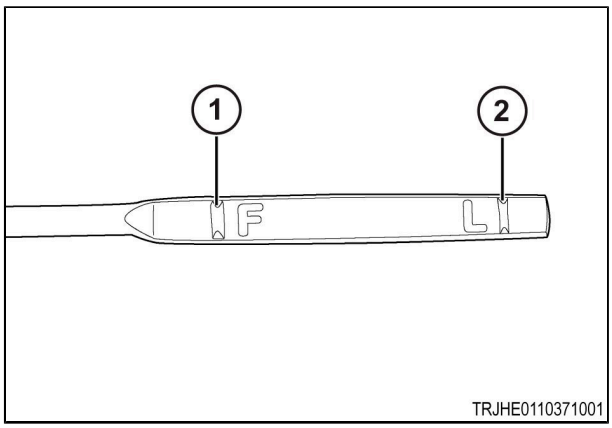


Fig. 3

6. Wipe off the dipstick (1), momentarily install in the engine, and examine the oil level again.
7. Add oil through filler opening (2) as required.

   NOTE: *Add oil slowly to let the air leave the crankcase.*

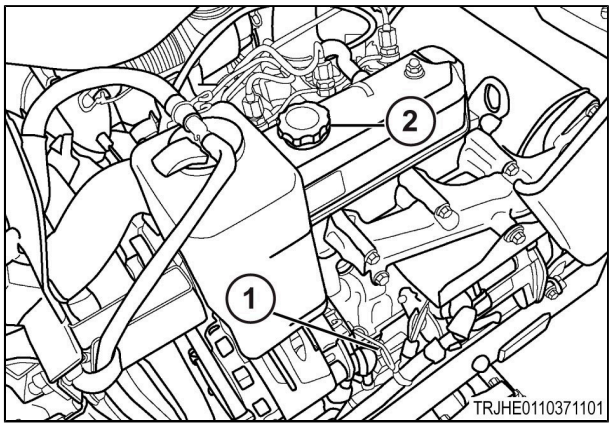


Fig. 4

4.2.2 Change the engine oil

WARNING: Fire hazard. Fuel safety.

Personal injury or machine damage can occur.

Clean up any spilled oil immediately.

IMPORTANT: *Do not leave a combustible material such as cloth and work gloves on and around the engine. Spilled fuel can cause a fire.*

IMPORTANT: *Be careful not to let dust to enter through the oil filler when adding oil. Foreign material, like dust, entering the system can cause engine damage.*

IMPORTANT: *The oil level above the full mark on the dipstick can cause engine problems. Be sure to examine the oil level with the oil level gauge.*

IMPORTANT: *Do not dump used oil. It is against by law. For discarding of used oil, see with your local dealer. Change engine oil and the oil filter at the same time. Engine oil analysis is recommended when changing engine oil.*

IMPORTANT: *Do not reuse oil filter elements.*

Procedure

1. Operate the machine until the engine is warm (temperature gauge must show above the cold mark).
2. Park the machine on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
3. Put a catch pan in position.
4. Remove the drain plug (1) from the oil pan.

CAUTION: Hot components can burn.

Personal injury can occur.

Use suitable personal protective equipment.

5. Install the drain plugs. Tighten to 40 Nm to 50 Nm (29.5 lbf ft to 36.9 lbf ft).
6. Fill the engine crankcase through the filler opening (2) to the full mark on the dipstick.

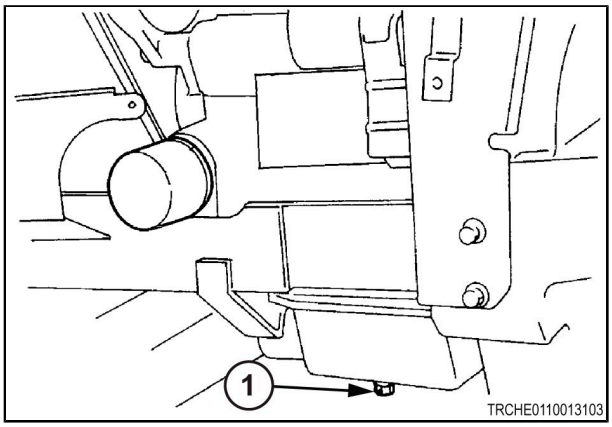


Fig. 5

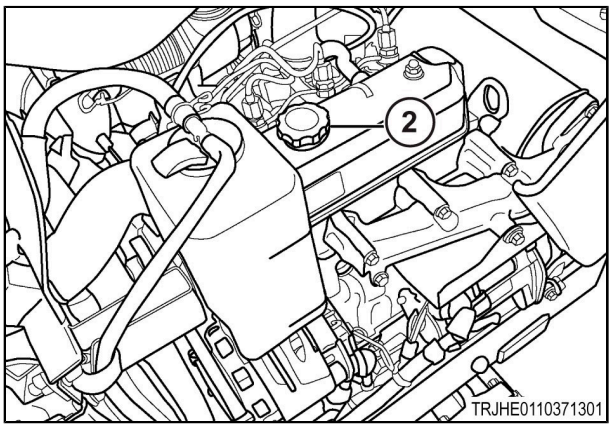


Fig. 6

4.2.3 Replace the engine oil filter

Procedure

1. Remove the engine oil filter (1) from the engine and discard.
2. Make sure the original filter gasket has been removed.
3. Lubricate the new gasket on the replacement element with clean engine oil.
4. Install a new oil filter until the gasket contacts the adapter.
5. Tighten the oil filter 2/3 turn.
6. Add engine oil to the engine.
7. Clean any spilled oil.
8. Start the engine and examine for leaks.
9. Examine the engine oil level and add oil as required.

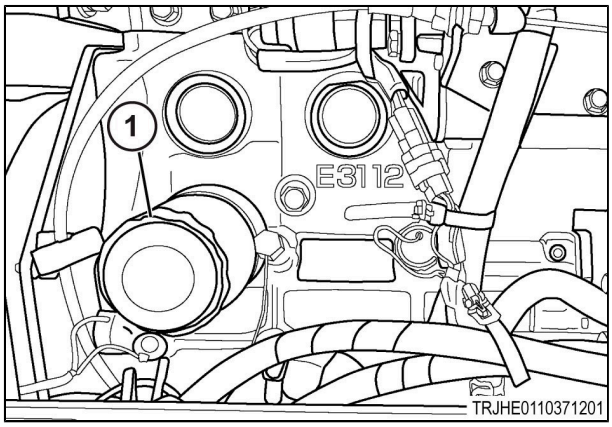


Fig. 7

4.3 Transmission oil

The transmission oil lubricates the transmission, center housing, and rear axles, and is used as hydraulic fluid.

NOTE: *Adding oil to the transmission will also keep the oil level correct in the center housing and rear axles.*

4.3.1 Examine the transmission oil level

Procedure

1. Lower the 3-point linkage and all external hydraulically controlled equipment.
2. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Examine the oil level in the oil level window (1).

   Result

   The oil level must be seen in the middle of the oil level window.
4. If necessary, add oil.
   a) Remove the filler plug (2).
   b) Add oil through the filler opening.
   c) Install the filler plug.

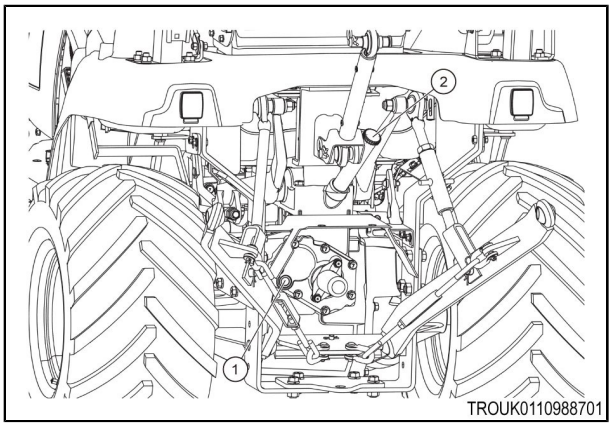


Fig. 8

4.3.2 Change the transmission oil and filter

Procedure

1. Lower the 3-point linkage completely.
2. Park the tractor on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
3. Place a suitable catch pan in position.
4. Remove the drain plug (1) and let all oil drain from the system.
5. If equipped, remove the filter guard.

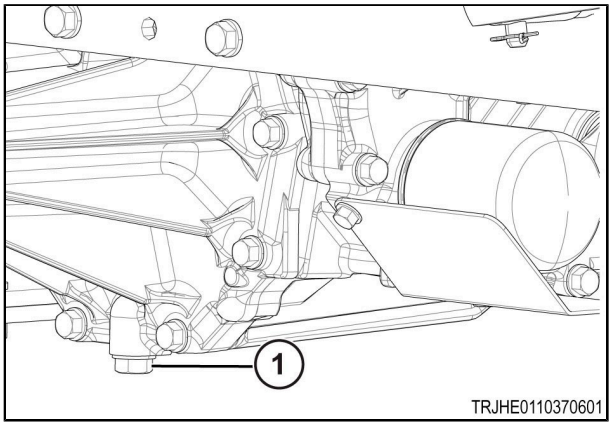


Fig. 9

6. Remove the transmission oil filter (1) from the adapter. Use a filter wrench, if required.
7. Make sure the original filter gasket has been completely removed.
8. Clean the filter adapter.
9. Lubricate the gasket on the new filter with clean hydraulic oil.
10. Install the new filter until the gasket contacts with the adapter and tighten additional 2/3 turn by hand. Do not use a filter wrench to install the filter.
11. If removed, install the filter guard.
12. Use a jack to lift the left tire off the ground.
13. Use a stand to support the left side of the tractor.
14. Remove the left rear wheel.
15. Remove the transmission suction filter (1).
16. Clean the transmission suction filter screen in solvent or kerosene.
17. Dry the transmission suction filter completely.

    NOTE: *Replace the suction filter when it is damaged.*
18. Install the transmission suction filter. Make sure the O-rings (2) are not damaged.
19. Apply sealant to the threads on drain plug(s) and install.
20. Fill the system with new transmission oil.
21. Start the tractor and let idle several minutes while you operate the hydraulic controls.
22. Stop the engine and lower the 3-point linkage.
23. Examine the oil level. Add transmission oil as necessary.
24. Examine for leaks and repair as necessary.

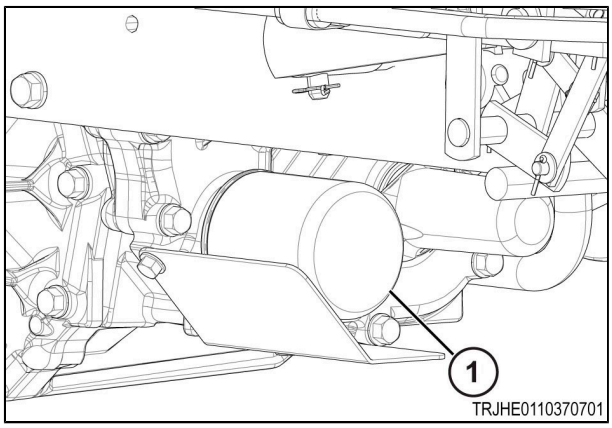


Fig. 10

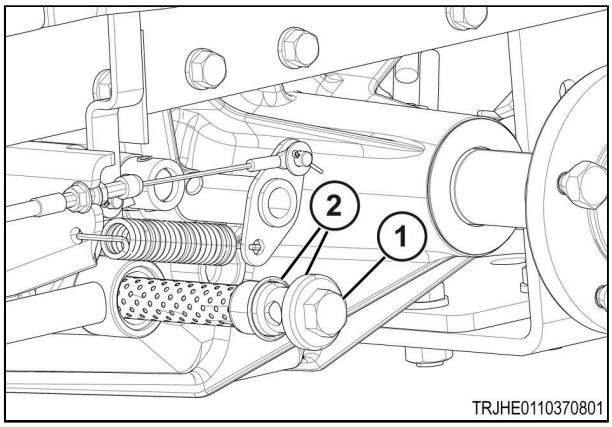


Fig. 11

4.4 Front axle oil

The front dive axle has a common oil level for the front differential housing and each wheel reduction unit.

4.4.1 Examine the front axle oil level

Procedure

1. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
2. Remove the oil fill plug (1) on the top of the left-hand front axle.
3. Remove the plugs (2) on the top of the final case on both sides of the axle.
4. Examine the oil level.

   Make sure that the oil level is at the mid point of the axle shaft inside the front axle housing. If the oil level is low, add oil to the front axle through the fill plug.
5. Install the plugs (1) and (2) on the top of the final case on both sides of the axle.

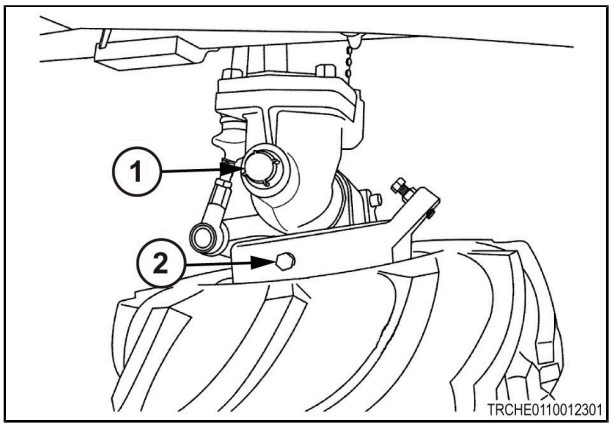


Fig. 12

4.4.2 Change the front axle oil

Procedure

1. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
2. Put suitable catch pans under the drain plugs (1).
3. Remove the drain plugs (1) and drain the oil out of the final case on the front axle.
4. Wrap the threads of the drain plugs (1) with sealing tape.
5. When the oil has drained completely, install the drain plugs (1) securely.
6. Remove the plugs (2) on the top of the final case on both sides of the axle to let air out of the front axle.
7. Fill with oil through the oil fill hole (3).
8. Wait 5 minutes to let air to escape from the front axle.
9. Examine the oil level.
10. Install the plugs on the top of the final case on both sides of the axle.

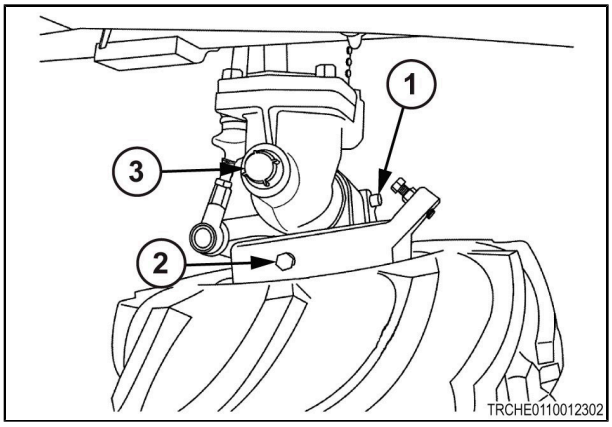


Fig. 13

4.5 Engine coolant

4.5.1 Coolant

The engine coolant mixture must be 40 to 60 percent ethylene or propylene-glycol based antifreeze and water. The best mixture is 50 percent antifreeze and 50 percent water.

Do not use water only as coolant.

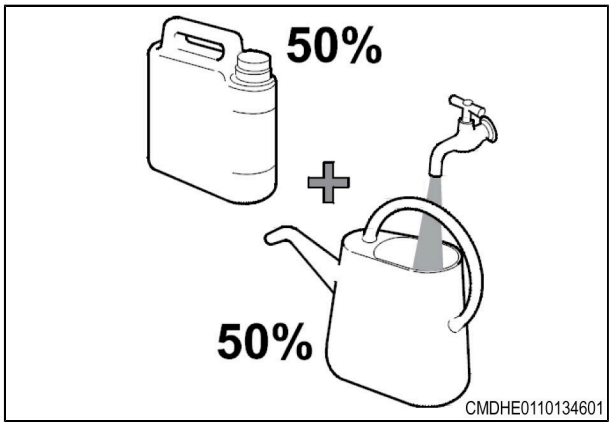


Fig. 14

4.5.2 Coolant level

CAUTION:
DO NOT remove radiator cap if engine is hot. If the cap is removed while engine is hot, steam and hot coolant will be discharged, resulting in burns or other injury. Allow engine to cool until cap can be comfortably touched with bare hand. Then, loosen cap to first notch to allow pressure to escape, then remove cap.

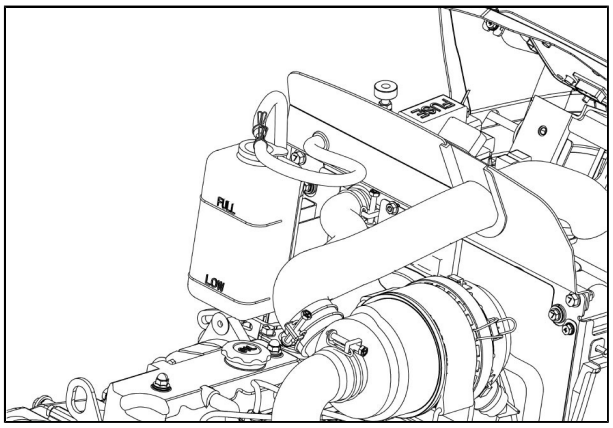


Fig. 15

The radiator is equipped with an overflow tank to keep the coolant in the radiator at the correct level. Examine the coolant level in the overflow tank during the daily inspection.

Open the engine cover. Make sure the coolant level in the overflow tank is between FULL and LOW.

If the coolant is below the LOW level, add coolant to the overflow tank so the level is between FULL and LOW.

IMPORTANT: *Do not fill the overflow tank above the FULL level. Overfilling will prevent the radiator from correctly operating and can cause a coolant leak.*

Periodically check the condition of the hoses, belt, and clamps. Tighten or replace as necessary.

Keep the radiator, radiator screen, and engine cover screens clean for maximum cooling.

IMPORTANT: *Be careful when you clean the radiator, not to damage the radiator fins.*

4.5.3 Replace the engine coolant

Procedure

1. Park the tractor on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
2. Make sure the engine is cool.
3. Put a catch pan in position.

4. Remove the drain hose (1) on the left side.
5. Remove the drain plug (2) on the left side.
6. Remove the radiator cap. Let the coolant drain completely.
7. Remove the overflow tank.
8. Flush the inside of the radiator and the overflow tank with water.
9. Install the overflow tank.
10. Install the drain plug and the drain hose.
11. Fill the cooling system with coolant.
12. Install the cap on the overflow tank.
13. Install the radiator cap.
14. Operate the engine for five minutes at approximately 1500 rpm.
15. Stop the engine and take the key with you.
16. Examine the coolant level and add coolant as necessary. The coolant level must be between LOW and FULL.

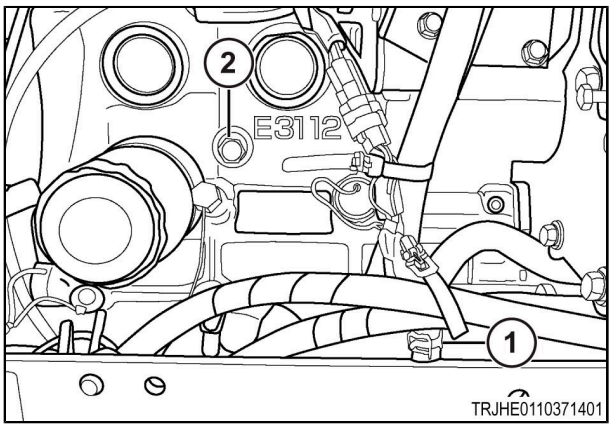


Fig. 16

4.6 Engine belt

WARNING: Hot components can burn.
Severe personal injury can result.
Let the engine and components cool before doing maintenance.

IMPORTANT: *If too much tension is applied to the belt, the bearings in the fan will be damaged.*

Examine the belt for damage for cracks, peeling, and wear. Replace the belt if you see damage.

The correct engine belt tension helps to make sure there is correct coolant flow through the cylinder block and the radiator.

The tension on the engine belt must be 13 mm (1/2 in) deflection at 2.3 kg (5.0 lb) of force.

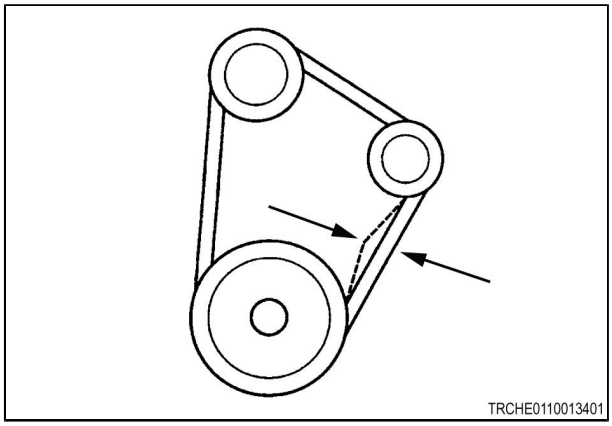


Fig. 17

4.6.1 Adjust the engine belt

The tension on the engine belt must be 13 mm (1/2 in) deflection at 2.3 kg (5.0 lb) of force.

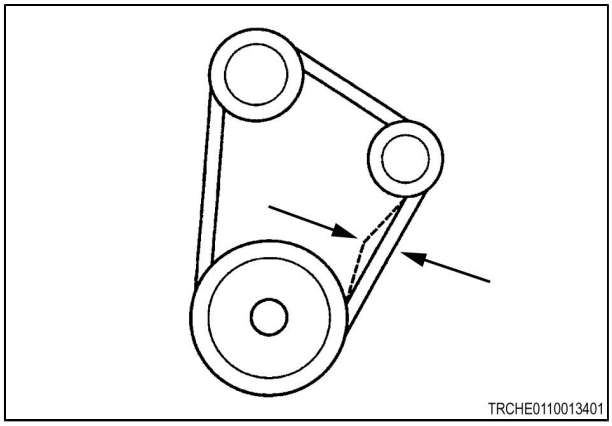


Fig. 18

Procedure

1. Loosen the alternator pivot bolt (1).
2. Loosen the tensioner bracket bolt (2).
3. Pull outward on the top of the alternator to get the correct tension on the belt.
4. Tighten the tensioner bracket bolt.
5. Tighten the alternator pivot bolt.

   IMPORTANT: *Do not pry against the alternator housing or pulley. Carefully pry against the alternator mounting flange to prevent damage.*

   IMPORTANT: *If too much tension is applied to the belt drive, the bearing in the alternator will be damaged.*

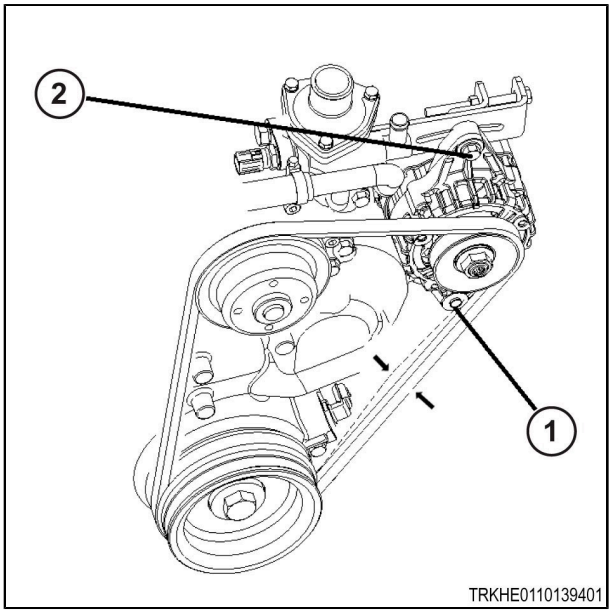


Fig. 19

4.7 Engine air filter

IMPORTANT: *Never operate the engine with the air filters removed.*

Open cover to access the air filter (1) and the dust ejector (2).

The dust ejector traps dust deposits that fall from the outer element.

Weekly or as necessary, remove dust from the ejector. To remove the dust, squeeze the dust ejector. If the dust is damp, clean the ejector with a cloth.

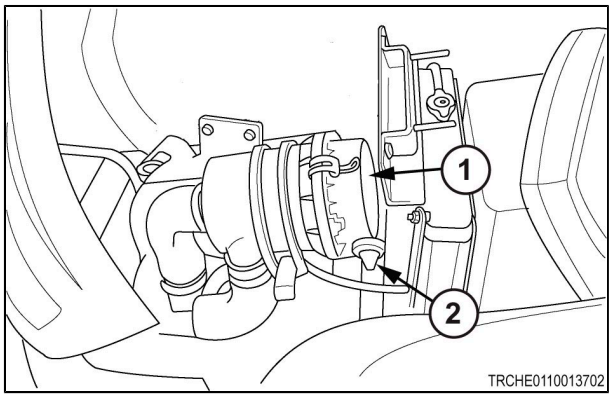


Fig. 20

The air filter (1) is an dry paper element that filters dust particles from the intake air.

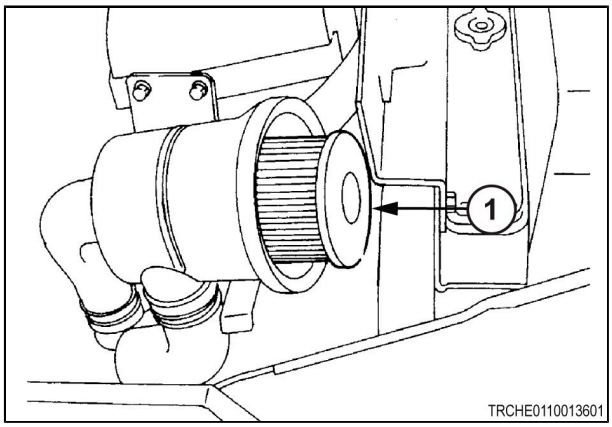


Fig. 21

4.7.1 Clean the engine air filter

The air filter (1) can be cleaned (if in good condition).

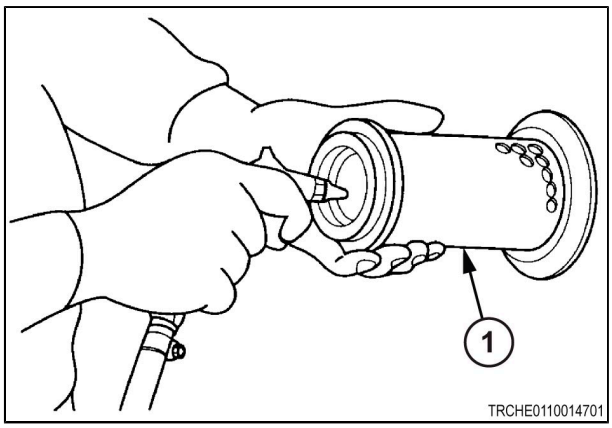


Fig. 22

Procedure

1. Remove loose dirt, grass, chaff, and other debris using compressed air not more than 200 kPa(30 psi) from inside the element. Be careful not to damage the element pleats with air flow.
2. After the element is clean, examine the element for pin holes, punctures, or tears. If the element paper, canister or seal show any signs of damage, replace the element.

IMPORTANT: *Do not hit the filter element against a rock, concrete or other hard item when cleaning. This can result in damage of the filter element, reducing engine performance.*

NOTE: *Replace the air filter after washing five times.*

4.8 Fuel system

WARNING: Fire hazard. Fuel safety.

Personal injury, death, or machine damage can occur.

Stop the engine and let the engine cool before fueling. Never smoke while fueling the machine.

IMPORTANT: *Do not tamper with the injection pump or the injector adjustments. Tampering will cause severe engine damage or engine failure. The warranty will not cover a machine with tampering.*

Use only clean ultra low sulfur diesel fuel of correct grade. Water or dirt in the fuel tank or other parts of the fuel system can cause repeated blockage of the fuel filter and possible injection pump damage.

Keep the area around the fuel cap clean and use only clean diesel fuel to prevent dirt and water from getting into the fuel tank when filling.

Do not let the fuel tank go completely empty.

Keep the fuel tank full to reduce condensation.

4.8.1 Fuel filter

The fuel filter assembly (1) is on the left side. The fuel filter removes particles in the fuel before the fuel gets to the injection pump. The fuel filter assembly has a valve (2) to help with filter replacement and to bleed the air from the fuel system.

Examine and clean the filter bowl to remove deposits of sediment or water

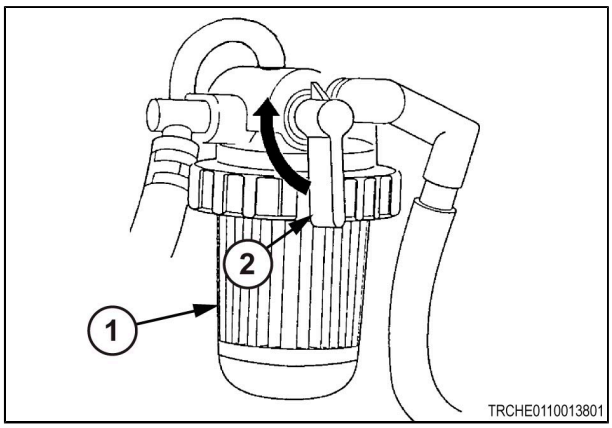


Fig. 23

4.8.2 Replace the fuel filter

Procedure

1. Carefully loosen the spanner nut (1).
2. Remove the spanner nut, sediment bowl (2), and O-ring (3).
3. Clean the sediment bowl.
4. Pull down on the filter element (4) and discard.
5. Examine the small O-ring (5) in the filter head and replace as necessary.
6. Install the new filter into the housing until it's seated.
7. Install the sediment bowl, O-ring, and spanner nut.
8. Tighten the spanner nut.
9. Clean up the spilled fuel and open the valve.

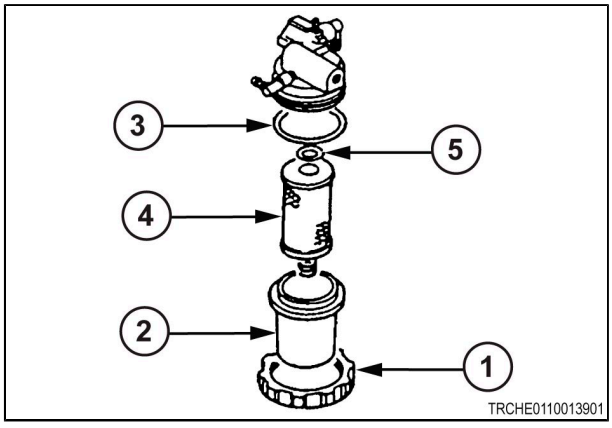


Fig. 24

4.8.3 Remove air from the fuel system

Before starting the procedure

If any of the following conditions have occurred, bleeding the fuel system is necessary:

- The fuel tank is empty.
- The fuel lines, the filter elements, and other components within the system have been disconnected or removed.
- The engine has not operated for a long period of time.
- The engine fails to start, or starts but stops again after a short time of operation.

Procedure

1. Fill the fuel tank.
2. Turn the fuel filter valve (1) to the open (ON) position.
3. Loosen filter air bleed screw (2) and let out the air bubbles.
4. Loosen air bleed screw (3) on the fuel injection pump, and let out air bubbles from the fuel injection pump.
5. Tighten the injection pump air bleed screw.
6. Tighten the filter air bleed screw.

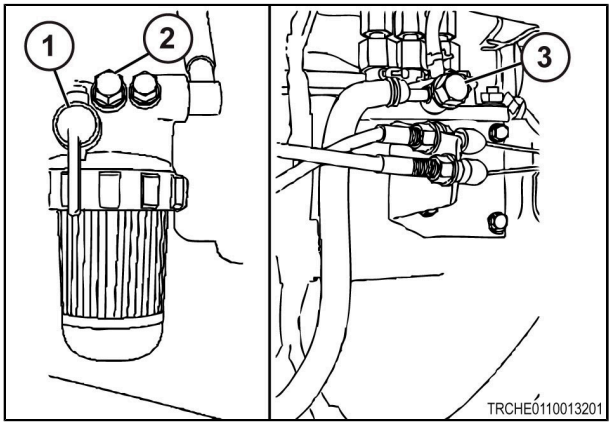


Fig. 25

4.8.4 Fuel tank filler cap

When the fuel tank filler cap is removed, a hissing or popping noise can be heard. This is because of the cap design and is a normal condition. Do not change the cap or use an unapproved replacement as fuel leakage can occur during possible machine upset.

4.8.5 Fuel system components

(1) Fuel tank
(2) Filter valve
(3) Fuel pump
(4) Injection pump

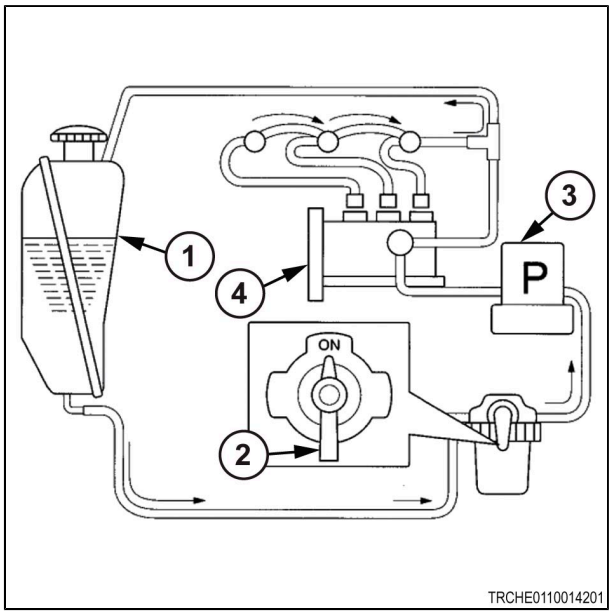


Fig. 26

4.8.6 Hand throttle lever

The hand throttle lever must remain in the position selected by the operator. Through normal use, friction against the hand throttle lever can decrease, causing the hand throttle lever to move out of the selected position. Turn the adjusting nut (1) as required to hold the hand throttle lever in the selected position.

NOTE: *Remove the steering column cover and the instrument panel to get access to the adjusting nut.*

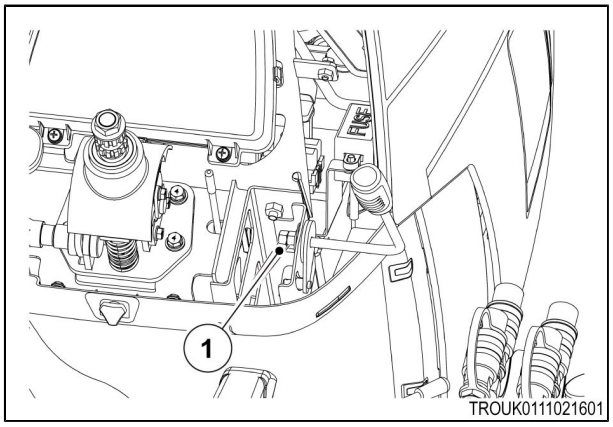


Fig. 27

4.9 Electrical system

4.9.1 Battery

WARNING:
Never disassemble the battery.

WARNING:
When charging the battery from an external source, set charging voltage below 16 volts. Set charging ampere below 1/10 (one tenth) of the battery capacity.

WARNING:
When connecting and disconnecting the battery cables, turn off the power of the battery charger. If you have any questions about the battery, consult you dealer.

CAUTION:
Batteries produce explosive hydrogen gas when charged. Keep all sparks and open flames away from the battery.

CAUTION:
When necessary to disconnect the battery cables, always disconnect the grounded (-) cable first to prevent short circuits.

CAUTION:
Batteries contain sulfuric acid electrolyte (fluid). Wear eye and face protection. If electrolyte comes in contact with skin or clothes, wash immediately. Contact a physician if electrolyte is ingested or gets in eyes.

The battery (1) is located under the engine cover in front of the instrument panel. Open the engine cover to remove the battery or to clean the battery cables.

Keep the top of the battery clean. Make sure the cable connections are clean and tight. Debris on the battery can cause discharge of the battery and fire.

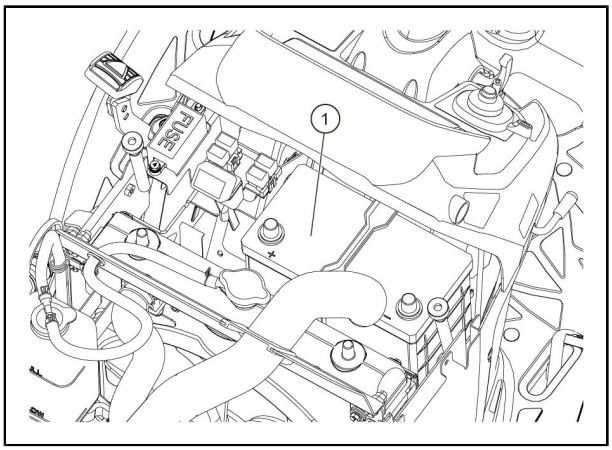


Fig. 28

The battery indicator (1) color shows the battery condition. When checking the battery, park the machine on a level surface and check the indicator at the top of the battery.

If the indicator shows a clear or light green color, tap the battery body to remove the bubble inside the indicator.

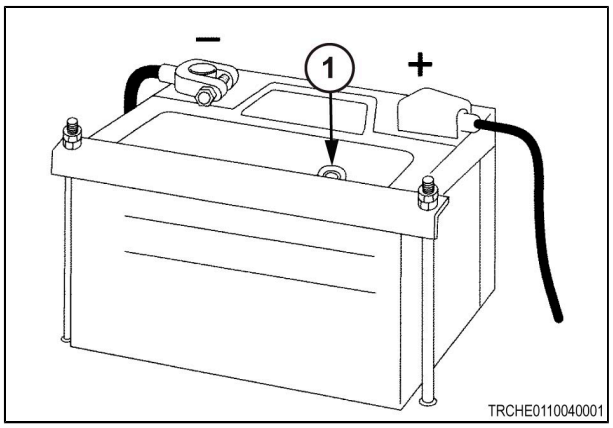


Fig. 29

Indicator Color		Condition	Correction
	Green	Charged	Usable
	Black	Discharged	Charge battery
	Clear	Low electrolyte	Replace battery

If battery performance is questioned, the battery can be removed and charged from an external source following the battery charger instructions. Repeated battery charging can be caused by a defect in the machine charging system and/or a defective battery.

NOTE: *When charging the battery from an external source, the battery temperature must not become more than 54 degrees C (125 degrees F). If the battery does become too hot, reduce or stop the charge rate.*

4.9.2 Replace the battery

Before starting the procedure

IMPORTANT: *Do not reverse the battery cable connections as severe electrical system damage will result.*

IMPORTANT: *Never close or cover the vent of the battery.*

The battery is a maintenance free type. It is not necessary to add water to the battery.

Procedure

1. Disconnect the negative (-) cable (1) first.
2. Disconnect the positive (+) cable (2).
3. Remove the battery retaining clamp.
4. Remove the battery.
5. Install the battery.

   NOTE: *The replacement battery must be the same size and the same capacity.*
6. Install the battery retaining clamp.
7. Install the positive (+) cable first.

   The positive cable connects to the starter solenoid.

   IMPORTANT: *Do not reverse the battery cable connections. This will cause electrical system damage.*
8. Install the negative (-) cable.

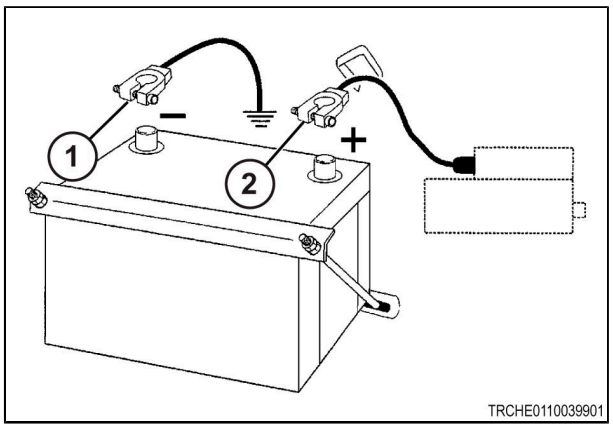


Fig. 30

The negative cable connections to the machine frame.

4.9.3 Start the engine with a booster battery

DANGER:

Bypass starting may override neutral start switches causing death or serious injury.

The neutral start switch system is designed to prevent starting the machine in gear. Any manual override of this system can cause death or serious injury.

Never connect booster cables to the starter terminals or short across the starter terminals.

DANGER:

When connecting a booster battery or auxiliary power source to the tractor battery as a starting aid, ALWAYS connect the jumper cables as described to prevent possible explosion of hydrogen gas released by the batteries.

DANGER:

Gas given off by batteries is explosive! To avoid personal injury or damage to battery, avoid sparks near batteries.

Procedure

1. Make sure the main switch is in the OFF position.
2. Connect one end of the jumper cable to the positive post of the booster battery.
3. Connect the other end to the positive post on your battery.
4. Connect one end of the second jumper cable to the negative post of the booster battery.
5. Connect the other end to a clean chassis ground on your tractor.
6. Start the machine.
7. Disconnect the jumper cable from the chassis ground on your tractor first.

   IMPORTANT: *Make sure the clamp does not touch any other metal while the other end of the cable remains fastened to the starting aid.*
8. Disconnect the jumper cable from the negative post of the booster battery.
9. Disconnect the jumper cable from the positive post on your battery.
10. Disconnect the jumper cable from the positive post of the booster battery.

4.9.4 Fuses

WARNING: Electrical system failure.

Serious personal injury or major damage to equipment and components can occur.

Check all electrical systems and connections after working on the machine and before returning the machine to normal operation.

WARNING: Wiring and fuse modification.

Fuse protection and safety features can be bypassed causing personal injury or death.

Do not change the wiring or fuses.

CAUTION: Negative ground system.

Positive circuits can short circuit and be a potential personal injury or fire hazard.

Insulate and shield positive circuits.

WARNING: Fire hazard. Electrical system failure.

Personal injury or machine damage can occur.

Do not replace any fuse with a fuse of higher amperage rating. Do not use wire or foil to bypass the fuse protection.

IMPORTANT: *If fuses blow repeatedly, examine the electrical system for grounded or shorted circuits.*

4.9.4.1 Fuses locations

CAUTION:
Keep all wiring connections clean and tight. Make sure wiring is correctly secured to prevent damage.

CAUTION:
Do not alter wiring by adding homemade extensions or replacements. Doing so can eliminate fuse protection and/or eliminate safety features of the system.

CAUTION:
The machine is equipped with a negative (-) ground system. Machine metal parts provide many electrical connections. For this reason, all positive (+) circuits must be insulated to prevent grounding or short circuits and prevent possible fire.

CAUTION:
Do not replace any fuse with a fuse of higher amperage rating. Do not use wire (or foil) to bypass fuse protection. A fire can result.

CAUTION:
If fuses blow repeatedly, examine electrical system for grounded or shorted circuits.

The main fuse box (1) is located on the right side at the rear of the engine.

Slow blow fuses (2) are located above and to the right of the battery. Slow blow fuses are inline fuses that protect a circuit by melting when a sustained heavy electrical load or short circuit is found. Slow blow fuses give a delayed action to prevent current break when short surges are found.

IMPORTANT: *Fuses have a specific amperage for the circuit. Do not replace fuses with unauthorized parts.*

IMPORTANT: *Failure of the alternator circuit slow blow fuse is normally caused by incorrect polarity (such as reversed cables when using a booster battery). A failed fuse will not let the battery be charged during normal operation.*

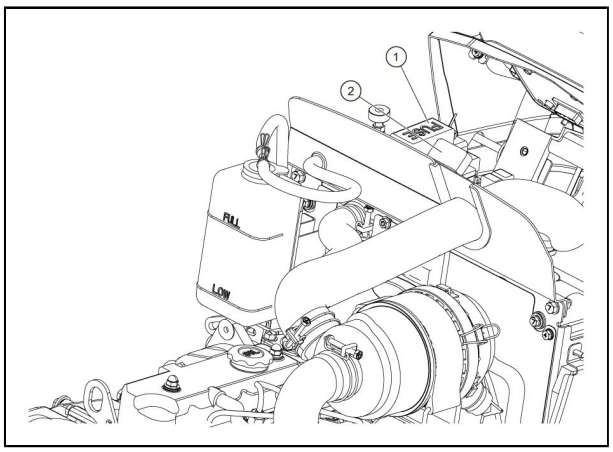


Fig. 31

Ref	Amp	Function
(1)	10A	Turn signals, hazard lamps
(2)	10A	Headlamp and tail lamps
(3)	20A	Outlet/Front
(4)	5A	Glow signal
(5)	10A	Engine solenoid
(6)	10A	Accessory power
(7)	10A	Instrument panel, engine start system
(8)	10A	Work lamp
(9)		Not used
(10)		Not used
(11)	40A	A slow blow fuse that is green and protects the alternator circuit.
(12)	40A	A slow blow fuse that is green and protects the main circuit.

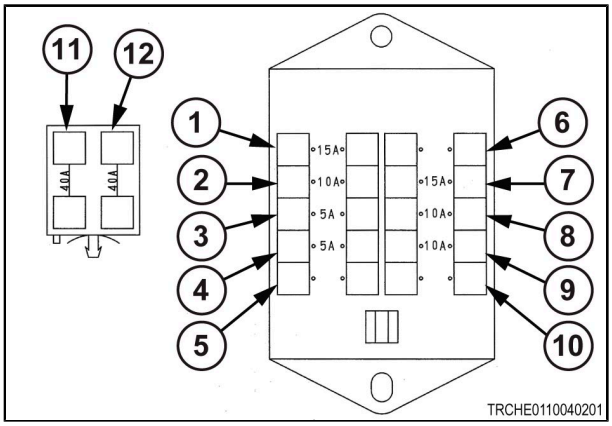


Fig. 32 Main fuse box components

4.9.5 Neutral start switches

WARNING:
Do not bypass or modify the neutral switch. If the neutral start system does not operate properly, see your dealer immediately.

The machine is equipped with a neutral start system made up of neutral switches and a relay. To start the machine:

- Sit in the operator's seat.
- Put the range gear shift lever in the neutral position.
- Put the power take-off clutch lever in the OFF position.

4.9.6 Spare power supply

A spare power supply receptacle (1) is located at the rear of the machine on the left-hand side of the top link. Use a male bullet connector 4 mm (0.2 in) with 0.85 mm^2(18 ga) wire size.

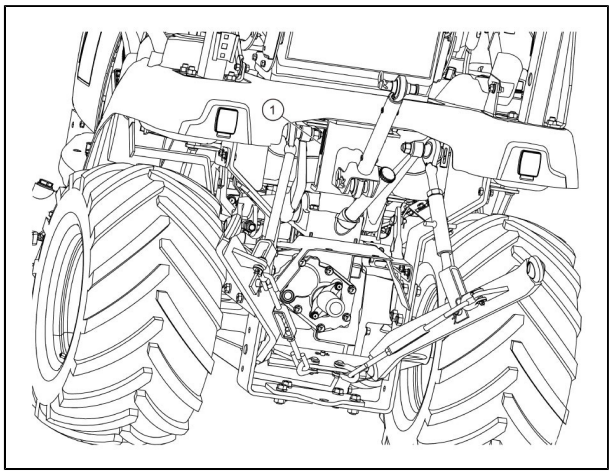


Fig. 33

4.10 Adjust the brakes

The correct free play (A)of the brake pedal is 30 mm to 40 mm(1 1/8 in to 1 3/4 in).

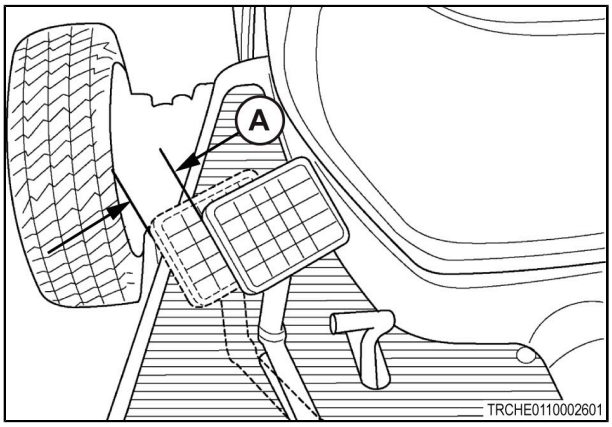


Fig. 34

Procedure

1. Loosen the right-hand thread lock nut (1).
2. Loosen the left-hand thread lock nut (2).
3. Adjust the turnbuckle (3) so free play is correct for the brake pedal.
4. Tighten the lock nuts.
5. Examine the operation of the brakes.

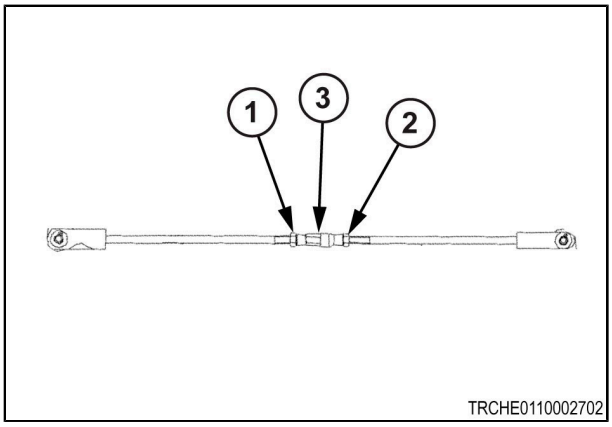


Fig. 35

4.11 Hydrostatic adjustments

For adjustments of the hydrostatic linkage, see your dealer.

4.12 Steering system

4.12.1 Steering free play

WARNING: Machine control hazard.

Personal injury or machine damage can occur.

Excessive steering free play must be corrected before use.

Check steering for excessive looseness, as indicated by steering wheel free play. Maximum free play (1) is approximately 30 mm (1.25 in) when measured at outside of the steering wheel rim.

Excessive free play can be caused by:

- Air in the steering system
- Worn or damaged power steering unit
- Worn or damaged steering cylinder

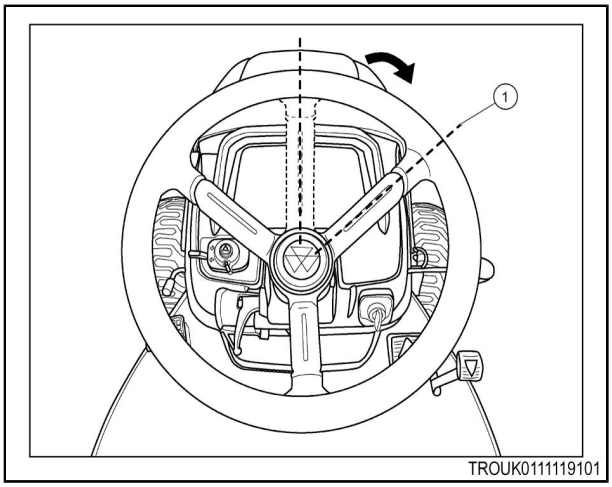


Fig. 36

4.12.2 Adjust the front wheel alignment

The correct toe-in dimensions of the front wheels (A) minus (B) are 2 mm (0.1 in) to 6 mm (0.2 in).

NOTE: *Measure toe-in from the tire center to the tire center at a point halfway up on the face of each tire.*

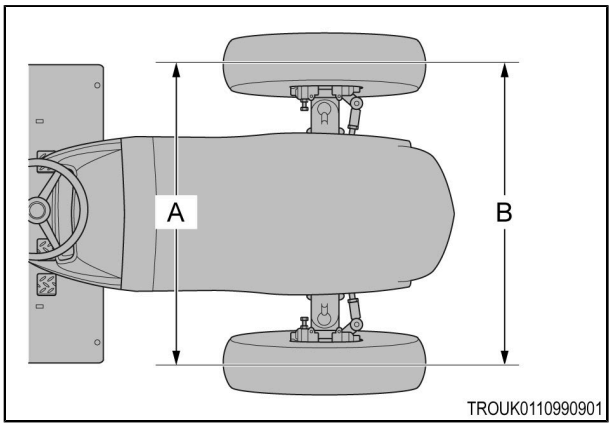


Fig. 37

Procedure

1. Remove the rod end from the case, by loosening the cotter pin and castle nut.
2. Loosen the lock nut.
3. Rotate the tie rod to adjust.

   NOTE: *Adjust each side evenly.*
4. Tighten the lock nut.

   NOTE: *The tie rod ball joints must rotate freely in the cylinder ends. The ball joints must move freely after the nuts are tightened.*

5. Install the rod end to the case, by the cotter pin and castle nut.
6. Install the cotter pin.

4.13 Wheels

4.13.1 Wheels and tires

Examine the wheels and the tires periodically for:

- Correct tire pressures
- Tight wheel hardware
- Any damage that can be dangerous to the tractor operation and the operator safety

Correct the condition before operating the tractor.

Correct tire pressure will help keep the tires in good condition.

If a tire has deep scratches, cuts, or punctures, have the tire repaired or replaced by qualified personnel as soon as possible.

IMPORTANT: *If a tire replacement is necessary, the same tire dimension must be installed to keep the correct front/rear axle ratio.*

AG and R-4 tire arrangement must be kept at a 1 to 5 percent front wheel lead ratio. Turf tire arrangement must be kept at a 1 to 3 percent front wheel lead ratio.

4.13.2 Wheel bolt torque

CAUTION:
Correct wheel bolt torque must be maintained. Installation of front or mid mounted implements (for example: loaders, mowers) increase loads and require frequent examination of wheel bolts.

Periodically, examine the wheel bolts torque on the front (1) and rear (2) wheels.

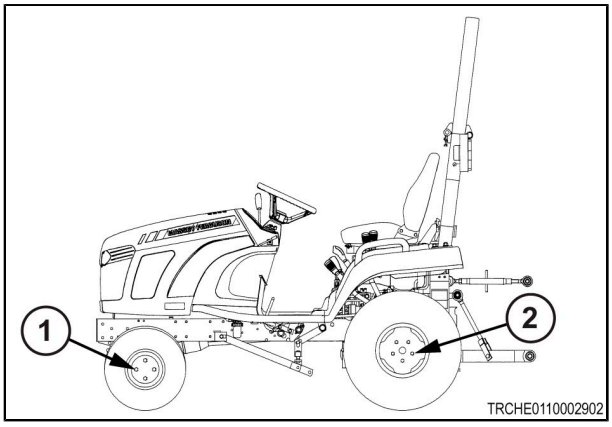


Fig. 38

4.13.3 Wheel bolt torque chart

Wheel bolts	Torque
Front wheel bolts	147 Nm(108 lb ft)
Rear wheel bolts	95 Nm(70 lb ft)

4.14 Prepare tractor for storage

If tractor is to be stored for extended time, such as off-season times, correct maintenance must be made to protect the tractor. The maintenance will be different in the geographical area and storage season.

Procedure

1. Replace the engine oil and the filter.
2. Operate at low idle five minutes to lubricate parts.
3. Lubricate all grease fittings and lightly lubricate the control linkage pivots.
4. Remove implements.
5. Keep the tractor in an enclosed area, if possible, for protection from the weather.
   If the tractor cannot be kept in an enclosed area, use a cover. Cover the exhaust pipe to keep rain or snow out of the exhaust pipe.
6. Lift the tractor and put stands below the axles to remove weight from the tires.
7. Lift and lock the 3-point linkage in the up position. Turn the rate of lower knob (1) fully clockwise.

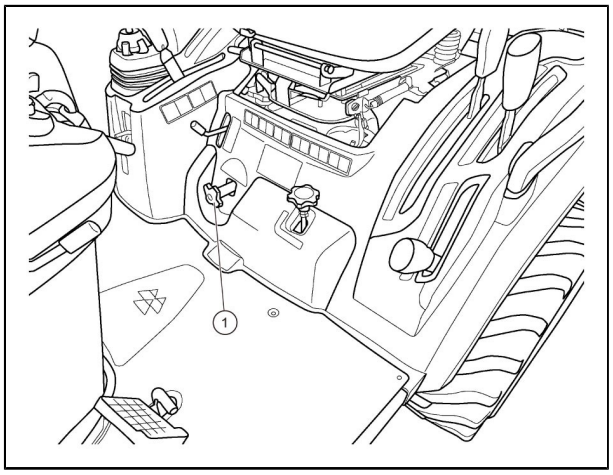


Fig. 39

8. Press the clutch pedal to secure in the disengaged position with the hook.

   Result

   Fastening the clutch in the disengaged position will prevent seizure during long periods of storage.
9. Add a fuel conditioner to the fuel tank.
10. Fill the fuel tank to prevent condensation in the fuel tank. Fill with fuel tank winter fuel before winter.
11. Remove the battery and keep in cool dry location.
    Keep the battery charged during storage period.
12. Put a cover on the air filter inlet.
13. Make sure the engine coolant mixture is correct.
14. Touch up scratches with paint.

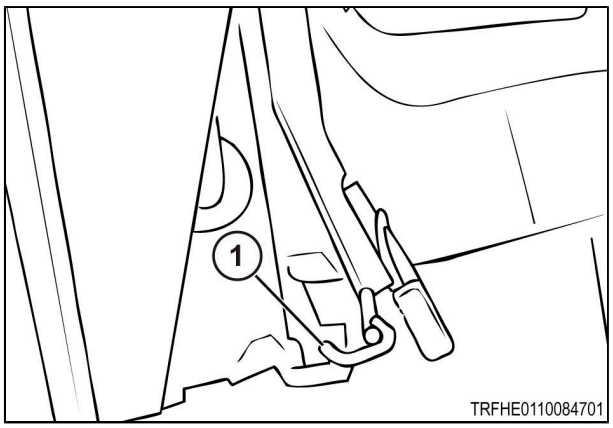


Fig. 40

4.15 Power washing

When cleaning the machine with a power washer:

- Keep the tip at least 1 m (3 ft) (A) from the machine.
- Use a fan spray nozzle (1), not a stream nozzle (2).

IMPORTANT: *If a high pressure washer is used, follow the instructions in the operator manual and safety signs for the power washer. Not using correctly can cause personal injury or damage to the machine.*

Not using a power washer correctly can cause:

- Damage to electrical parts or a fire caused by a short circuit
- Damage to hydraulic hoses causing an oil leak
- Removal of decals and safety signs
- Damage to engine or radiator
- Damage to rubber and plastic parts
- Paint removal

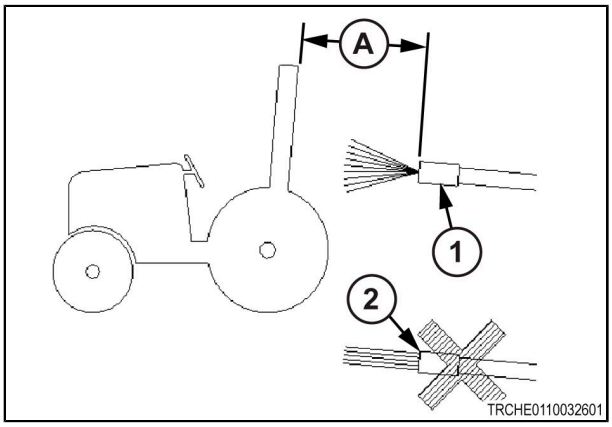


Fig. 41

5 Troubleshooting

5.1 Engine troubleshooting 129
5.2 Brakes troubleshooting 133
5.3 Hydraulic system troubleshooting 134
5.4 Steering system troubleshooting 135
5.5 Electrical system troubleshooting 136
5.6 Hydrostatic transmission troubleshooting 137

5.1 Engine troubleshooting

Starter motor does not operate with the key turned to start	
Cause(s)	Solution(s)
Range gear shift lever not in neutral	Put the range gear shift lever in neutral
PTO clutch lever engaged	Move the PTO clutch lever to the off position
Blown fuse	Replace the fuse
Broken neutral switch	See your dealer
Discharged battery	Charge the battery
Loose or dirty terminals	Clean and tighten securely
Broken main switch	See your dealer
Broken starter	See your dealer

Starter motor operates but not at full speed	
Cause(s)	Solution(s)
Discharged battery	Charge the battery
Loose or dirty terminals	Clean and tighten securely
Ground not clean	Clean and tighten the starter mounting
Ground not fastened correctly	Tighten the starter mounting
Oil viscosity not correct	Replace with oil of correct viscosity
Engine not operating correctly	See your dealer

Starter motor operates but the engine does not start	
Cause(s)	Solution(s)
Electric fuel solenoid not operating	See your dealer
Air in the fuel system	Bleed the fuel system
Obstruction in the fuel filter	Clean the filter
Fuel is not being supplied	Examine the fuel level
	Open fuel valve
Not correct preheating procedure	Longer use of heater
Engine not operating correctly	See your dealer

Irregular engine running	
Cause(s)	Solution(s)
Air in the fuel system	Bleed the fuel system
Obstruction in the fuel filter	Clean the filter

Irregular engine running	
Cause(s)	Solution(s)
Obstruction in fuel injectors	See your dealer
Fuel line is leaking air	Tighten clamps, replace damaged pipes
Engine not operating correctly	See your dealer
Old fuel	Replace the fuel
Fuel injection pump timing not correct	See your dealer

When decelerated, engine stops	
Cause(s)	Solution(s)
Low idle setting not correct	See your dealer
Fuel injection pump not operating correctly	See your dealer
Valve clearance not correct	See your dealer

Engine over-speeds	
Cause(s)	Solution(s)
Fuel injectors not operating correctly	See your dealer
High speed setting not correct	See your dealer
Engine oil is getting into combustion chambers	See your dealer
Governor not operating correctly	See your dealer

Engine stops unexpectedly during operation	
Cause(s)	Solution(s)
Not enough fuel supply	Top up fuel and bleed fuel system
Fuel injectors not operating correctly	See your dealer
Fuel injection pump not operating correctly	See your dealer
Engine seizure because of low or poor oil	See your dealer
Broken neutral switch	See your dealer

Engine overheats	
Cause(s)	Solution(s)
Not enough coolant	Top up coolant
Broken or loose fan belt	Adjust belt tension or replace
Obstruction of the grille, radiator screens	Clean
Obstruction of the radiator fins	Clean

Engine overheats	
Cause(s)	Solution(s)
Thermostat not operating correctly	See your dealer
Not enough engine oil	Inspect the oil level and fill if necessary

Exhaust fumes are white	
Cause(s)	Solution(s)
Obstruction of air cleaner	Clean or replace element(s)
High engine oil level	Inspect the oil level and correct
Not enough fuel delivery	See your dealer
Cold-running engine	Let the engine warm, examine the thermostat

Exhaust fumes are too black	
Cause(s)	Solution(s)
Poor fuel	Replace with better grade
Excessive fuel delivery	See your dealer
Not enough fuel injector pressure	See your dealer
Not enough combustion air	Examine, clean or replace the air filter

Poor engine output	
Cause(s)	Solution(s)
Fuel injectors will not move and/or carbon deposit	See your dealer
Not enough compression or leaking valves	See your dealer
Valve clearances not correct	See your dealer
Fuel injection timing not correct	See your dealer
Not enough fuel supply	Examine the fuel system
Obstruction of the air cleaner	Clean or replace the elements(s)

Engine oil pressure indicator is illuminated during operation	
Cause(s)	Solution(s)
Not enough engine oil	Inspect the oil level and fill if necessary
Too low oil viscosity	Replace with oil of correct viscosity
Pressure switch not operating correctly	See your dealer
Obstruction in the oil filter	Replace element cartridge
Oil pump not operating correctly	See your dealer

Battery charge indicator is illuminated during operation	
Cause(s)	Solution(s)
Wiring not correct	Correct loose or dirty terminals, short circuit, poor ground, etc.
Alternator not operating correctly	See your dealer
Regulator not operating correctly	See your dealer
Battery not charging correctly	Replace the battery
Loose or damaged fan belt	Adjust the belt tension or replace

5.2 Brakes troubleshooting

Brakes to not work well	
Cause(s)	Solution(s)
Too much free play of pedals	Adjust the free play
Brake lining is worn or will not move	See your dealer

Brake pedal does not return smoothly	
Cause(s)	Solution(s)
Broken return spring	Replace the return spring
Poor lubrication	Remove rust, then apply lubricant

5.3 Hydraulic system troubleshooting

Not enough oil pressure	
Cause(s)	Solution(s)
Low engine speed	Increase speed
Low transmission oil	Fill to specified level
Intake piping is sucking air	Tighten clamps or replace damaged pipes and O-rings
Obstruction in the oil filter	Clean or replace
Hydraulic oil pump not operating correctly	See your dealer
Control valve not operating correctly	See your dealer
Broken cylinder	See your dealer

Leaking hydraulic lines	
Cause(s)	Solution(s)
Loose joints	Tighten
Damaged lines	Replace lines and O-rings

3-Point linkage does not lower	
Cause(s)	Solution(s)
Lowering rate valve closed	Turn the lowering rate knob counterclockwise
Control valve not operating correctly	See your dealer
Broken cylinder	See your dealer
Lift shaft bearing will not operate	See your dealer

5.4 Steering system troubleshooting

Steering wheel is hard to turn or turns in one direction	
Cause(s)	Solution(s)
Steering column not correctly installed	Correct the steering column
Air in steering hydraulic system	Bleed the steering system
Obstruction in the suction filter	Remove and clean
Toe-in not correct	Correct toe-in
Different front tire inflation	Inflate both tires to same pressure
Steering unit and/or pump not operating correctly	See your dealer

Steering wheel has too much free play	
Cause(s)	Solution(s)
Worn steering column	See your dealer
Oil leaking	Replace pipes and/or O-rings
Steering unit not operating correctly	See your dealer
Loose steering or joints	Tighten or replace damages or worn parts

5.5 Electrical system troubleshooting

Battery cannot be charged	
Cause(s)	Solution(s)
Blown fuse	Examine the fuse and replace
Wiring not correct	Correct loose, dirty terminals, short circuit, poor ground, etc.
Loose or damaged fan belt	Give belt the correct tension or replace
Battery not charging correctly	Correct loose terminal connection, corrosion, or replace battery
Alternator not operating correctly	See your dealer
Regulator not operating correctly	See your dealer

Headlamps are dim	
Cause(s)	Solution(s)
Discharged battery	Charge battery. Examine the charging system.
Poor connections	Examine the ground points and terminals. Clean and tighten

Specific function will not operate	
Cause(s)	Solution(s)
Burned out bulb	Replace
Blown fuse	Examine the fuse and replace
Poor contact	Inspect the ground points and terminals; clean if necessary
Switch not operating correctly	Replace as required

5.6 Hydrostatic transmission troubleshooting

Tractor does not move	
Cause(s)	Solution(s)
Parking brake is applied	Release the parking brake
Engine rpm too low	Increase engine rpm
Low transmission oil level	Examine the level and fill as necessary
Air in the system	See your dealer
Hydrostatic pedal not adjusted correctly	See your dealer
Obstruction in the transmission oil filter	Replace
Obstruction in the suction filter	Replace
Hydrostatic unit not operating correctly	See your dealer

Tractor moves without operating the hydrostatic pedal	
Cause(s)	Solution(s)
Neutral arm stuck	See your dealer
Neutral adjustment not correct	See your dealer
Hydrostatic unit not operating correctly	See your dealer

Hydrostatic pedal does not go back to neutral	
Cause(s)	Solution(s)
Hydrostatic linkage adjustment not correct	See your dealer

6 Specifications

6.1 Specifications 141
6.1.1 Lubrication specifications 141
6.1.2 Capacities 141
6.1.3 Engine specifications 142
6.1.4 Electrical specifications 142
6.1.5 Fuel specifications 143
6.1.6 Front axle specifications 143
6.1.7 Hydraulic specifications 143
6.1.8 Power take-off specifications 144
6.1.9 Transmission specifications 144
6.1.10 Maximum load capacity 145
6.1.11 Tire inflation pressures 145
6.2 Dimensions 146
6.2.1 Tractor dimensions 146
6.3 Bolt torque 148
6.3.1 Bolt torque chart 148
6.3.2 Wheel bolt torque chart 148

6.1 Specifications

Specifications and design are subject to change without notice and without liability.

6.1.1 Lubrication specifications

IMPORTANT: *Examine fluid levels after filling.*

AGCO Genuine lubricants are the recommended products for this machine. The use of other lubricants may not give the same level of necessary performance.

Component	Specifications	
Grease fitting	AGCO Multi-Purpose Lithium II Grease or equivalent	
Engine oil	Massey Ferguson Multiguard® or equivalent in the correct SAE viscosity. Oil must meet or exceed requirements API service classification CJ-4 class	
	Recommended Viscosity:	
	Between -35 °C and 40 °C (-31 °F to 104 °F)	SAE 5W-30
	Between -20 °C to 40 °C (-4 °F to 104 °F)	SAE 10W-30
Engine coolant	50/50 mixture ethylene glycol and water	
	Freezing protection (original factory fill)	-34° C (-30° F)
Transmission and differential housing (including hydraulic system)	Permatran® 821 XL or equivalent	
Front axle	Permatran® 821 XL or equivalent	

6.1.2 Capacities

IMPORTANT: *The capacities listed are approximate. Examine fluid levels after filling.*

AGCO Genuine lubricants are the recommended products for this machine. The use of other lubricants may not give the same level of necessary performance.

Engine oil

	All models
Quantity with filter change	2.6 liters (2.7 US qt)

Cooling system

	All models
Quantity	4.6 liters (4.9 US qt)

Fuel tank

	All models
Quantity	25 liters (6.6 US gal)

Front drive axle

	All models
Quantity	3.7 liters (4.1 US qt)

Transmission and differential housing (including hydraulic system)

	All models
Quantity	11 liters (2.9 US gal)

6.1.3 Engine specifications

Engine

	1GC23	1GC25
Model	E3112-XB03	E3112-XB02
Type	4 stroke diesel engine	
Aspiration	Natural	
Fuel injection	Swirl	
Rated power (gross estimate)	16.8 kW 22.5 hp) at 2600 rpm	17.9 kW (24.0 hp) at 3000 rpm
Rated power (net estimate)	16.1 kW (21.6 hp) at 2600 rpm	17.6 kW (23.9 hp) at 3000 rpm
Rated power (540 PTO)	13.6 kW (18.3 hp)	13.8 kW (18.5 hp)
Low idle	1325 rpm to 1375 rpm	
High idle	2760 rpm to 2860 rpm	3170 rpm to 3270 rpm
Firing Order	1-3-2	1-3-2
Number of cylinders	3	3
Compression ratio	22.5 to 1	
Bore	78.2 mm (3.08 in)	
Stroke	78 mm (3.07 in)	
Displacement	1123 cc (68.5 cu in)	
Engine cooling	Liquid, forced circulation	
Air cleaner	Single stage, dry element	
Cold start help	Glow plugs	
Valve clearance: intake and exhaust, hot or cold	0.25 mm (0.010 in)	

6.1.4 Electrical specifications

	All models
System voltage	12 Volt
Grounding	Negative

	All models
Battery cold cranking amperes (cca) @ - 18 degrees C(0 degrees F)	433 CCA
Charging system	40 ampere alternator with internal regulator/rectifier

Battery case size

	All models
Length	238 mm (9 3/8 in)
Width	122 mm (4.8 in)
Height	203 mm (8 in)

6.1.5 Fuel specifications

	All models
Type	Ultra low sulfur fuel only
Above 4 °C (39 °F)	No. 2-D
Below 4 °C (39 °F)	No. 1-D

6.1.6 Front axle specifications

	1GC23		1GC25	
	AG tire	Turf tire	AG tire	Turf tire
Engagement	Mechanical			
Joint axle	Bevel gear			
Turn angle	Left turn: 53°			
	Right turn: 49°			
Oscillation angle	6° to 8°			
Steering	Hydraulic			
Front wheel drive ratio	1.4905 to 1			

6.1.7 Hydraulic specifications

Main hydraulic

	1GC23	1GC25
Pump	Transmission mounted gear pump	
Maximum output	22.7 liter/min (6.0 US gal/min)	26.3 liter/min (6.9 US gal/min)
System pressure (relief valve)	13244 kPa (1920 psi)	

Steering system

	All models
Type	Steering control unit
Pump	Transmission mounted gear pump with flow divider
Maximum output	7.5 liter/min (2.0 US gal/min)
Pressure relief valve	8339 kPa (1209 psi)

Rear linkage

	All models
Type	3-point linkage
Size	Category 1
Control	Lift control valve
Lift capacity	540 kgf (1191 lbf) measured at ball ends

6.1.8 Power take-off specifications

	All models
Type	Independent, engine driven
Control	Hydraulic control
Clutch	Mechanically engaged, multi-plate wet disk

Rear PTO shaft

	GC1723E	GC1725M
Type	35 mm (1.375 in) diameter, six spline	
Output	Clockwise rotation	
Engine speed at 540 PTO rpm	2532 rpm	2829 rpm

Mid PTO shaft

	GC1723E	GC1725M
Type	25.4 mm (1 in) diameter, 15 spline	
Output	Clockwise rotation	
Engine speed at 540 PTO rpm	2476 rpm	2947 rpm

6.1.9 Transmission specifications

	All models
Type	Hydrostatic
Transmission speeds	Infinite (to maximum speed)
Range transmission	2-speed constant mesh

	All models
Clutch	None
Brakes	Mechanically actuated, sealed wet disk

6.1.10 Maximum load capacity

Location	Weight
Front axle capacity	880 kg (1940 lb)
Rear axle capacity	950 kg (2094 lb)
Maximum load capacity	1220 kg (2690 lb)

6.1.11 Tire inflation pressures

Tire Type	Tire Location	Tire Size	Pressure kPa(psi)
Ag	Front	18 x 8.50-10	155(23)
	Rear	26 x 12.0-12	140(20)
Turf	Front	18 x 8.50-10	150(22)
	Rear	26 x 12.0-12	140(20)
R4	Front	18 x 8.50-10	150(22)
	Rear	26 x 12.0-12	140(20)

6.2 Dimensions

6.2.1 Tractor dimensions

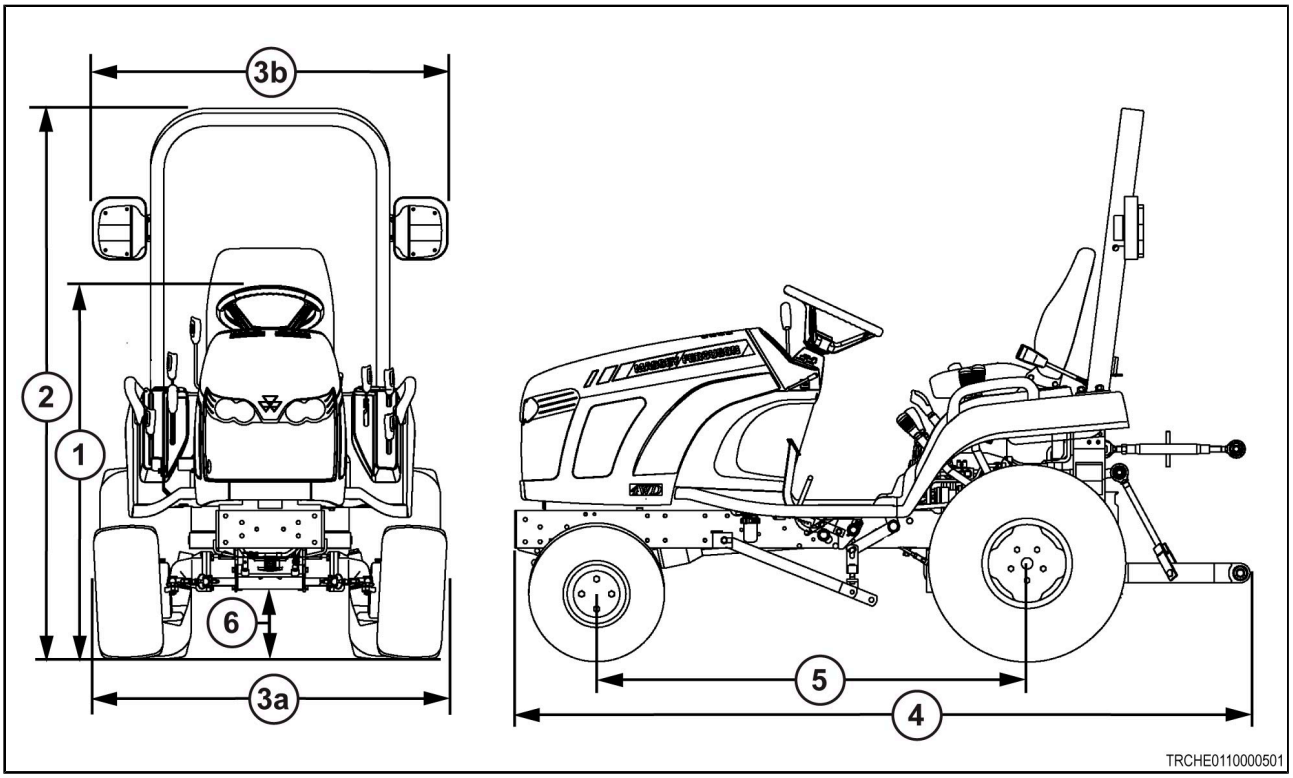


Fig. 1

		1GC23			1GC23 (TLB)			1GC25			1GC25 (TLB)		
		AG tires	R4 tires	Turf tires	AG tires	R4 tires	Turf tires	AG tires	R4 tires	Turf tires	AG tires	R4 tires	Turf tires
(1)	Height of Steering Wheel	1320 mm (52 in)			1320 mm (52 in)			1320 mm (52 in)			1320 mm (52 in)		
(2)	Overall Height ROPS	1850 mm (72.8 in)			2180 mm (85.8 in)			1850 mm (72.8 in)			2180 mm (85.8 in)		
(3a)	Overall Width (tires)	1185 mm (46.7 in)	1185 mm (46.7 in)	1190 mm (46.9 in)	1185 mm (46.7 in)	1185 mm (46.7 in)	1190 mm (46.9 in)	1185 mm (46.7 in)	1185 mm (46.7 in)	1190 mm (46.9 in)	1185 mm (46.7 in)	1185 mm (46.7 in)	1190 mm (46.9 in)
(3b)	Overall Width (combination rear light)	1200 mm (47.2 in)			1375 mm (54.1 in)			1200 mm (47.2 in)			1375 mm (54.1 in)		
(4)	Overall Length	2480 mm (97.6 in)			2480 mm (97.6 in)			2480 mm (97.6 in)			2480 mm (97.6 in)		
(5)	Wheelbase	1450 mm (57.1 in)			1450 mm (57.1 in)			1450 mm (57.1 in)			1450 mm (57.1 in)		
(6)	Minimum Ground Clearance	170 mm (6.7 in)			170 mm (6.7 in)			170 mm (6.7 in)			170 mm (6.7 in)		
Turning Radius without Brake	Right	2550 mm (100.4 in)			2550 mm (100.4 in)			2550 mm (100.4 in)			2550 mm (100.4 in)		
	Left	2400 mm (94.5 in)			2400 mm (94.5 in)			2400 mm (94.5 in)			2400 mm (94.5 in)		

	1GC23			1GC23 (TLB)			1GC25			1GC25 (TLB)		
	AG tires	R4 tires	Turf tires	AG tires	R4 tires	Turf tires	AG tires	R4 tires	Turf tires	AG tires	R4 tires	Turf tires
Weight (bare tractor with R4 tires and wheels) Does not include loader, backhoe, or mounted equipment.	645 kg (1422 lb)			695 kg (1532 lb)			675 kg (1488 lb)			700 kg (1543 lb)		

6.3 Bolt torque

6.3.1 Bolt torque chart

Tighten all fasteners using this torque chart unless a specific torque value is shown.

	4T		7T	
	Nm	lbf ft	Nm	lbf ft
M6	5 to 7	4 to 6	10 to 12	7 to 9
M8	12 to 17	9 to 13	24 to 30	17 to 22
M10	22 to 30	16 to 22	45 to 58	33 to 43
M12	41 to 59	30 to 43	79 to 93	59 to 69
M14	55 to 78	41 to 58	123 to 147	90 to 108
M16	82 to 118	61 to 87	196 to 230	145 to 170
M20	132 to 186	98 to 137	333 to 448	246 to 330

6.3.2 Wheel bolt torque chart

Wheel bolts	Torque
Front wheel bolts	147 Nm(108 lb ft)
Rear wheel bolts	95 Nm(70 lb ft)

7 Accessories

7.1 Accessories 151
7.1.1 Canopy 151
7.1.2 Engine block heater 151
7.1.3 Implements and attachments 151

7.1 Accessories

7.1.1 Canopy

The canopy is a sunshade that attaches to the roll over protective structure (ROPS) to improve operator comfort. The canopy is not designed to offer protection from falling objects.

7.1.2 Engine block heater

The engine block heater is installed through a port in the engine block coolant cavity to assist starting in colder ambient temperatures.

7.1.3 Implements and attachments

Your dealer offers a complete line of implements and attachments, such as mowers, loaders, backhoes, tillers and numerous ground-engaging tools. Please see your dealer for more information.

CAUTION:
If you install a 3-point mounted backhoe on this tractor, this will void the tractor's warranty. Backhoe attachments must have a subframe that attaches to the tractor frame.

IMPORTANT: *Make sure your tractor has the proper ballast for your specific front and/or rear mounted implements.*

8 Assembly

8.1 Checklists 155
8.1.1 Pre-Delivery Inspection checklist 155
8.1.2 Supply checklist 155

8.1 Checklists

8.1.1 Pre-Delivery Inspection checklist

Dealer note, refer to the AGCO Tech Connect for the information of the Pre-Delivery Inspection on the machine.

8.1.2 Supply checklist

- ☐ Make sure that the dealer personnel are on the location when you start the machine in the field. Make sure that all the systems operate correctly. Refer to the Operator's Manual to set up the machine correctly.
- ☐ Make sure that the owner understands the warranty of the machine. Complete the warranty document and record the serial number of the machine. The dealer and the owner must each sign the document.
- ☐ Make sure that the machine operator understands the Safety section. Tell of the decals for dangerous operation procedures and conditions. Tell the owner to read the Operator's Manual with each operator of the machine.
- ☐ If it is necessary, make sure that the operator knows how to adjust, connect, or disconnect other implements to the machine.
- ☐ Make sure that the operator knows the locations and functions of the controls.
- ☐ Tell the operator of the adjustments for different field conditions.
- ☐ Tell the operator that the correct servicing and lubrication is very important.
- ☐ The operator must understand the lamp system when they operate a machine on the road at night and during the day. Use the rear lamps and warning lamps, and the SMV (Slow Moving Vehicle) emblem to warn the operators of other vehicles. Tell the customer to obey the local regulations for the movement of vehicles that are slow and too wide.
- ☐ Give the Operator's Manual to the owner. Make sure that the owner reads all the sections of the manual.

Index

3-point linkage 83, 85
3-point linkage controls
  lift 83
  speed of lower 84

A

agricultural chemicals 23
attachments 151
aux. power outlet 65
auxiliary hydraulic system 92

B

battery 113
  replace 114
battery safety 29
bolt torque chart 148
brake
  adjustment 119
brake pedal 56
brakes
  troubleshooting 133
break-in the tractor 67

C

canopy 151
capacities 141
chassis number 43
cold weather starting 70
controls
  locations 51
cruise control
  set 75
cut height control 84

D

differential lock
  engage 78

E

electrical power outlet
  12V socket 64
electrical specifications 142
electrical system
  troubleshooting 136
emission control warranty statement
  California 45
  United States and Canada 46
engine
  change the oil 99
  coolant 104
  coolant level 104
  examine the oil level 98
  replace coolant 104
  replace the oil filter 100
  specifications 142
  troubleshooting 129
engine air filter 108
  clean 108
engine belt
  adjust 106
  tension 106
engine block heater 151
engine cover
  open 66
engine identification 43
engine safety 27
engine speed control 73
examine before operation 68
exhaust warning 22

F

flammable fuel 34
flying debris 23
four-wheel drive 79
front axle
  change oil 103
  examine oil level 103
front axle oil 103
front axle specifications 143
front wheel alignment
  adjust 121
fuel filter 110
  replace 110
fuel safety 29
fuel specifications 143
fuel system 110
  components 112
  remove air 111
fuel tank filler cap 111
fuses 115
  locations 116

G

general maintenance information 25
general operating information 71
ground speed chart 74

H

hand throttle lever 112
hazard switch 55
headlamp switch 55
high pressure leaks 26
hydraulic ports 89
hydraulic specifications 143
hydraulic system
  troubleshooting 134
hydrostatic adjustments 120
hydrostatic pedals 74
hydrostatic transmission
  troubleshooting 137

I

Identification of the machine 42
implements 151

connect 85
disconnect 86
indicators and gauges 53
information messages 15
instrument panel 52
intended use 41
introduction 41

J

joystick
lockout 88
joystick control lever 87
operation 87

L

lamp switches 55
lift control 83
lubrication
specifications 141
lubrication and maintenance
chart 95
chart for daily inspection 95
lubrication drain locations 97
lubrication fill locations 97
lubrication fittings 97

M

machine components 44
maximum load capacity 145

N

neutral start switches 117
neutral start system
examine 71

P

parking brake 56
personal protective equipment 20
power take-off 80
controls 80
mid 2000 rpm 82
rear 540 rpm 81
power take-off safety 22
power take-off specifications 144
power washing 125
pre-delivery checklist 155
prepare for operation 17
prevent fire and first aid 26

R

range gear shift lever 74
replacement parts 30
roll over protective structure 17
roll-over protective structure 90
rotate the seat
backhoe operation 57
tractor operation 59

S

safety and informational signs location 31
safety general information 17
safety messages 15
safety sign
component separation flying object 37
crush hazard 36
description 32
electrical hazard 32
entanglement hazard - belt 33
entanglement hazard - power take-off 36
fall off or run-over hazard 36
fuel 34
hot pressurized coolant 33
hot surface 32
movement hazard 35
operators manual 35
rear rollover hazard 37
roll-over crush hazard - slope 36
roll-over hazard 34–35
run over hazard 34
shear hazard - engine fan 33
shut off engine 35
starting fluid 33
safety signs 15
safety symbol 15
seat
adjust 57
instruction 21
seat belt 90
serial number plate 42
shield and guards 21
spare power supply 118
specifications 141
electrical 142
engine 142
front axle 143
fuel 143
hydraulic 143
lubrication 141
maximum load capacity 145
power take-off 144
tire inflation pressures 145
tractor dimensions 146
transmission 144
wheel bolt torque 123
wheel bolt torque chart 123, 148
start the engine
with booster battery 115
start the tractor 68–69
steering system
free play 121
troubleshooting 135
steering wheel
adjust tilt 62
adjust tilt lever 62
stop the engine 77
storage 124
supply checklist 155

T

throttle 73
tire inflation pressures 145
tire safety 30
tires
inflation pressures 123
tractor dimensions 146
transmission

change oil and filter 101
examine the oil level 101
transmission oil 101
transmission specifications 144
transport on a trailer 91
travel on public roads 24
troubleshooting
brakes 133
electrical system 136
engine 129
hydraulic system 134
hydrostatic transmission 137
steering system 135
turn indicator switch 55

W

warm engine starting 70
warm up period 70
warning - state of California 32
waste - correct disposal 41
weld on the machine precautions 30
wheel bolt torque 123
wheels
bolt torque chart 123, 148
wheels and tires 123
word to the operator 16