



NorTrac 82XTC Tractor

Owner's Manual

Sold By

Northern Tool & Equipment, Inc.

P.O. Box 1299

Burnsville, MN 55337

Tel.: 1-800-222-5381

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YFXT82OMAN

NorTrac 82XTC Tractor

Product Identification Data Sheet

Product Part Number	
Product Model	
Machine Serial Number	
Chassis Serial Number	
Engine Model	
Engine Serial Number	
Date of Purchase	
Where Purchased/Contact Information	
Owner Name	

Complete this form carefully at purchase.

All SN's in this form should be recorded completely (including letters).



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User Notices

Thank You

Thank you for purchasing a NorTrac tractor from Northern Tool + Equipment Company. We value you as a customer and wish you many years of safe and satisfied use of your tractor.

Using Your Owner's Manual

This Owner's Manual is an important part of your tractor and should remain with the tractor if you sell it.

Failure to follow the tractor break-in procedure will void the warranty on the tractor.

Read this Owner's Manual to help you and others avoid personal injury or damage to the tractor. This manual provides information on the safest and most effective use of the tractor. It will help you and others you might train to operate the tractor safely and correctly.

If you use the tractor with an implement or other attachment, use the safety and operating instructions in the owner's manual for that implement or attachment along with this Owner's Manual so you can operate the implement safely and correctly with the tractor.


While the tractor shown in this manual may differ slightly from your tractor model, the instructions in this manual will apply to your manual unless otherwise stated.

Disclaimer

The 82XTC tractor and its components may be changed by the manufacturer at any time without notice and may not correspond to the contents of this Owner's Manual.

Overview

This manual describes safety precautions as well as running-in, proper usage, technical maintenance, adjustment, faults and troubleshooting methods for various parts of the Nortrac XTC tractors. The manual gives an in-depth look and should be used as a reference tool for owners and maintenance personnel.

In this manual, the safety alert symbol  prompts important safety information. When this symbol is seen, you should be alert to possible injuries or affects to the service performance of the machine.



WARNING: Alerts you to safety hazards that could result in serious injury or even death.



NOTICE: Alerts you to actions that could result in minor injuries or could damage the tractor or its' implements and thus result in possible safety hazards.

IMPORTANT ISSUE: Issues that may result in damage to the tractor, related machinery and/or the environment.

NOTE: Provides additional information on a given topic.

Please read the messages that follow the symbol carefully and make other operators aware of any potentially hazardous situations. This manual is an integral part of the product and should be kept with the tractor. Please keep it in a safe, dry place. If you encounter any sections that you do not understand while going over the manual, please call 1-952-641-2592 for assistance.

Only those familiar with this manual and the characteristics of this machine should be allowed to operate, service and maintain the tractor. In addition, some government regulations specify that no one under the age of 16 may be employed to operate power machinery. (Refer to U.S. Department of Labor, Employment Standards Administration, Wage and Hour Division, Child Labor Bulletin #102).

In employment conditions, current OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be, involved."

Observe the accident prevention rules as well as other safety regulations and local traffic rules at all times. The manufacturer is not liable for any damage to the machine or personal injury resulting from any unauthorized refitting of this machine or use of the tractor for tasks that are outside the scope of the tractors usage guidelines.

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Safety Precautions

1. Safety Precautions

1.1 Safety Rules and Notices of Use

Reading Prior to Use

1. The instructions for use, maintenance, and the safety warning identifiers should be fully read and understood.
2. The correct usage and operating method should be observed.
3. Local traffic rules and safety regulations must be observed at all times.

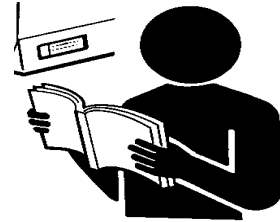


Fig. 1-1 Reading prior to use

A Qualified Operator

1. When operating the machine, the driver must use sound judgment.
2. Never operate the tractor if you have been drinking or are tired.
3. The driver should read and understand this operator's manual.
4. Drive slowly at first in order to test your skill level.

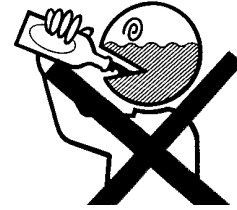


Fig.1-2 A qualified operator

Clothing

During the operation, the driver should avoid loose fitting clothing. Baggy and bulky clothes are not recommended.



Fig.1-3 Driver's clothes

Fuel Usage

1. Diesel fuel is a combustible substance. Keep all fuel away from open flames.
2. The engine should be shut down prior to refueling.
3. Smoking is strictly prohibited when the fuel system is being refueled and overhauled.
4. Use a clean rag to wipe off any fuel or machine oil overflow.
5. The requirements set out in the "Appendix" must be strictly complied with for fuel and lubricating oil quality assurance.



Fig.1-4 Use of fuel

Safety Precautions

Waste Oil Disposal

1. Used machine oil is a hazardous waste. Dispose of it properly.
2. The used acid from the battery is also a hazardous waste. Dispose of it properly.



Fig.1-5 Waste oil disposal

Hydraulic Line Leaks

Do not use your hand to check for leaks in the high-pressure hydraulic oil lines. You may use a piece of cardboard or a wooden board to test for possible leaks.

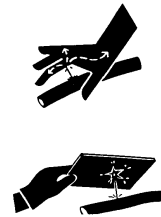


Fig. 1-6 Hydraulic line leaks

Removing the Radiator Cap

Never remove the radiator cap when the engine is hot. Turn the engine off and wait until the engine has cooled, then turn the cap to the first position. Once pressure has been reduced, you can then remove the cap.

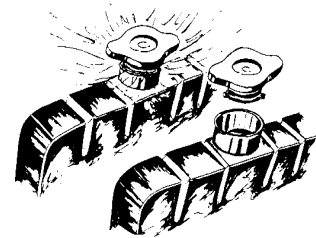


Fig. 1-7 Removing the radiator cap

Electric Parts Maintenance

1. Remove the ignition switch key.
2. Never service any of the tractor's electrical components without first removing the ground wire from the battery.

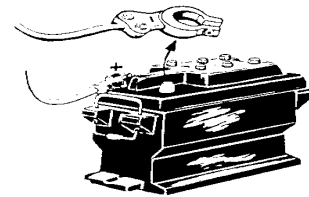


Fig. 1-8 Electric parts maintenance

In Case of Defects or Abnormal Operation

1. The tractor should not be operated "in spite of defects." In case of a lack of oil pressure, excessively low oil pressure, an overly high water temperature or unusual sounds and smells, stop the tractor and troubleshoot the problem.
2. During lubrication maintenance and for any on-field adjustment, the engine should be shut down.

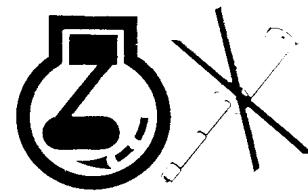


Fig. 1-9 In case of defects or abnormal operation

Safety Precautions

Emergency Procedures

1. In case of a brake failure, hold the steering wheel firmly, wait until the tractor has come to a complete stop and then shut down the engine.
2. If the steering malfunctions, brake immediately and shut down the engine.
3. If a fire should occur, immediately shut down the engine and get off the tractor. If a fire extinguisher is available, put out the flames at the source of the flame. If a fire extinguisher is not available, use sand or other non-flammable substance to fight the fire.
4. After any safety incident, immediately dial any necessary emergency services (hospital, fire department) according to the situation and administer first-aid as necessary.



WARNING:

1. Always operate the tractor in a safe and responsible manner to avoid injury and possible death.
2. Pay special attention to any obstacles that may impede progress or cause an accident before starting the tractor. Also check for obstacles and impediments that may be covered by the tractor, an implement or a trailer.
3. Never leave the driver's seat to start and operate the tractor. Prior to the startup, make sure that various shift levers are in the neutral position, the throttle lever and the front drive control handle are disengaged, and the lifter operating handle is in neutral to prevent the sudden start up of accessories.
4. Do not start the engine by bridging-over the starter solenoid. If you do this, the tractor could lose control and cause a dangerous situation, which could lead to injury or death.
5. Make sure that the pedals are free from obstacles and able to move unhindered to their home position. Never keep anything on the floor or around the pedals that could hinder pedal travel. An extra foot blanket or non-standard floor mats should not be used as they can hinder pedal movement and cause serious injury or damage.
6. Never get on or off the tractor while it is in motion.
7. Never climb under the tractor while the engine is running.
8. Always remove the keys, set all shift levels to neutral and lock the auxiliary brake handle before exiting the cab to avoid accidental start up and to keep the tractor from moving unattended.
9. Keep your speed under control at all times. Brake prior to turning in order to maintain your load

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and avoid tipping.

10. When crossing or going under a bridge or going through a tunnel, pay full attention to the load height.
11. Use the lowest gear with the clutch enabled on a down slope. Never put the tractor in neutral and coast downhill as this can cause instability. Never change gears on a down slope as this can cause instability and a possible rollover.
12. Avoid sudden turns at high speed or using unilateral braking to turn as this can result in instability.
13. When driving on roads, obey all local traffic indicators and laws.
14. Keep a safe distance between the tractor and any other vehicles that may be on the road.
15. Roadbeds along the ditch line tend to be more fragile. Pay specific attention to the weight of your vehicle when riding on the road shoulder.
16. Never overload the tractor. Running the tractor over the specified limits can cause damage to the tractor and can result in injury.
17. When driving at night, make sure that you have proper lighting to avoid any collisions.
18. When working in tall grass or hay, a spark-extinguishing device must be affixed to the exhaust pipe to avoid accidental fires.
19. Always slow down when working in wet or rainy conditions to avoid slippage and instability.
20. Always operate the tractor at a safe speed.
21. When attaching implements, make sure all 3-Point hitch pins are securely fastened. When disconnecting implements assure all 3-Point hitch pins are disconnected.
22. When lifting, reduce engine speed to avoid damage to tractor and personal injury.
23. Upon charging the battery, insure proper ventilation.
24. Beware of overhead high voltage transmission lines!



Caution:

1. Check nuts, bolts, and other loose components regularly and tighten as required. This could prevent a potentially dangerous situation.
2. When the tractor runs the power take-off (PTO), make sure that there is a safety shield installed.

Safety Precautions

Never approach the PTO shaft when it is running. Never take sudden turns when the PTO shaft is under load, as this can damage the universal joint or the PTO shaft. When the PTO shaft is not in use, the PTO lever should be returned to the neutral position.

3. After parking and before shutting down the tractor, the driver should remove the key from the ignition, set all gearshift levers to the neutral position, and lock the brake handle. This will prevent the tractor from accidental startup and unattended movement.
4. When parking the tractor on an incline, the auxiliary brake should be engaged and the engine shut down. Put the tractor in gear, apply the auxiliary brake and use the triangle chocks to block the rear wheels.
5. Tire installation and adjustment should be done by trained personnel only, using special tools. Faulty tire installation may cause a serious accident or damage.
6. When cleaning the radiator, shut down the tractor and allow the tank to cool for 30 minutes.
7. Pay attention to all safety precautions when replacing or installing new parts on your tractor.

IMPORTANT ISSUES:

1. Always operate the tractor according to the specified break-in requirements. This will prolong the life of your tractor.
2. Prior to starting the tractor, the oil system, cooling system and electric circuits must be examined. After startup, strict attention should be paid to the various instruments.
3. Before activating the power take-off (PTO) shaft, make sure that the equipment is properly inspected. When using PTO driven implements, the angle between the PTO shaft and the universal joint drive shaft should be no more than a 15° angle; and the hydraulic operating control should be in neutral. After the farm tool has been lifted, the included angle between the PTO shaft and the universal joint drive shaft should be at no more than a 20° angle. Never use the implement without checking for a proper connection with the PTO. This can cause damage to the implement and severe damage to the tractor clutch and power train. To increase work efficiency, the power supply should never be shut off during a turn, and the lifting

Safety Precautions

height must be maintained at 200 mm. (7.88 in.) above the ground.

4. Hanging farm implements can shift tractor weight. They should be low to the ground before exiting the tractor.
5. Antifreeze should always be used in the engine cooling system.
6. The front driving axle of tractor should only be engaged in agricultural instances and when roads are muddy. Overuse of the front drive axle may result in premature wear of the tires and transmission problems.
7. Only use parts recommended by the manufacturer to replace worn or broken components.
8. Never rest your foot on the brake or clutch pedal when the tractor is in motion as this can cause premature wear of the brakes and clutch system.
9. When detaching the tractor from any implements, the upper lever of the suspension unit should be adjusted to the shortest travel and the limit lever adjusted to prevent the implements from swinging out of control. The locking nuts on the upper and limit levers must be tightened in order to guarantee travel safety and to avoid damage to the tractor and the machinery.

1.2 Safety Warning Symbols



Caution:

1. All safety identifiers should be visible and easy to read. When dirty, wash with soapy water and wipe them with a soft rag.
2. When the safety identifiers are lost or damaged, contact the dealer or the manufacturer for replacement stickers.
3. When replacing parts with attached safety warning symbols, the safety identifiers that correspond to that specific part need to be updated as well.
4. To prevent injury, accidents and damage, always comply with safety warning identifiers.

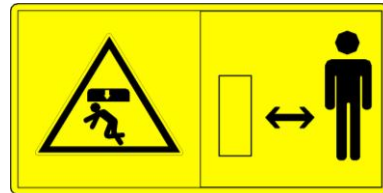
Safety Precautions



During machine operation, keep a safe distance from the hot surface of the machine, as it can cause serious burns.

Location: outer side of damper, water tank flank.

Fig. 1-10 Safety warning identifier



Please keep a safe distance from the tractor when it's operating, to avoid any personal injuries.

Location: left from the rear side of mudguard.

Fig. 1-11 Safety warning identifier



Never sit on the fender when the tractor is operating as this could result in falling from the vehicle and possible injury.

Location: front side of the mudguard.

Fig. 1-12 Safety warning identifier



To avoid injury, stay a safe distance from the lifting lever when the lifting lever control system is in operation.

Location: right rear side of the mudguard.

Fig. 1-13 Safety warning identifier



Always shut down the engine and remove the key prior to maintenance and adjustment.

Location: in front of the instrument panel.

Fig. 1-14 Safety warning identifier

Safety Precautions



Do not open or dismantle the safety hood and keep your hands away from the engine when it is running.

Location: on the engine hood.

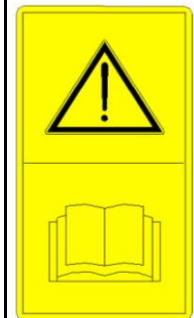
Fig. 1-15 Safety warning identifier



Always start the engine from a secure position in the driver's seat.

Location: in front of the instrument panel.

Fig. 1-16 Safety startup symbol



Read and understand all instruction for use, including the meaning of all non-lettered safety symbols.

Location: in front of the instrument panel.

Fig. 1-17 Read the instruction identifiers

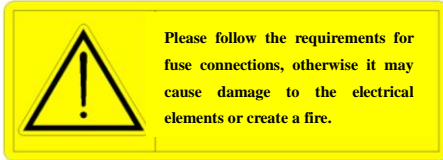


Never touch moving parts when the tractor is in motion.

Location: on the PTO shield.

Fig. 1-18 PTO safety identifiers

Safety Precautions



Please follow the requirements for fuse connections, otherwise this may cause damage to the electric components or start a fire.

Location: near the electric fuse box.

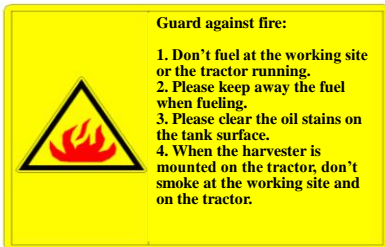
Fig. 1-19 Fuse safety warning symbol



For battery service, carefully read the instructions in order to understand the correct maintenance procedures.

Location: on the surface of the battery.

Fig. 1-20 Battery symbol



To prevent the risk of fire, never refuel the tractor while it is running. Clean Grease, fuel, and oil spills immediately.

Location: near the fuel tank.

Fig. 1-21 Refueling fire protection identifiers



To prevent personal injury, please install the safety shield on the PTO shaft when it is not in use.

Location: on the pneumatic brake cylinder.

Fig. 1-22 PTO safety identifiers

Preventing Farm Machine Hazards

The following article describes important general safety precautions for machinery such as the NT-204C/NT-254 tractor. It is reprinted here with permission from Professor Thomas L. Bean, Safety Leader and Professor, Department of Food, Agricultural, and Biological Engineering, The Ohio State University Extension, The Ohio State University.

AEX-593-91

Thomas L. Bean

Each year, 2,600 farm residents are killed and 230,000 disabled in farm-related injuries, many due to farm machinery. Farm machinery uses mechanical power to do work. This creates a number of possible hazards for both operators and bystanders. Even though manufacturers take many steps to make machinery safe, all hazards cannot be removed. Some machine parts cannot be completely shielded and still do their job. For instance, a totally enclosed cutting blade could not cut.

Many machinery-related accidents result from human error. The operator either forgot something, took a shortcut or a risk, ignored a warning, wasn't paying close attention, or failed to follow safety rules. In addition, guards removed for maintenance often aren't replaced.

There are many different kinds of farm machinery: mowers, tractors, shredders, harvesters, grinders, blowers, augers, balers, etc. They all have similar characteristics and hazards. You can be cut, crushed, pulled in or struck by an object thrown by these machines. They have cutting edges, gears, chains, revolving shafts, rotating blades, pinch points and other hazards. You can also be injured if you fall while working on or near any of these machines.

Accidents with farm machinery are often serious, even fatal. It is important to recognize and be alert for machine hazards and to take precautions to avoid injury.

Shear and Cutting Points

Shear points (Fig. 1 below) are created when the edges of two objects are moved together closely enough to cut a soft material, as with a pair of shears or an auger. Cutting points are created when a single object moves forcefully or rapidly enough to cut, as with a rotary mower blade.

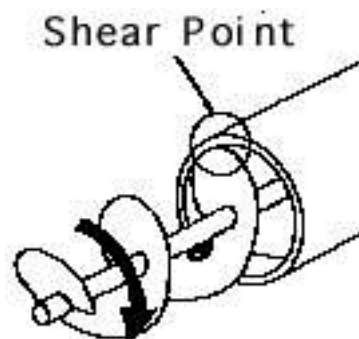


Figure 1

Safety Precautions

Both shear and cutting points are created on machinery designed to cut, such as harvesters, and on those that are not designed to cut, such as augers. They are hazardous because of their cutting force and they often move so rapidly that they may not be visible, so it is easy to forget they are operating or to underestimate the hazard.

Because some shear and cutting points cannot be guarded, it is important to be aware of their hazard and stay alert when they are operating. It is also important to warn others and to look out for their safety. This is especially true if there is a danger of thrown objects while using cutting-type equipment.

Pinch Points

Pinch points are another hazard of farm machinery (Fig. 2 below). Pinch points (which should be more appropriately named mangled or maimed points) are formed when two rotating objects move together and at least one of them moves in a circle. For example, the point at which a belt runs into a pulley is a pinch point. Belt drives, chain drives, and gear drives are other sources of pinch points in power transmission devices. Feed rolls, gathering chains and similar equipment designed to draw crops into the machine also create pinch points.

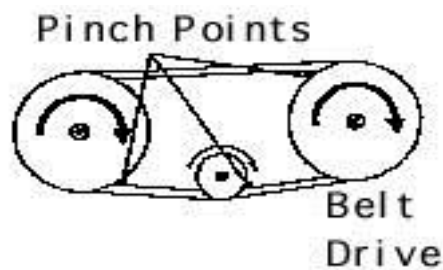


Figure 2

Fingers, hands and feet can be caught directly in pinch points, or they may be drawn into the pinch points by the inertia of the moving part or loose clothing that becomes entangled. Contact may be made by falling or brushing against unshielded parts. You can become entangled in pinch points if you take chances and reach or work near rotating parts. Machines move too fast to get out of a pinch point once you become caught.

To avoid injury from pinch points, be aware where pinch points occur and avoid them. Wear clothing that fits well and is not loose or floppy. Never reach over or work near rotating parts. Turn off machinery to work on it. Always replace shields removed for maintenance.

Wrap Points

Rotating shafts are the most common source of wrap-point accidents, although any exposed machine part that rotates can be a wrap point. A cuff, sleeve, pant leg, long hair or just a thread can catch a rotating part and result in serious injury. Entanglement with a wrap point can pull you into the machine, or clothing may become so tightly wrapped that you are crushed or suffocated. In other cases, you could be thrown off balance and fall into other machinery parts.

Even a perfectly round shaft can be hazardous if there is enough pressure to hold clothing against the shaft.

Safety Precautions

Hazards increase with shafts that are not round. Clothing is more likely to catch if there is dried mud or manure on the shaft, or if the shaft is nicked. Ends of shafts that protrude beyond bearings are also dangerous. Universal joints, keys and fastening devices can also snag clothing.

Check all equipment for potential wrap points and, if possible, shield those that can be shielded. Replace any damaged manufacturer-installed warning labels and place warnings on equipment parts not previously labeled. In addition, consider painting them a bright color, perhaps with wide stripes. Be aware of wrap points and be alert to their danger.

Crush Points

Crush points are created when two objects move toward each other or one object moves toward a stationary object. For example, hitching tractors to implements (Fig. 3 below) creates a potential crush point.

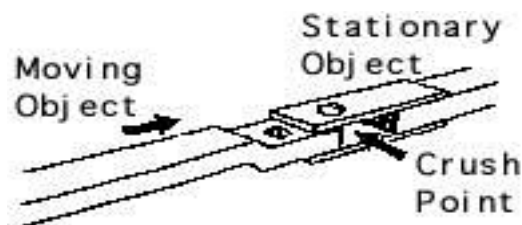


Figure 3

Hitch accidents most commonly occur to fingers placed at the hitching point. Wait until the tractor has stopped before stepping into the hitching position. If possible, arrange the hitch point so that the tractor can be backed into position without anyone between. Always know what the other person is doing.

Failure to safely block up equipment can result in a fatal crushing injury. A jack may slip, a hose or overhead support may break, or the equipment may roll. Take extra precautions when working with machinery that is raised for any reason. The operator's head or chest can be crushed between the equipment and a low beam or other part of a farm building. These accidents usually occur when the machine is being operated in reverse. Tree limbs are also potential hazards when working with tractors and other machinery.

To prevent being crushed or pinned, recognize and avoid potentially dangerous situations. Block all machinery securely if you must work under it. If an implement can roll freely, block its wheels so it cannot roll.

Free-Wheeling Parts

Many machine parts continue to spin after the power is shut off, including cutter heads of forage harvesters, hammer mills of feed grinders, rotary mower blades, fans and flywheels. Never touch these parts until they have stopped moving. This could take 2 – 2 1/2 minutes.

Safety Precautions

Springs

Compressed springs (Fig. 4 below) will expand with great force when released, and springs that are stretched will contract rapidly when released. Know what direction a spring will move and how it might affect another machine part when released, and stay out of its path.

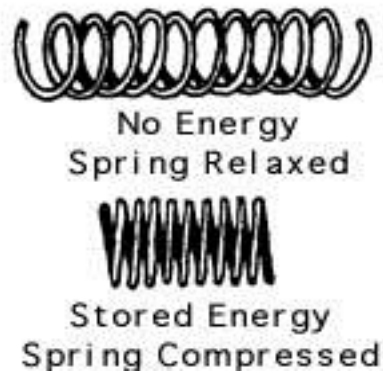


Figure 4

Burn Points

Be aware of burn points: mufflers, manifolds and even gear cases under adverse climatic conditions. They may not be severe enough to seriously maim, but they can startle the operator enough to cause him or her to “jump” into more deadly danger.

Hydraulic Systems

Hydraulic systems contain fluid under extreme pressure. Before loosening, tightening, removing or otherwise working with any fittings or parts, relieve this pressure. Jet streams from even pinhole leaks can penetrate flesh. In addition, the liquid is often hot.


Before attempting any service on hydraulic systems, shut off the engine that powers the hydraulic pump. Lower the implement to the ground and relieve the pressure. Follow instructions in the operator’s manual because the specific procedures for servicing the systems are very important to your safety.

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Reviewed by Dr. Randall Wood and Dr. Warren Roller.


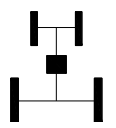

















Operation Instruction

2. Operation Instruction

 **NOTE:** Operating the tractor properly can maximize efficiency, reduce tractor wear, and prevent accidents. It can enable the operator to complete farm and road operations fast, efficiently, and safely with low fuel consumption.

2.1 Commonly Used Identifiers

Table 2-1 Common Symbols

Symbols	Definition	Symbols	Definition	Symbols	Definition
	Safety warning identifier		Four-wheel drive		Horn
	High beam		Low beam		Quick
	Engine oil pressure		Charging and discharging indication		Slowly
	Turn signal indicator		Windshield washer		Position lights
	Engine preheat		Rear windscreen wiper		Wiper
	Air filter blockage warning		Hydraulic oil air separator		Pneumatic braking invalid/failure
	Engine coolant temperature		Quantity of fuel		Parking brake
	Differential lock		Warning light		Warning lamp

Operation Instruction

2.2 Product Description

The Operation Instruction section introduces all application, technical maintenance, adjustment, failure and troubleshooting procedures for the NorTrac 82XTC series wheeled tractors:

NorTrac 82XTC wheeled tractors are a type of multifunctional large wheeled tractors used for farming. The tractors have a compact structure, are easy to control, offer flexible steering and a high lifting capacity, and are easy to maintain.

2.3 Tractor Operating Mechanisms and Instrumentation

2.3.1 Tractor Operating Mechanisms

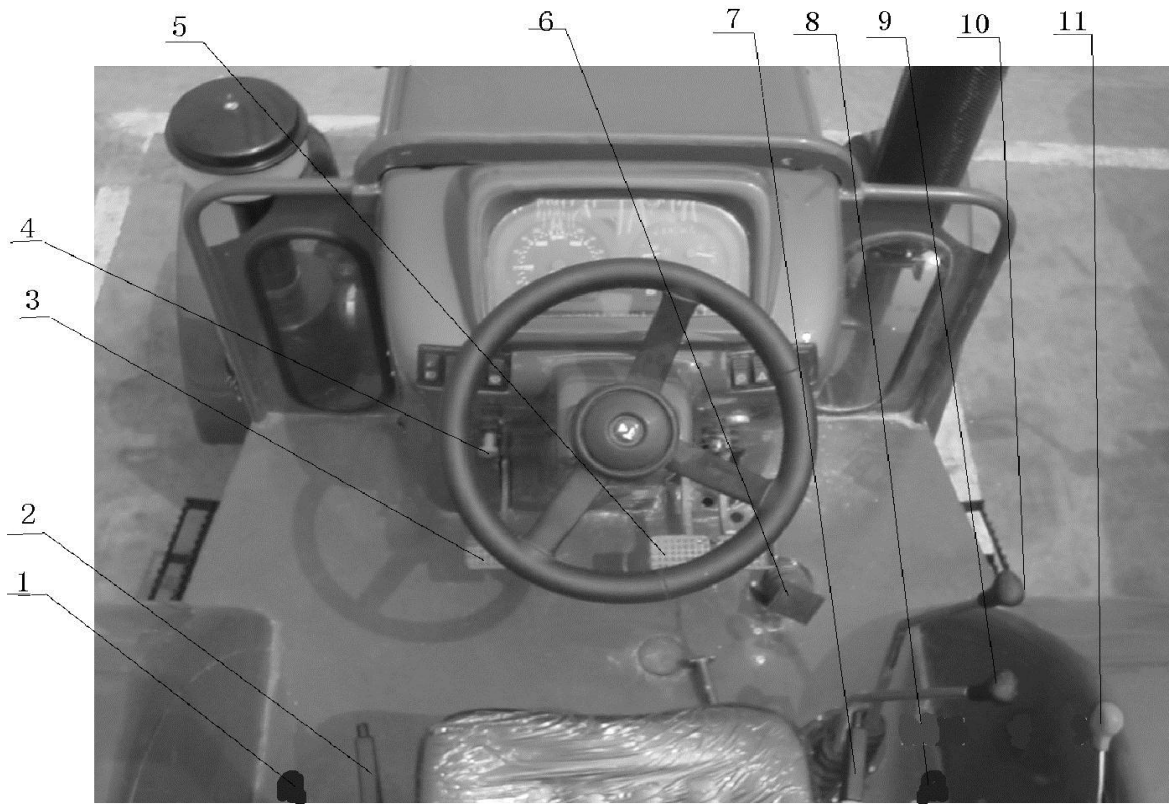


Figure 2-1 Tractor Control Mechanisms

1. Power take-off control handle 2. Parking brake control handle 3. Main clutch pedal
4. Fuel shutoff cable handle 5. Left/right braking pedal 6. Foot throttle control pedal
7. Auxiliary clutch control handle 8. Distributor control handle 9. Main gear shift lever
10. Auxiliary gear shift lever 11. Hand throttle control handle
- Not shown: 12. Shift pedal 2/4-wheel drive (left floor) 13. Differential lock
14. T handle high./low range shift lever (both on right floor)

Operation Instruction

2.3.2 Instrumentation and Switches

Instrumentation and Switches

The combination instrumentation is composed of a water temperature gauge, a fuel gauge, an engine tachometer, a turn light indicator lamp, a high/low beam indicator lamp, a position indicator lamp, a charge indicator lamp, an engine oil pressure indicator lamp. These help monitor the working condition of the tractor at all times.



Figure 2-2 Instrumentation and Switches

1. Combination instrument assembly
2. Right rocker switch combination
3. Ignition lock
4. Left rocker switch combination

IMPORTANT NOTE: When operating the tractor, the driver should observe the various instruments and indicator lights. If anything abnormal occurs, you should stop the tractor and troubleshoot the problem.

Engine Tachometer

After the, the tachometer shows the rotary speed of the engine. There is engine is started also a box which reflects the operating hours of the engine.

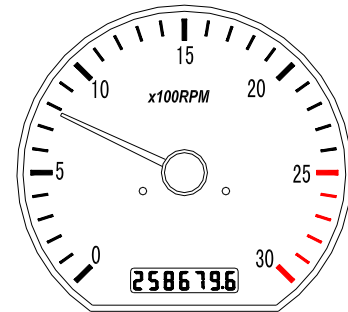


Figure 2-3 Engine Tachometer

Water Temperature Gauge

The engine cooling liquid temperature is marked with an indicator needle that goes from left to right; the red area denoting a high temperature.

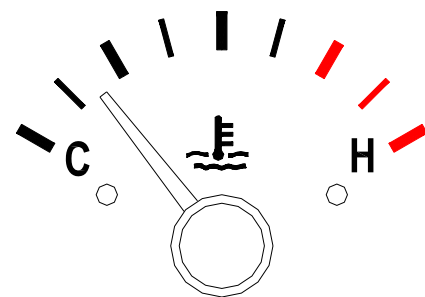


Figure 2-4 Water Temperature

Operation Instruction

Oil Pressure Gauge

The oil pressure gauge indicates the oil pressure in the engine in Mpa.

Direction of the pointer:

Increasing oil pressure is indicated as the pointer moves to the right.



Figure 2.5 Oil Pressure Gauge

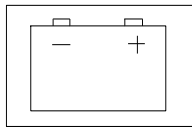
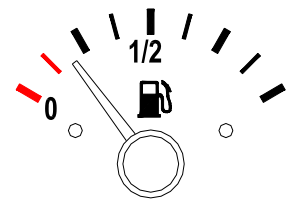
Fuel Gauge

The fuel gauge indicates the level of diesel fuel in the fuel tank.

Direction of the pointer:

Rightmost position: Indicates that fuel tank is filled. Leftmost position:

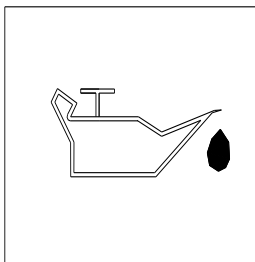
Indicates that there is not enough fuel in the tank and it should be filled immediately. Figure 2-6 Fuel Gauge



Charging Indicator (Red)

After the engine is started, the charge indicator goes out, which means the battery is charged normally. Check and repair if the indicator does not go out.

Figure 2-7 Charging Indicator Lamp



Engine Oil Pressure Warning Lamp (Red)

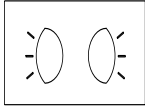
When the key is turned to the ignition position, the lamp is lit. After the engine has started, the lamp will go out. This means that the oil lube system pressure is normal.

When the engine is at idle, the light may be illuminating. This is normal; the pressure in the lubrication system is low during the idling period. If the lamp is light when the engine is run at normal rpm, the tractor should be shut down and you should troubleshoot the problem.

Figure 2-8 Engine Oil Pressure Warning Lamp

IMPORTANT NOTE: The key should be switched to the ignition position before starting the engine. Check if the above three lights are illuminating. If they are not illuminating, the bulbs could be damaged or the circuit faulty. Overhaul immediately.

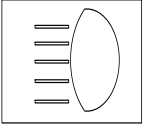
Operation Instruction



Position Indicator (Green)

When the tractor is run on the road at night and it needs to be parked, in order to ensure your safety and warn other drivers, the position indicator lamps should be turned on. Switch the position indicator to the “1” position (figure 2-21) and the indicator will be illuminated.

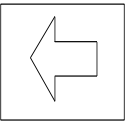
Figure 2-9 Position Indicator Lamp



Front Light High Beam Indicator (Blue)

When the light switch is in the “2” position (figure 2-16) and the dimmer switch is in the 2 position (figure 2-15), this control panel light is illuminated, indicating that the head light is on high beam.

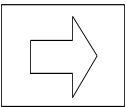
Figure 2-10 Head Light High Beam Indicator Lamp



Left-Turn Indicator (Green)

When the tractor is turning left and the left turn signal is on, the left indicator light should be illuminated and blinking.

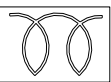
Figure 2-11 Left-Turn Indicator Lamp



Right-Turn Indicator (Green)

When the tractor is turning right and the right turn signal is on, the right indicator should be illuminated and blinking.

Figure 2-12 Right-Turn Indicator Lamp



Preheater Indicator (Yellow)

When the tractor is preheating, the preheater indicator lamp is illuminated.

Figure 2-13 Preheater Indicator Lamp

Left Rocker Switch Combination

1. Dimmer switch.
2. Light switch.
3. Roof/rear light switches.
4. Front windshield wiper switch.

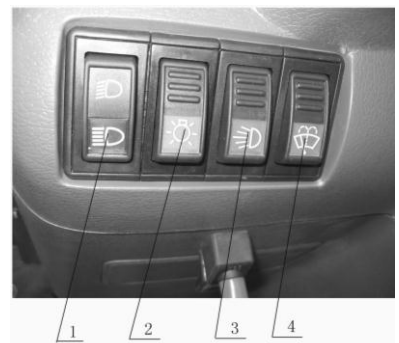
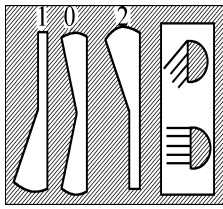


Figure 2-14 Left Rocker Switch Combination

Operation Instruction



Headlight Dimmer Switch

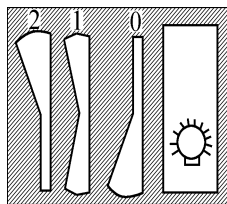
“1” Position: Headlights are on low beam.

“0” Position: Spare.

“2” Position: Headlights are on high beam when headlight switch is in “2” Position

This switch works with the headlight/taillight switch. The headlights must be turned on before they can be set to high beam.

Figure 2-15 High/Low Beam Switch



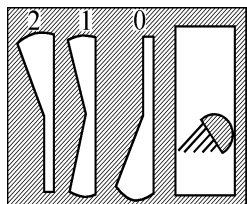
Headlight/Taillight Switch

“2” Position: Turns on high beam headlights if dimmer switch is set to “2” Position.

“1” Position: Turns on taillights and low beam headlights.

“0” Position: Turns off headlights and taillights.

Figure 2-16 Headlight/Taillight Switch



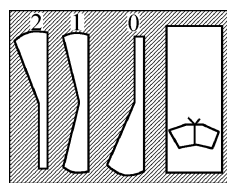
Upper and Lower Work Lights Switch

“2” Position: Upper front and rear and lower rear work lights are on.

“1” Position: Upper front and rear work lights on (if there is a cab).

“0” Position: Lights off.

Figure 2-17 Upper and Lower Work Lights Switch



Front Windshield Wiper Switch

“2” Position: High speed wipers.

“1” Position: Low speed wipers.

“0” Position: Wipers off.

Figure 2-18 Front Windshield Wiper Switch

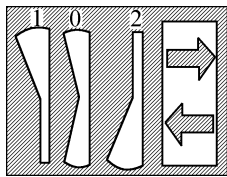
Operation Instruction

Right Rocker Switch Combination

1. Rear window wiper switch.
2. Warning flashers switch.
3. Turn signal switch.



2-19 Right Rocker Switch Combination



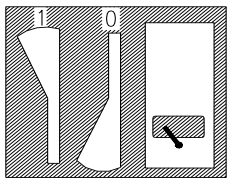
Turn Signal Switch

“1” Position: Left turn signal on.

“0” Position: Power supply off.

“2” Position: Right turn signal on.

Figure 2-22 Steering Switch



Rear Windshield Wiper Switch (with optional cab)

“1” position: Turns on the rear wiper.

“0” position: Turns off the rear wiper.

Figure 2-23 Rear Wiper Switch

Horn Button

The horn button is located at the center of the steering wheel. Sound the horn by pressing down on the horn button.

Operation Instruction

Ignition Switch

Put the key into the ignition switch and turn it clockwise to the following positions:

- Turn the key to ACC to start the accessory electrical components, such as the heater, the wipers, fan, etc.
- Turn the key to the ON to power on the ignition and the electrical system.
- Turn the key to H to start the preheater plug (or preheating system).
- Turn the key to ST to start the engine. After the engine starts, release it immediately. The starter disengages upon release and the key returns to the “ON” position automatically. At this point, the ON and the AAC components are still switched on, and the power supply for the entire tractor remains on.

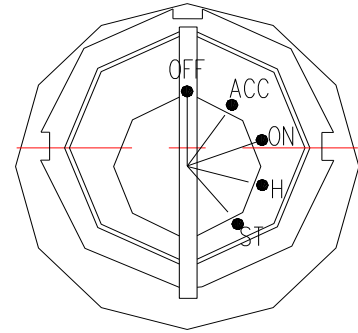


Figure 2-24. Ignition Switch

2.4 Starting the Engine

IMPORTANT ISSUES:

1. Before starting the tractor, inspect it for damage or loose parts that could cause an accident.
2. Check the radiator regularly and make sure that you have a clean water/antifreeze mix to avoid overheating of the engine.

2.4.1 Engine Starting Preparation

1. Before starting the engine, check to make sure that there are no loose parts, that each operating mechanism is functioning normally, that each hose or tube connection is tight and that there is no oil, fuel, or water leakage.
2. Check the engine oil pan, transmission, rear axle and the hydraulic system to make sure that their lube oil levels are sufficient.



Figure 2-25. Hand Throttle Position

The radiator should be full of cooling water and antifreeze and the fuel tank should have fuel.

3. Check the transmission shifters and the power takeoff (PTO) shaft control handle. Make sure that the main shift lever, the high/low gear shift lever, and the front drive axle control handle are set in the neutral position. The 3-point lift lever should be set in the lowering position.
4. Place the hand throttle half-open, as shown in Figure 2-25.

Operation Instruction

5. For a new tractor, or one that hasn't been used for a long time, an overhauled should be performed before starting. Before starting, bleed the air from the fuel line to ensure that diesel engine starts smoothly. The procedure is as follows: first loosen the bleed screw on the diesel filter and discharge the air in the hose from the fuel tank to the diesel filter with a hand pump until there are no bubbles in the discharged fuel. Then tighten this screw and loosen the bleed screw on the fuel pump to discharge the air until there are no air bubbles in the fuel flowing out of the fuel pump. Then tighten this bleed screw.

IMPORTANT NOTES:

1. Clean debris off the radiator regularly to avoid engine overheating.
2. If the tractor is equipped with a combine, heat buildup during operation will become a problem. To make sure that the engine performs properly, an auxiliary radiator needs to be installed on the tractor.

2.4.2 Engine Start



WARNING: Before starting the engine, make sure that the main gear shift lever, the high/low shift lever, the shuttle gear shift lever, and the front drive control lever are in the neutral position, and the 3-point lift control lever is in the lowering position. This will prevent the tractor from accidentally starting and causing an accident or injury.

IMPORTANT ISSUES:

1. Never turn the key for more than 5 seconds. If the engine does not start within 5 seconds, let the starter rest for 15 seconds and try again. You can do this three times. If the engine still doesn't start, you need to trouble shoot the problem to prevent damage to engine components.
2. Once the engine is started, ease up on the throttle immediately. Check the engine oil pressure at this time to ensure that the oil level is no lower than 9kPa (1.31 psi). The oil pressure indicator light should turn off at this time.
3. Do not attempt to run at full-load immediately. It is necessary to run the engine at medium speed to warm it up. When coolant temperature is above 60°C (140°F), you can then increase the speed and operate the tractor with a full load.
4. The engine rpm and load should be varied between low and high speed, especially for a new engine. Do not attempt to run the tractor at high speed using the fuel throttle lever or the accelerator foot pedal.

Operation Instruction

- When running the engine, the oil pressure and coolant temperature should be checked regularly. During the normal operations of the engine, the cooling temperature should be around 85°C (185°F) and the engine oil pressure should be 310 to 345 kPa. (45-50 psi).

Starting the Engine in Ambient Temperatures (above 40°F):

When the temperature is above freezing, insert the key and turn it clockwise. Turn to ignition to the ON position to switch on the tractor electrical system. Step on the clutch pedal and then turn the key clockwise to ST to start the engine. After the engine is started, release the key immediately. It will automatically return to the ON position

NOTE: Amp meter should drop to -30.

Starting the Engine in Low Temperatures (below 40°F):

When starting the tractor in low temperatures (below 23°F), use the engine preheater. Put the fuel throttle lever in the one-quarter throttle position, turn the key clockwise to H position and leave it on H for 15–20 seconds. Turn the key to the ST position to engage the starter. Release it immediately after starting and the key will automatically return to the ON position.

When working in a cold climate, consider having an engine coolant heater permanently installed in the engine to make cold weather starting easier.

Plug in the engine heater when the tractor is not in use.

NOTE: Amp meter should drop to -30.

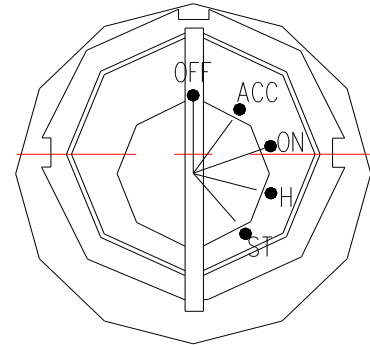


Figure 2-26 Ignition Switch

**Do Not Use
Ether or Starting
Fluid for Starting
Your Dozer
or
Tractor**

Operation Instruction

2.5 Running the Engine

1. After the engine is started, ease up on the throttle immediately to allow the engine run at idle. Check the engine oil pressure to ensure that the indicator on the oil pressure gauge is in the green zone.
2. After the engine is started, do not run a full-load immediately. The engine should be run at idle to medium speed to heat the engine. When the coolant temperature rises above 140°F, you can then increase to high speed and operate at full load capacity.
3. The engine rpm and load should be slowly increased or decreased, especially for a recently started engine. Never use the hand throttle to run at high speed.
4. When the tractor is running the engine oil pressure and coolant temperature should be checked regularly. During normal operations of the engine, the indicator on the oil pressure gauge and water thermometer should be in the green zone.
5. When running the engine, the oil pressure and coolant temperature should be checked regularly. During the normal operations of the engine, the cooling temperature should be around 85°C (185°F) and the engine oil pressure should be 310 to 345kPa. (45-50 psi).

IMPORTANT ISSUES:

In order to avoid damage to the engine, never let the oil pressure fall below 9kPa (1.31psi). If the oil pressure is dangerously low, shut down the engine and troubleshoot the problem immediately.

2.6 Putting the Tractor in Motion

1. Set the shuttle gear shift to Forward or Reverse.
2. Set the range gear shift into the Low range.
3. With the engine running at low speed, step on the clutch pedal. Then, put the gear shift level in the desired speed. To prevent gear tooth breakage in the transmission or early clutch damage, do not start the engine in the High gear range.
4. Release the parking brake.
5. Gradually increase the engine speed and slowly release the clutch pedal until the clutch engages, then fully release the clutch to get the tractor running properly. Gradually accelerate to the required operating speed.

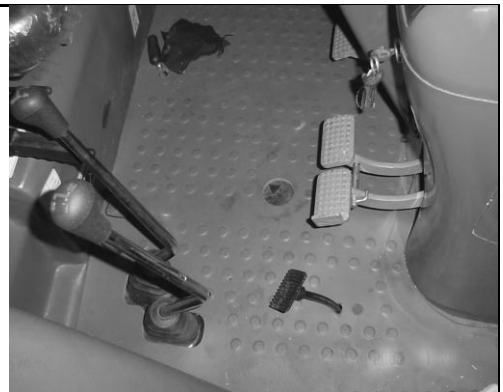


Figure 2-26 Tractor Start

Operation Instruction

6. Always step on the clutch when changing gears to prevent damage to the transmission.
7. When driving the tractor on the road, make sure you use the turn signals to signal your direction and the horn to warn others. Lower your speed before making a turn and make the turn slow and early. If the turn is extremely sharp, slow your speed and take a wider angle.
8. When turning the tractor on a tight angle or on soft soil, steering becomes more difficult due to front wheel side slip. To make the turn easier, step on brake pedal on corresponding side while making the turn.



WARNING:

1. When running the tractor at high speed, never use just one-side brake for sharp turns. Use both brake pedals. If you hear an abnormal noise when steering, stop operation and adjust so that you do not cause damage to the hydraulic steering system due to an overload.
2. When operating in the field, prior to turning or backing up, the parts and components of a towed implement need to be lifted clear of the soil to prevent equipment damage or injury.

2.7 Steering the Tractor

When driving the tractor on the road, press the turn signal switch on the control console to light the turn indicator, and then make the turn. If your speed is too high, slow down before making the turn and start the turn early. If you have to make a large turn, make the turn at a slow speed.

When turning the tractor tightly or on spongy-soft ground, you may experience some sideslip on the front wheel. When this happens, step on the corresponding brake pedal and rotate the wheel to make the turn.



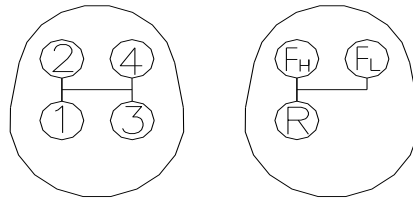
WARNING:

1. Never make sharp turns when the tractor is moving at a high speed, as this may cause the tractor to become unstable.
2. Before making turns or backing up during field work, lift any implements from the soil to avoid damage.

2.8 Shifting Gears

16+8 Shuttle-Type Gear Shift

There are three gear shifts. The main and shuttle gear shifts are controlled by two shift levers on the driver's right. A T-handle on the right side floor controls the high and low range. The main gear shift lever A accounts for 4 shifts (1 through 4), and the shuttle gear shift lever B has 2 forward speeds (F_H for Forward High and F_L for Forward Low) and one reverse (R). The floor T-handle controls the High and Low range selection (H and L). It works with all four gear selections, in forward and reverse.



Main Gear Shift Lever A Shuttle Gear Shift Lever B

Figure 2-28 Tractor Gear Shift

Press the main clutch pedal to the floor and move the shuttle gear shift lever B to the left from NEUTRAL, then push it forward to forward high gear F_H . If you pull it backward, it will be in reverse gear R. Push it to the right from NEUTRAL, then push it forward and it will be forward low gear F_L .

Press the main clutch pedal to the floor and move the main gear shift lever A to the left from NEUTRAL, then pull it backward to Gear 1. Push it forward to Gear 2. Move the main gear shift lever A to the right from NEUTRAL then pull it backward to Gear 3 and push it forward for Gear 4.

With the 16+8 shuttle-type gear shift, there is a high/low speed T-handle on the center-right of the floor. The central position is NEUTRAL. Pulling it up engages the Low range and pushing it down engages the High range. Combined with the above main/auxiliary gear shift lever, you have 16 forward gears and 8 reverse gears.

You should select the operating speed of the tractor based on getting optimum productivity and economy and prolonging the service life of the tractor. When working, try not to overload the tractor. You should always have a power reserve. When working in the field, the selected speed of the tractor should make the engine load 80%. When the tractor does light-duty operations at a low speed, high shift 1 can be used to save fuel oil by throttling down.

Operation Instruction

IMPORTANT ISSUES:

1. When running the engine, step on the main clutch pedal prior to shifting and wait for several seconds before shifting to prevent improper clutch engagement and damage to the transmission.
2. Always step on the clutch pedal when shifting any of the three gear shifts.
3. Reverse cannot be engaged until the tractor is fully stopped as doing so can damage the gears.
4. When the tractor is running, never place your hand on the shift lever. The pressure of your hand can be transmitted to gear shift fork in the transmission, causing the fork to wear.

2.9 Differential Lock Operation

If the tractor should become stuck or should one rear drive wheel slip, you can lock the differential and connect the right and left rear drive axles.

1. Step on main clutch pedal, and shift the high/low shift lever into the forward low (F_L) range.
2. Shift the range shift lever into low (L).
3. Move the throttle control lever to the high speed position.
4. Step on the differential pedal to engage it.
5. Release the clutch pedal smoothly for stable operation.
6. After getting unstuck or stopping the skid, the differential lock will automatically release.

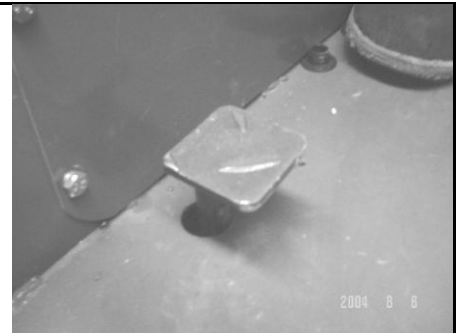


Figure 2-29 Differential Lock Pedal

IMPORTANT ISSUES: When the tractor is running on normal surfaces, never use the differential lock. This will help you avoid damage to components and reduce tire wear.

2.10 How to Use the Front Axle Drive

The NorTrac 82XTC 4-wheel drive tractor can be used for normal operations in the field and on wet and soft soil. If only the rear wheels drive the tractor, the vehicle traction may not be enough for heavy-duty operation. The front axle drive can be used to increase the traction and decrease slipping, improving the tractor's performance. In order to engage and release the front drive axle, use the following operational sequence.

Connecting the Front Axle Drive

Step on the main clutch pedal, engage the tractor in gear, and then release the clutch pedal slowly. After the tractor moves a little, immediately pull the front drive axle control handle backward to change the two-wheel drive into four-wheel drive.

Operation Instruction

Disconnecting the Front Axle Drive

To disengage the front drive axle, push downwards on the front drive axle handle.

IMPORTANT NOTES:

1. Never use the front axle drive on a hard road surface. Doing so will result in early front wheel wear and an increase in oil consumption. Only in rainy or snowy conditions, when the road is slippery or on a steep slope, should the front drive axle be connected. Once clear of the dangerous road surface, the front drive axle should be disengaged.
2. When using the tractor for transportation, the front wheel tires tend to wear rapidly and left/right sides of tire tread patterns wear unevenly. Because of this, you should exchange the left and right tires to maximize their tread life.

2.11 Tractor Braking

2.11.1 Tractor Braking

Start by reducing the throttle, then step on the clutch pedal and then gradually step on the brake pedal to stop the tractor. In an emergency, step on the clutch and brake pedal simultaneously. Never step on the brake pedal without disengaging the clutch, as this will cause sharp wear to the brake pads and kill the engine. When connecting to a trailer brake, adjust the length of the rod of the brake valve so that the trailer brakes before the tractor.

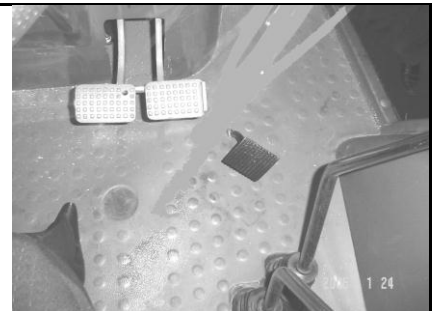


Figure 2-30 Tractor Braking

Interlocking the Left/Right Brake Pedals

When running on a road, lock the left/right brake pedals together with a lock plate.

2.11.2 Left/Right Brake Pedal Interlock



WARNING:

1. Prior to operating the tractor, check the oil level in the brake oil cylinder and the brake pipe for leakage, and troubleshoot if necessary. This will help prevent a potential brake failure.
2. When driving the tractor on the road, the left and right brake pedals must be interlocked to prevent tractor from pulling to one side when braking, and prevent a possible rollover accident.
3. When the tractor is used on the road, lock both the left and right brake pedals together with the lock plate.

Operation Instruction

2.12 Stopping the Tractor and Engine Shutdown Procedures

1. Throttle down to decrease the tractor's running speed.
2. Step on the clutch pedal and then the brake pedal. When the tractor stops, set the shift lever in to the neutral position. The auxiliary shift lever (high/low gear range selector) and the shuttle shift lever (forward and reverse) can be left where they are.
3. Release the clutch and brake pedal, and reduce the throttle so that the engine runs at idle.
4. Pull the fuel shut-off cable knob, which stops the fuel pump from supplying fuel to the engine.
The engine will stop.
5. Turn the starting switch key to the OFF position and shut down all power to the tractor.



NOTES:

1. Never leave the tractor unattended with the engine running as this can result in a dangerous situation.
2. When parking on a slope, the shift lever should be engaged (Shift Forward on uphill and Shift Backward on downhill) to prevent the tractor from accidentally moving.

2.13 Tire Assembly and Disassembly

2.13 Tire Use

- The tires are important parts of the tractor. Attention should be paid to their use and maintenance in order to prolong tire service life.
- All of the tires have specified load values. An overload will deform the tire. The sidewall will bend excessively, and possibly rupture. The fabric of the tire body, as well as the cushion layer, also deforms easily. The fabric layer will become loose until the tire ruptures. This is especially true when the road surface is uneven or impacted by obstacles.
- The inflation pressure of the tires must conform to the specifications. Service life is affected when the tire pressure is too high or too low. If the pressure is too low, the tire will have excessive wear, and service life will be limited. Both inner and outer tires will wear more rapidly when pressure is low. When pressure is low, steering will be adversely affected. If the air pressure on the front tires is too low, steering will be difficult. If tire pressure is too high, the tire body fabric will be stretched excessively and more apt to rupture. The wear on the tire surface will be accelerated. The tractor vibration will be increased. During field operations, the air pressure of the tire should be appropriately lower than when running on

Operation Instruction

the road. Tire pressure is best checked under normal temperatures. Checking a tire when it is hot can result in an incorrect measurement. When driving the tractor, avoid jumping over obstacles at high speed, sudden braking or quick turning. When driving on gravel, spinning the tires should be avoided, when possible.

- During use, the tires should be kept clean of any oil, acid, alkaline chemicals or corrosives. Keep the tires out of bright sunshine and excessive heat as much as possible to prevent the rubber from degrading.
- The front wheel alignment and toe-in should be checked regularly. Failure to do so can result in excessive tire wear. When tire wear is nonuniform, the left and right tires can be switched.

IMPORTANT ISSUES:

The inflation pressure for the front and rear tires on a 4-wheel drive tractor should be the same in order to prevent the tires from being worn.

2.13.2 Tire Removal and Refit

Tire Removal

Special tools are needed to assemble and disassemble a tire. Contact a qualified tire service center to replace tires.



WARNING:

1. When inflating the tire, never remove the lug nuts from the hub. This could cause the tire to fall off and may result in damage to the tractor and serious personal injury.
2. Never disassemble the bolts connecting the tire, the hub and rim in the inflated state. The bolts may become dislodged and cause an accident.

2.14 Counterweights

2.14.1 Rear Counterweights

When the tractor is performing field operations, different counterweights can be used to raise the performance level, according to the conditions. The rear counterweights are made of cast iron, with each piece weighing 40 kg. (88 lb.), and you can apply up to 6 pieces on a single side for 240 kg. (528 lb.) on each side.

- When plowing with a heavy load, you can mount 6 pieces of cast iron for each side (optional).
- For rotary tilling, you can mount 2 pieces of cast iron per side or go without counterweight (optional).
- For common plowing operations, you could mount 4 pieces of cast iron per side.



Figure 2-31 Rear Counterweights



WARNING: Before removing the rear wheel from the tractor, first remove the counterweight from the tire to avoid an accident.

2.14.2 Front Counterweights

In order to adjust the front and rear axle loads of the tractor, it is necessary to mount counterweights on the front of the tractor. For plowing operations with heavy loads or towing large sowing implements, you must mount enough front counter weight in order to ensure the tractor can run safely without raising the front end. The weight of the standard front counterweight frame is 57 kg. (126 lb.).

You can select a maximum of 11 cast-iron front counterweight pieces, each one weighing 22 kg. (48.5 lb.), for a maximum front counterweight load of 242 kg. (534 lb.).



Figure 2-32 Front Counterweights



WARNING: For your safety, you must mount enough counterweight to avoid rolling over when attaching large implements to the tractor.

Operation Instruction

2.15 Driver's Seat Adjustment

2.15.1 Forward and Backward Driver's Seat Adjustment

There is a lever underneath the driver's seat, on the right side. While sitting on the seat, pivot the lever outwards to the right and use your weight to slide the seat forwards or backwards until it is in a comfortable location. Then release the lever and the seat will lock in place.



Figure 2-33 Forward/Backward Driver's Seat Adjustment 1 bolt

2.15.2 Driver's Seat Firmness Adjustment

The driver's seat hand wheel (1) adjusts the seat firmness according to the height and weight of the driver.



Figure 2-34 Driver's Seat Firmness Adjustment



NOTES:

1. For safety, the seat should not be adjusted unless tractor is stopped and in park, to avoid an accident.
2. Making the seat too soft can make running the tractor on uneven surfaces particularly challenging and can cause a loss of sight lines.

2.16 Hydraulic Suspension, PTO, and Electrical System Operation

The Series 82XTC tractor uses a semi-separate hydraulic lifting system (3-point hitch) with two types of adjustment modes: position adjustment and height adjustment. The control handle of the control distributor valve is used to raise and lower farm implements. Push the handle forward to lower an implement; and pull it back to raise an implement. See "Hydraulic Lifting System Adjustment" for the adjustments to reach the maximum raising position and the minimum lowering position.

A power output device (PTO) is used to deliver power to farm machinery. A swing traction device is used with a harrow or a lawn mower.

Operation Instruction

2.16.1 Implement Position/Height Adjustment

When the tractor is pulling a cultivator or a plow, a 3-point lift is used to adjust the tilling depth. The tilling depth is determined by the position of the lowering stop in the reset push rod, which adjusts the height from the ground level to the plow bottom. When adjusting the stop on the 3-point lift, set the stop to the lower limit, and put the 3-point lift control handle in the low position. When the farm implement is lowered to the required depth (the adjustment method is shown in the **Adjustment on the Hydraulic Lift System** section), it will operate at the tilling depth.

NOTE: Adjust tilling depth (draft) control according to implement specifications.

2.16.2 Farm Implement Lowering Speed Adjustment

Select a suitable lowering speed for the farm implement to keep it from being damaged by heavy impact when it contacts the ground. Before delivery of the tractor, the descending speed regulating valve was adjusted. The owner/operator can readjust the valve according to the weight of farm implement and ground hardness.

- To decrease the lowering speed of the farm implement, turn the adjustment valve (A) clockwise.
- To increase the lowering speed of the farm implement turn the adjustment valve (A) counterclockwise.

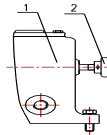


Figure 2-35 Farm Machinery Lowering Speed Adjustment 1. Lift Cover 2. Lower Speed Adjustment Handle

2.16.3 Application of the Hydraulic Output and Lock

- Turn the adjustment valve (B) in a counterclockwise direction until the valve is closed. This will also close the adjustment valve on the inlet and outlet of the oil cylinder. The male connector on the quick change coupler is connected with the oil inlet of the farm implement. The hydraulic output female connector (A) is connected with the male connector on the farm implement. Push the distributor control handle to the lifting position to reach the appropriate hydraulic output. Simple hydraulic output can only control a single-action oil cylinder.

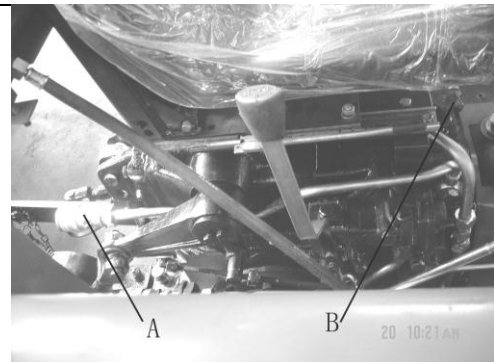


Figure 2-36 Hydraulic Output Controls

Operation Instruction

- When using the hydraulic output, the farm implement should be in the lift position, if the lower speed adjustment valve (B) is closed and the oil in the tank can not return. The farm implement should be locked in the transport position and the adjustment valve can act as the hydraulic lock.



WARNING: When transporting implements in the raised position over long distances, the hydraulic lock should be used to lock the implements in place. This will prevent an accidental move of the distributor control handle from making the farm implements drop suddenly and cause damage.

2.16.4 Hydraulic Control Levers

There are three levers that control the hydraulic system for farm implements towed by the tractor.

- Control lever C controls the first hydraulic control loop (quick disconnects A1 and B1).
- Control lever D controls the second hydraulic control loop (quick disconnects A2 and B2).
- Control Lever E is the 3-point control lever.



C — D — E —

Figure 2-37 Hydraulic Control Levers

2.16.5 Use of Multiway Valve

- Shut off the engine.
- Put the lifter in the lowering position.
- Move the hydraulic output valve operation handle forward and backward, in order to eliminate the pressure in the hydraulic quick disconnect.
- Remove the seal cover of the quick disconnects to be used and clean the connectors.
- Connect a hose with a male connector into the female end of each quick disconnect on the valve. Connect the other ends of these hoses to the oil inlet and outlet of the double-acting oil cylinders on the farm implement. The multiway valve has four female connectors (A1, B1, A2, and B2). A1 and B1 form the first group of the hydraulic output loop and are controlled by control lever C. A2 and B2 form the second group of the hydraulic output loop and are controlled by control lever D.

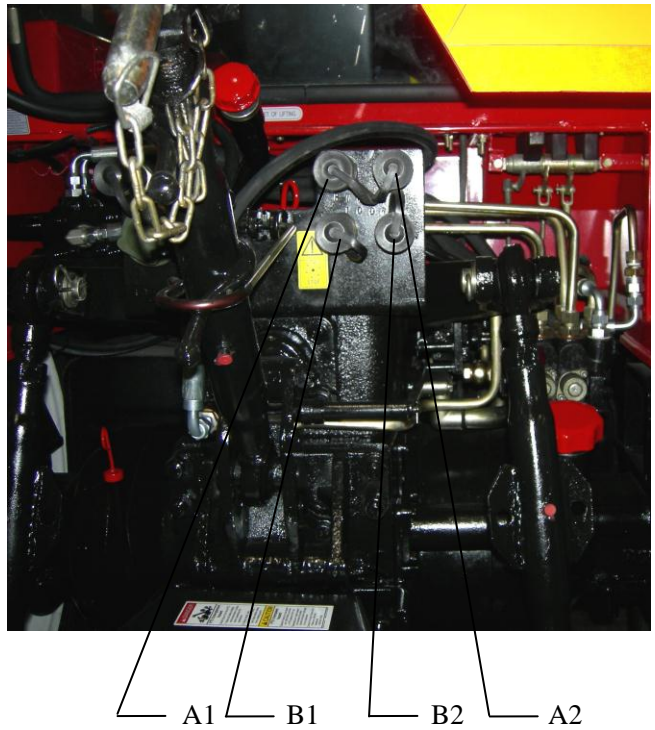


Figure 2-38 Multiway Valve

IMPORTANT ISSUES:

1. When a quick disconnect is not used, the connector seat should be covered with a seal cover to avoid dust.
2. After the hydraulic output device is used, the operating handle should be set to the neutral position, otherwise, the hydraulic system may overheat.

Operation Instruction

2.16.6 Adjustment of the Hydraulic Lift System

When plowing, in order to keep the tilling depth of all the plowshares (blades) consistent from beginning to end, the longitudinal and horizontal level adjustments need to be used.

- Longitudinal level adjustment: Adjust the length of the upper tie rod (A) to keep the plow frame level in the longitudinal direction, so as to make the tilling depth of all the plowshares the same. When the front plowshare is deep and the rear plowshare is shallow or the heel leaves the trench bottom, the upper tie rod should be lengthened. When the front plowshare is shallow and the rear plowshare is deep or the heel compacts the trench bottom, the upper tie rod should be shortened.
- Horizontal level adjustment: Adjust the length of the left and right lifting rods to keep the plow stock level in the horizontal direction. If the right lifting rod (B) is lengthened, the tilling depth of the first plowshare will be deeper. If the right lifting rod is shortened, the tilling depth of the first plowshare will be shallower. In general, the left lifting rod (C) should not be adjusted. The left lifting rod is adjusted only when the adjustment of the right lifting rod is not enough, so as to make the tilling depth of all plowshares the same.
- Plowing Width Adjustment: Tilling width is adjusted mainly through the tilling width regulator. Front and rear relative position for the left and right suspension points can be changed by lowering the plow width regulator. The working width will then be increased when the right suspension point moves forward; otherwise the tilling width will be decreased. You can adjust the device for the furrow width to ensure the plow frame is aligned, which will help to avoid repeating or missed furrowing.



Figure 2-39 Suspension Mechanism

IMPORTANT ISSUES:

1. When plowing, never adjust the traction of the farm machinery by adjusting the limit rod. Instead, reduce the number of plowshares (blades) to match the tractor's pulling capacity. This will help you avoid damaging the suspension mechanism.
2. In order to avoid damage to the implement suspension mechanism when plowing, the tractor should never be turned without lifting the farm implement it is towing.

Operation Instruction

2.16.7 Sway Bar Adjustment

The sway bars are mainly used to prevent impact on the rear wheels of the tractor caused by an overlarge swing of the lower tie rod when the tractor turns around at the end of a field with a lifted farm implement in tow. When the farm implements are in the plowing position, the sway bars are in a loose state. Therefore, a certain amount of swing between the tractor and the farm implement is allowed.



NOTE:

1. When moving the tractor and an attached implement over long distances, the height of the implement should be adjusted to its lowest level by using the adjustable 3-point arm. The adjustable limit rod should also be used to keep the machinery from swinging to the right or left during transport.
2. The nuts for the adjustable 3-point arm and the limit rod should also be tightened to prevent wide swings of the implement during transport.

IMPORTANT ISSUES:

1. When a fast change coupler is not used, the seat hole should be protected with the spare dust cover.
2. The lifter and the hydraulic output valve cannot be operated at the same time.
3. After setting up the auxiliary hydraulic output connection, the operating handle should be set in the neutral position; otherwise, the hydraulic system could overheat.
4. The draft position control lever can control the 3-point hitch.
5. During the course of operation, only one lift handle should be used, and the other one set in the lifting position.



WARNING:

Do not overload the tractor during traction operation or with a trailer. This can result in a loss of performance and may shorten the service life of the tractor.

When braking, the trailer brake will apply slightly earlier than the tractor brake to prevent the load from overturning.

Operation Instruction

2.16.8 Power Take Off (PTO) Shaft Use

To connect and disconnect power to the power take off (PTO) shaft the double-acting clutch, the PTO gear shift handle, and the PTO disconnect control handle are used. When the clutch pedal is pushed down part way it disconnects the engine clutch, and when it is pushed down all the way down it disconnects the PTO clutch. When the PTO gear shift handle is pushed forwards, it will be in high gear. When the PTO handle is pulled backwards, it will be in low gear. Use the following method:

- Remove the rear hitch (only when using the 3-point configuration) and the protective cover on the power take off (PTO) shaft and connect the farm implement drive to the PTO shaft on the tractor.
- Depress the clutch pedal to the floor to disconnect the PTO clutch and put the PTO gear shift handle in the required position (high or low).
- Depress the clutch pedal to the floor again and turn the PTO disconnect control handle to the “connected” position.
- Release the clutch pedal slowly. First operate with the throttle at low speed to check whether the PTO is working properly.
- When repeated work in the same place within a short time frame is required, step on the clutch pedal gently to disconnect the main clutch. This cuts off the power to the tractor transmission, and the tractor stays in one place while the farm implement behind it can still work normally.
- To disconnect the PTO depress the clutch pedal to the floor and turn the PTO disconnect control handle to the “disconnected” position. The PTO gear shift handle does not need to be moved. The PTO shaft will stop turning.
- After disconnecting the farm implement from the PTO shaft, reinstall the protective cover over the PTO shaft. Replace the rear hitch if it had been removed.

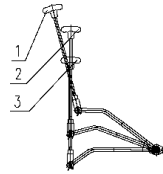


Figure 2-40 Power Output Device Operation

1. High Gear 2. Neutral gear 3. Low Gear



WARNING:

Do not attach or detach anything from the PTO shaft while it is turning. Attempting to do so can result in equipment damage and serious injury. When using farm machinery with a PTO, take care not to lift the farm machinery too high. Too great of an angle between the PTO shaft and the farm machinery drive shaft can cause damage to the machinery.

Operation Instruction

2.16.9 Electrical Equipment Use

The electrical system of the 82XTC Series Tractor uses a 12V double wire system with a negative ground.

2.16.9.1 Battery

The battery is used to store the electrical energy produced by the alternator. The battery can then supply electrical power to the electrical equipment on the tractor when the alternator is not turning or is running at low speed. It can also help with the power supply when the alternator is overloaded for a brief period.

- Frequently remove the dust and mud on the battery shell to avoid electric leakage. Check whether there are any cracks in the battery case and/or leakage of electrolytes. Ensure good contact between the terminals and the battery cables. The air vent on the plastic cover should not be blocked in order to avoid an explosion.
- Frequently check the battery voltage. Charge it when the voltage is low.
- The starter cranking time should not exceed 5 seconds each time to avoid excessive discharging.
- If the tractor is not used for a long time, the battery should be removed for charging and maintenance.

2.16.9.2 Alternator

- The alternator must be used with a matching regulator.
- The silicon rectification alternator is minus “—” grounded. The connection of the positive and negative poles of the alternator, the regulator and the battery must be correct to avoid burnout of the alternator and the regulator.
- Do not strike sparks to determine whether the alternator is generating electricity.
- Remove the key from the ignition switch when the tractor is stopped to cut off the connection between the motor and the battery and prevent the battery from discharging over an extended period of time.

2.16.9.3 Starter

- The starter should not run for an extended period. The starting time should not exceed 5 seconds each time to avoid damage to the starter.
- If a grinding sound (teeth colliding) between the small gear on the starter and the flywheel ring gear is heard when starting, turn the key back to its original position immediately and try again.
- If the starter continues running after the key is back to its original position, shut down the engine immediately and start again after the fault is remedied.

Operation Instruction

2.16.9.4 Auxiliary Electrical Equipment

- The fuse box: has 15 fuses, total, 7 for normal use, and the others for spares. Fuses are used to protect electrical equipment. Replace burned out fuses immediately. Each fuse's rating should coincide with the requirements on the electrical schematic. When a fuse burns out, it is necessary to troubleshoot the cause immediately. Do not substitute a fuse with a higher or lower rating, as this can result in damage to the electrical system.
- The ignition switch is used to turn on the electrical system and preheat and start the diesel engine. Put the key into the ignition switch, turn the key clockwise to the ON position and switch on the electrical system. Turn the key further clockwise to H and switch on the engine preheater. Turn the key still further clockwise to ST engage the starter. After the diesel engine is started, release the key and it will return to the ON position automatically. During normal operations the key is always in the ON position. When the tractor will not be used for a long time the key should be removed from the ignition switch.
- Rear Trailer Socket: For powering the trailer taillights when the tractor is equipped with a trailer, the tractor is equipped with a rear trailer electrical socket. For the socket wiring layout, please see Figure 2-42.

Table 2-2 Wire No., nominal cross-sectional area and the wire color of the electrical devices

Wire No.	Nominal Cross Sectional Area	Wire Color	Wire No.	Nominal Cross Sectional Area	Wire Color	Wire No.	Nominal Cross-Sectional Area	Wire Color	Wire No.	Nominal Cross Sectional Area	Wire Color
1	4.0	Red.R.	13	0.75	GreenBlue (GL)	26	0.75	Orange (O)	39	4.0	Brown (Br)
1b	2.5	Red.R.	14	1.0	WhiteRed (WR)	27	0.75	GreenBlack (GB)	40	0.75	Gray(S)
2	1.5	Pink (V)	15	1.5	BlueRed (LR)	28	0.75	OrangeBlue (OL)	42	2.5	Black(B)
3	4.0	RedWhite (RW)	16	1.0	RedWhite (RW)	29	0.75	GreenGray (GS)	50	1.0	Pink(V)
4	1.5	Yellow(Y)	17	0.75	PinkGreen (VG)	30	0.75	BrownYellow (BrY)	51	1.0	PinkWhite (VR)
5	1.0	Green(G)	18	0.75	Brown (Br)	31	0.75	White (W)	53	0.75	RedBrown (RBr)
6	1.5	Blue(L)	19	0.75	Lightblue (Lu)	32	0.75	BrownWhite (BrW)	54	0.75	BlueGreen (LG)
7	1.0	Yellow Black (YB)	20	0.75	RedWhite (RW)	33	0.75	RedGreen (RG)	55	0.75	RedGray (RS)
8	0.75	GrayWhite (SW)	21	0.75	BlueBlack (LB)	34	1.0	WhiteBlue (WL)	56	0.75	Lightgreen (LuG)

Operation Instruction

9	1.0	RedBlue (RL)	22	0.75	RedBlack (RB)	35	0.75	GreenRed (GR)	57	0.75	GrayBlack (SB)
10	1.5	YellowRed (YR)	23	1.0	Purple (P)	36	0.75	Purple Black(PB)	10a	0.75	YellowRed (YR)
11	1.0	RedYellow (RY)	24	1.5	GreenWhite (GW)	37	1.0	Purple Yellow(PY)	42a	0.75	Black(B)
12	1.0	YellowBlue (YL)	25	0.75	BrownRed (BrR)	38	0.75	BrownGreen (BrG)			

2.16.9.5 Rear Work Light and Taillight

View of rear light and tail lamp assembly (steering, position, braking).



Figure 2-41 Rear Work Light and Taillight

2.16.9.6 Rear Trailer Electrical Socket

The pins of the rear trailer electrical socket are shown in Figure 2-65. If a pin is not marked in the figure, it is not used.

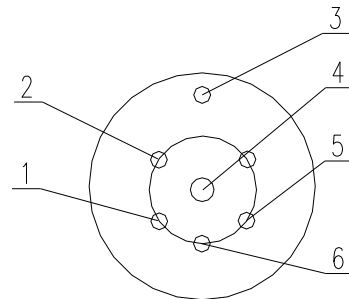


Figure 2-42 Rear Trailer Socket

1. Right turn light power wire 2. Working light power wire 3. Ground wire
 4. Position lamp power wire 5. Braking lamp power wire 6. Left turn light power wire

2.16.9.7 Roof (Work) Lights

Roof (Work) Lights

There are four roof lights on the cab, both front and rear.

The front roof lamp in the cab is shown in the figure 2-43.

Switches on the control panel turn the roof lights on an off.



Figure 2-43 Roof (Work) Lights

Operation Instruction

2.17 Tractor Upper Chassis

The tractor upper chassis includes the following: the hood, the cab (optional), the fenders, the instrument console, the driver's seat, the floor mats, and various attachments.

2.17.1 Tractor Hood

The tractor hood is made of streamlined sheet metal. It protects the engine and radiator.



Figure 2-44 Tractor Hood

2.17.1.1 Opening and Closing the Tractor Hood

Pull the handle on the hood's left side panel to unlock the hood lock, and the hood will automatically open with the help of two gas springs. To close, pull the hood down, and the hood lock will automatically lock when the hood reaches a certain position. A strap between the hood and the frame keeps the hood from opening too far.



Figure 2-45 Opening the Tractor Cover

2.17.2 Instrumentation Console

All the instruments and control switches are installed on the instrumentation console. Other controls that use levers, valve, and linkages are located around the driver in the cab.



Figure 2-46 Instrumentation Console

2.17.3 Cab (optional)

The cab frame has a welded steel tubing frame. It has large windows on all sides, including in both doors and in the lower parts of the front and rear panels. It offers the driver protection against the weather and greater comfort while operating the tractor. It has an HVAC system (heating, ventilating, and air conditioning), an interior light, front and rear windshield wipers, and a top hatch for ventilation and emergency exiting.

Operation Instruction

2.17.4 Cab Fan

The cab has fan vents in two separate locations for the heater and air conditioner.



Figure 2-47 Cab Fan

2.17.5 Cab Interior

The cab interior includes the fenders, the floor mat, the instrumentation console and the roof lining, etc, as shown in Figure 2-46.



Figure 2-48 Cab Interior

2.17.6 Cab Doors

The door frame has a profiled bar. The inside is glazed with monoblock curved glass, which fits seamlessly with the steamlined cab design. It accentuates the comfortable driving space, while greatly improving the styling of the entire tractor.

Rotate the key 90 degrees clockwise to unlock the door.

After removing the key, grab the doorknob, use the thumb to push the compression element (1). At the same time, pull the knob outward and the door will open.

When closing the door, lock the door in the reverse order.

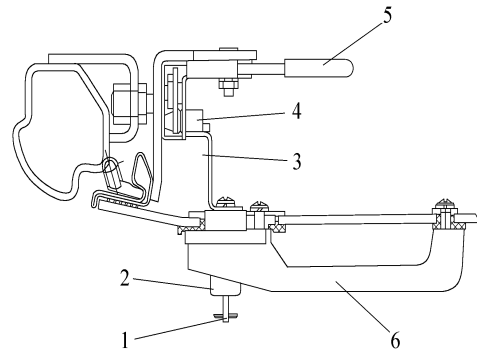


Figure 2-49 Cab Door Lock

- 1. Door key
- 2. Door lock
- 3. Push rod
- 4. Locking plate
- 5. Unlocking handle
- 6. Door handle

Operation Instruction

2.17.7 Left/Right Window

When opening, lift the locking handle and push it outward simultaneously. The maximum distance that the side window can open is the effective length of the locking handle.

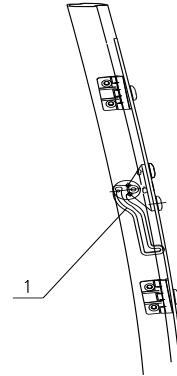


Figure 2-50 Left/Right Window (1), Locking Handle

2.17.8 Rear Window

The rear window has an upper semi-automatic opening; the opening status is divided into normal status and maximum status.

- Normal status: rotate the handle (1) When the front part of the handle protrudes out of the slot, push the handle (1) until the bulge on the rear of the handle reaches the slot. Rotate the handle (1) again to make rear bulge slide into the slot which opens the rear window open.

When closing, follow the steps in the reverse order.

- Maximus status: rotate the handle. When the bulge of the front part slides out of the handle, push the handle outward until it releases the tension of the gas springs.

The gas springs will change from pull to push and the rear window will automatically open. When closing, follow the steps in reverse order.

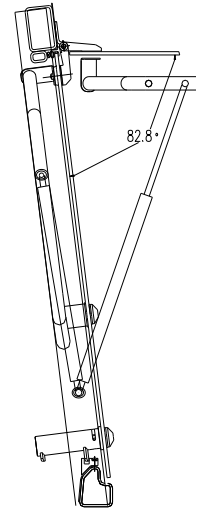


Figure 2-51 Rear Window

2.17.9 Roof Hatch

The roof hatch is made of fiberglass reinforced plastic. When opening, hold the handle and at the same time, press the compression head of the roof window lock with your thumb. The lock will spring open automatically. Push the roof window outward gently, with the help of the gas springs. When closing, operate in reverse order.



Figure 2-52 Roof Hatch with Latch

Operation Instruction

2.17.10 Cab HVAC

There are four HVAC outlets inside the cab. You may adjust the air flow rate and direction by adjusting the vents on each outlet. On the left of the ceiling panel is the HVAC control panel. The control methods are as follows:

2.17.10.1 Individual Ventilation Control

- Switch off the outlet/inlet switch of the heater on the engine.
- Adjust the air flow with the fan switch in the middle of operator panel until you have the desired level of ventilation.



Figure 2-53 Air Conditioner

2.17.10.2 Air Conditioner Control

- Switch off the outlet/inlet switch of the heater on the engine.
- Switch on the compressor on the extreme left of the control panel. and; the air conditioning will then cool the cab.
- Turn the temperature control switch for the air conditioner on the right of the control panel to adjust the temperature.
- Turn the fan switch in the middle of the control pannel to change the amount of cold air supplied.

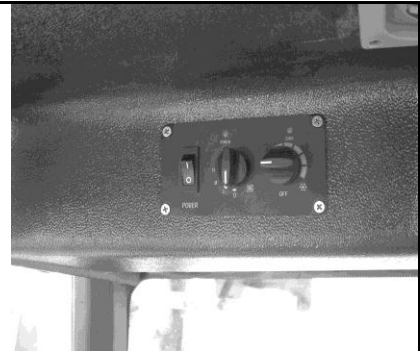


Figure 2-54 Air Conditioner Control Panel

2.17.10.3 Heater Control

- Switch off the AC compressor on the extreme left of the control panel.
- Turn on the inlet/outlet switch for the heater on the engine. Hot water will circulate through the heater, increasing the temperature in the cab.
- Turn the fan switch in the middle of the control pannel to increase and decrease the amount of air flow.

Operation Instruction

2.17.11 Central Electrical Box

The circuit control elements include the power supply relay, electronic flasher, lighting relay and fifteen-fuses.

The operating current of each gear and the electrical devices under its protection are shown in Table 2-3. When an electrical element is broken, check the fuse. If damaged, take down a standby fuse with of the same rating from the circuit board and replace it to protect the electrical elements from damage.

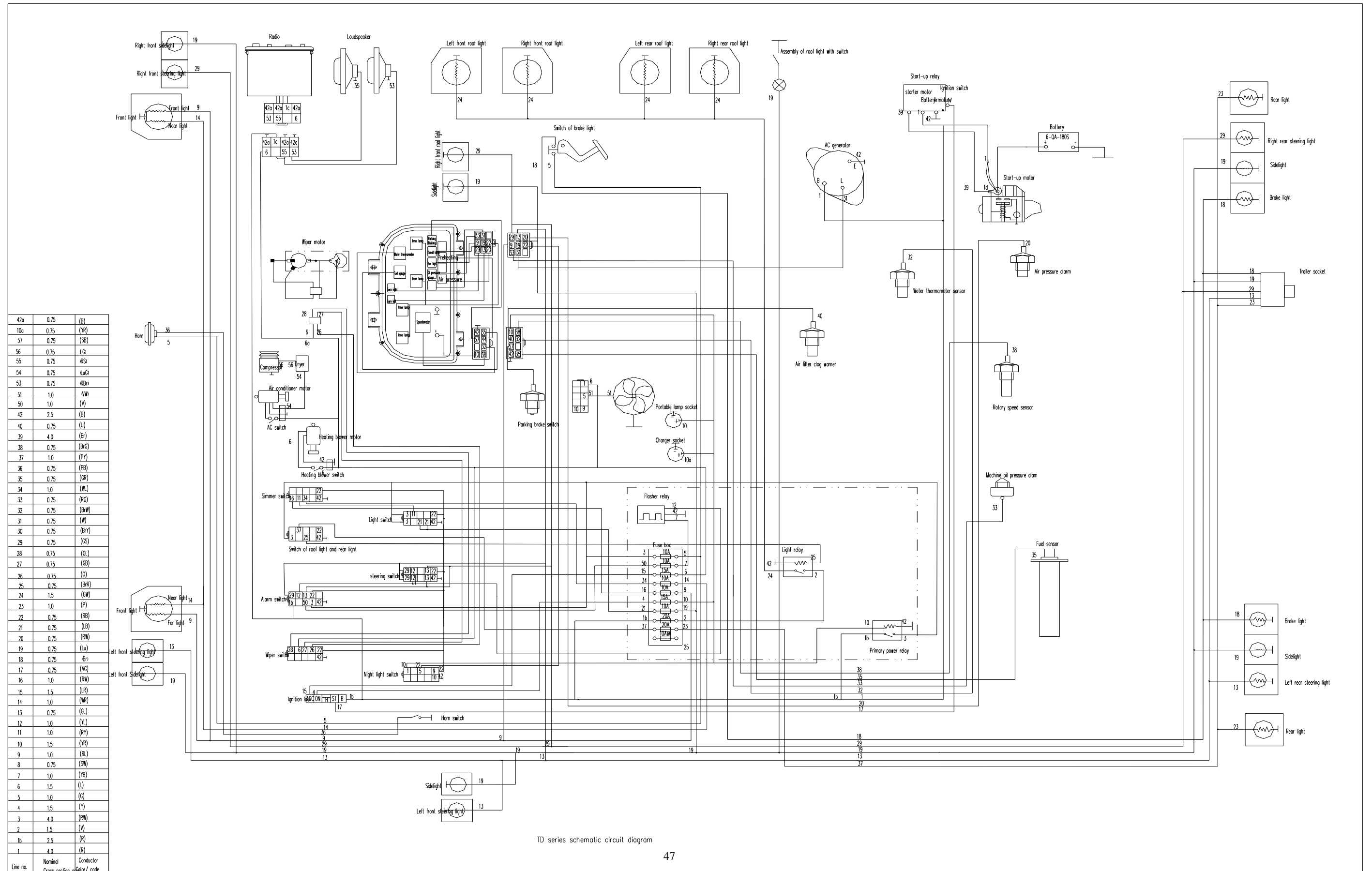


Figure 2-56 Central Electric Box

Table 2-3 Operating Current of Each Gear of the Fuse Box and the Electrical Devices

Gear of Fuse Box	One	Two	Three	Four	Five	Six	Seven	Eight	Nine
Rated Operating Current	10A	10A	20A	10A	10A	20A	5A	20A	15A
Protected Electric Device	Braking lamp and horn	Turn light and warning device	Wiper and air-conditioner	Low beam	High beam	Power accessories	Position lamp	Top light	Lighting relay

Electrical Schematic



42a	0.75	(B)
10a	0.75	(YR)
57	0.75	(SB)
56	0.75	(LG)
55	0.75	(RS)
54	0.75	(LuG)
53	0.75	(RB)
51	1.0	(WB)
50	1.0	(V)
42	2.5	(B)
40	0.75	(U)
39	4.0	(Br)
38	0.75	(BrC)
37	1.0	(PY)
36	0.75	(PB)
35	0.75	(GR)
34	1.0	(ML)
33	0.75	(RC)
32	0.75	(BrW)
31	0.75	(W)
30	0.75	(BrY)
29	0.75	(GS)
28	0.75	(OL)
27	0.75	(SB)
26	0.75	(O)
25	0.75	(BR)
24	1.5	(OW)
23	1.0	(P)
22	0.75	(RB)
21	0.75	(LB)
20	0.75	(RW)
19	0.75	(Lu)
18	0.75	(Br)
17	0.75	(VC)
16	1.0	(RW)
15	1.5	(LP)
14	1.0	(WR)
13	0.75	(GL)
12	1.0	(YL)
11	1.0	(RY)
10	1.5	(YR)
9	1.0	(RL)
8	0.75	(SW)
7	1.0	(YB)
6	1.5	(L)
5	1.0	(G)
4	1.5	(Y)
3	4.0	(RW)
2	1.5	(V)
1b	2.5	(R)
1	4.0	(R)
Line no.	Nominal cross section	Conductor color / code

Operation Description

2.19 Tractor Break-In

Before using the tractor, it should be run for a certain period under the condition of a specified lubrication, rpm and load. The tractor should be checked, adjusted and maintained. This procedure is called break-in.



WARNING: Learn how to operate and control the tractor, before starting the break-in process.

IMPORTANT ISSUES: Break-in needs to be done before any new or overhauled tractor can be put into use. Operating a tractor without first performing the break-in procedure can shorten the service life of the machine. If the break-in procedure is not followed the warranty may be void.

2.19.1 Break-In Preparations

- Check the exterior bolts and nuts of the tractor, and tighten them if necessary.
- Fill each lubrication point with grease according to the Lubrication Chart.
- Check the oil level in the engine oil pan, transmission,-rear axle, lifter, front axle and the steering oil cylinder according to the lubrication chart.
- Fill the fuel tank with diesel fuel.
- Check the radiator for coolant and check the water/antifreeze mixture is 50/50, using a hydrometer.
- Open the fuel shutoff lever.
- Check tire air pressure in all four tires.
- Check the electrical circuits for a good connection.
- Each operating handle should be in the neutral position and the hydraulic handle should be in the lowering position.

2.19.2 Engine Idle Break-In

- Start the engine in the sequence specified in this Operation Manual. After starting, run the engine at idle for 5 minutes to make sure that it is in good working condition, and then gradually increase rpm.
- During engine break-in with no load, check the tractor to make sure that there are no abnormal noises or water, oil or air leaks. Check the readings for the various instruments. If anything appears abnormal, stop and troubleshoot the problem immediately.
- Run the engine at idle for 30 minutes.

Operation Description

2.19.3 Power Output Shaft (PTO) Break-in

- The engine throttle control handle should be set in the medium position and the engine should be run at medium speed. Turn the power output shaft on so that it runs at low speed and high speed respective for 5 minutes each. Check for normal operation.
- The power output shaft should be put in neutral position after break-in.

2.19.4 Hydraulic Suspension System Break-in

Start the engine and operate the lifter handle to lift the suspension mechanism up and down several times to make sure that the hydraulic system is operational. Put some weight on the suspension system (500 kg. or less) and raise and lower the mechanism 50 times or more.

2.19.5 Break-in—No Load

After break-in with the power output shaft and the hydraulic suspension, the entire tractor should be broke-in. During idle break-in, make turns at low speed using the single-side brake and also test the emergency brake at high speed. The break-in sequence and time required should be done in accordance with the specifications defined in table 2-4.

While performing break-in operations, the rotary speed of the engine should be 1500 rpm. During break-in, pay attention to the following:

- Check to see if the electrical equipment and the readings for various instruments is normal.
- Make sure that the engine is running normal.
- Check to see that the clutch engages smoothly, and disengages completely.
- Make sure that the shifting is easy and flexible and that it stays in gear.
- Check the brakes for proper function.
- Check the Differential Lock engagement and disengagement.
- That the engagement/release of the front axle is reliable.
- If any faults are found, troubleshoot immediately before continuing the break-in process.

Operation Description

Table 2-4 82STC Tractor Running-In Specifications (16F+8R shuttle gear shift)

Traction Load(kN)				(0)kN	(3~4)kN	(7~8)kN	(10.5~11.5)kN
Corresponding working item				Empty driving	Freight of the trailer with 4t load	Working with plow on sand clay with a soil specific resistance of 30 ~35 kPa, and a tilling depth of 18-20 cm.	Working with plow on clay with a soil specific resistance of 45 ~50 kPa, and a tilling depth of 20 cm.
Degree of oil throttle opening				3/4	3/4	Full open	Full open
Direction	Shuttle gear	High/Low gear	Main gearbox				
FWD Gear	L-gear	L-gear	1	0.5hr			
			2				
			3				
			4			4hr	5hr
		H-gear	1				
			2	0.5hr			
			3				
			4			4hr	5hr
	H-gear	L-gear	1	0.5hr		4hr	8hr
			2	0.5hr			
			3	0.5hr	2hr		
			4	0.5hr	2hr		
		H-gear	1	0.5hr	4hr	4hr	
			2	0.5hr	4hr		
			3	0.5hr	4hr		
			4	0.5hr	3hr		
REV Gear	L-gear	R-gear	1				
			2				
			3				
			4				
	H-gear	R-gear	1	0.5hr			
			2	0.5hr			
			3	0.5hr			
			4	0.5hr			
Total hours.hr.				7hr	19hr	16hr	18hr

2.19.6 Break-in – With a Load

Load break-in should be performed only after the mechanical condition of the tractor has been thoroughly checked during idle break-in. The load should be from low to high with the speed going from low to high. The break-in sequence and the time should be done in accordance with the break-in specifications defined in tables 2-3.

During break-in, pay attention to the following:

- Check to make sure that the electrical equipment and the readings for various instruments are normal.
- Make sure that the engine is running normal.
- Check to see that the clutch engages smoothly, and disengages completely.
- Make sure that the shifting is easy and flexible and that the transmission stays in gear.
- Check the brakes for proper operation.
- Make sure that the differential lock engages and disengages.
- Make sure that the engagement/release of the front axle is reliable.
- If any faults are found, stop the break-in process until the trouble can be fixed.

2.19.7 Technical Maintenance after Break-in

After break-in, there may be some metal dust and contaminants mixed in with the lube oil of the drive system, lubrication system and hydraulic system of the tractor. The systems should be cleaned and refilled with fresh oil. The tractor should not be put in to normal operation until all of the technical maintenance is completed.

Perform technical maintenance as follows:

1. Drain lubrication oil in the engine oil pan shortly after shutting down the tractor, while the oil is still hot. Replace the oil filter and refill the engine with new oil. Clean the diesel fuel filter and the air filter.
2. Maintain or adjust the diesel engine according to Diesel Engine Instruction.
3. Drain any lubricating oil in the gearbox-rear axle housing while it is hot and refill with new lube oil.
4. Drain the hydraulic oil in the hydraulic lifter and the steering oil cylinder while it is hot. Clean the filters and then fill both with new hydraulic oil.
5. Replace the 50/50 water/ antifreeze in the cooling system with a new 50/50 mix.
6. Fill each lubrication point with grease according to the Lubrication Chart.
7. Check the front wheel toe-in and the free stroke of the clutch/brake pedal, and adjust if necessary.

Operation Description

8. Check and tighten all of the exterior screws, bolts and nuts.

IMPORTANT NOTE: The length of clutch release pull rod should be checked and adjusted frequently to ensure that clutch pedal has 40–4 mm. free stroke, and a 2.5 mm. clearance exists between the clutch release bearing and the three release lever fingers. Otherwise, the clutch release bearing and friction disk will heat excessively.

Operation Description

2.20 Common Faults and Troubleshooting

2.20.1 Clutch Faults and Troubleshooting

Table 2-5 Clutch Faults and Troubleshooting

Fault	Causes	Solutions
The clutch slips	(1) The clutch plate and pressure plate are dirty or greasy (2) The clutch plate is excessively worn or burnt (3) The Belleville spring pressure is too low (4) The free play of the pedal is too small or there is no free play (5) The clutch fingers are badly deformed	(1) Clean with solvent. Find the cause and eliminate the fault (2) Replace the clutch plate (3) Replace the spring (4) Re-adjust the free play of the pedal according to the specifications (5) Replace the clutch fingers
The clutch does not disengage completely, and noise is heard when it is engaged	(1) The free play of the pedal is too large and the working play is too small (2) The clutch fingers are excessively warped (3) The heads of the three clutch fingers are not in the same plane	(1) Adjust the free play of the pedal according to the specifications (2) Replace the clutch fingers (3) Adjust according to requirements
The tractor shakes when starting	(1) The heads of the three clutch fingers are not in the same plane (2) The clutch plate and the clutch fingers have grease on them (3) The clutch fingers are warped (4) The fastening screw for the flywheel and the clutch has come loose	(1) Make adjustments according to requirements (2) Clean the friction plate and the clutch fingers with solvent (3) Replace the clutch fingers (4) Stop the tractor immediately and repair the fault
When the main clutch is disengaged, the power output (PTO) shaft stops rotating	(1) Not enough clearance between the upper adjustment bolt head of the main pressure plate and the projecting lug on the auxiliary pressure plate	(1) Adjust according to requirements
The power output (PTO) shaft does not stop rotating when the clutch is depressed	(1) Too much clearance between the upper adjustment bolt head on the main pressure plate and the projecting lug on the auxiliary pressure plate (2) The three grooves for locating the auxiliary pressure plate lug into the clutch cover are too shallow	(1) Adjust according to requirements (2) Add shims to bring into adjustment

Operation Description

2.20.2 Gearbox Fault and Troubleshooting

Table 2-6 Gearbox Faults and Troubleshooting

Fault	Causes	Solutions
Putting the tractor into gear is difficult or impossible	(1) Clutch has not disengaged completely (2) Gearshift interlocking rod is too long (3) The shift lever fork is severely worn (4) The end face of the engagement sleeve or the end face of the gear is worn or broken	(1) Troubleshoot according to the clutch type (2) Shorten the gearshift interlocking pull rod (3) Replace the shift lever (4) Replace or repair
Gearshift disengages automatically	(1) The gearshift interlocking rod is too short (2) The locating slot of the shifting fork shaft is severely worn (3) The spring pressure of the interlocking latch is insufficient (4) The bearing on the gear shaft is worn, making the shaft tilt (5) The spline of the tooth holder is worn	(1) Lengthen the gearshift interlocking pull rod (2) Replace the shift fork (3) Adjust or replace the interlocking pin spring (4) Replace the bearing (5) Replace the tooth holder
Random gear shifting	(1) The shift lever fork is worn (2) The gear guide plate is severely worn (3) The fork slot of the shifting fork and the meshing bush are worn (4) Locating pin of interlocking pin and shift fork is severely worn	(1) Repair or replace the shift lever (2) Replace the gearbox guide plate (3) Replace the shifting fork and the meshing bushing (4) Replace the interlocking pin and the shift fork shaft
Noise or impact sound from the gear box	(1) The gear is excessively worn and/or the tooth surface has chipped off (2) The bearing is badly worn or damaged (3) The lubricating oil is insufficient or oil quality does not conform to the specifications	(1) Replace the gear (2) Replace the bearing (3) Fill or replace lube oil
Oil goes into gearbox body or clutch housing	(1) Failure of the rear oil seal of the engine crank shaft (2) No.1 bearing oil seal seat or No.1 transmission shaft failure	(1) Replace (2) Replace
Oil coming from gear shift lever	(1) Plugged air filter element for the rear axle or for the gearbox cover	(1) Clean or replace filter

Operation Description

2.20.3 Rear Axle Faults Troubleshooting

Table 2-7 Rear Axle Faults and Troubleshooting

Fault	Causes	Solutions
Increased noise in the central drive	(1) The bearing play of the small conical gear is too large (2) Gear engagement is abnormal (3) The bearing of the conical gear pair or the gear pair is damaged (4) The differential shaft is worn or locked (5) The planetary gear or gasket is worn (6) The differential bearing is worn or damaged	(1) Adjust according to requirements (2) Readjust according to requirements (3) Replace the bearing or the gear (4) Replace differential gear shaft (5) Replace planetary gear or shim (6) Replace differential bearing
Small conical gear and the differential bearing overheat	(1) The pre-load force is too high (2) Oil level is low - poor lubrication (3) Backlash at gear pair side of conical gear is too small	(1) Readjust the pre-load force of the bearing (2) Check the lubricating oil level and add if necessary (3) Readjust the gear backlash
Abnormal noises from the final drive	(1) The bearing, gear or shaft is damaged	(1) Replace the bearing, gear or shaft
Differential lock handle does not return	(1) Failure of the differential lock return spring (2) Differential lock push rod stuck.	(1) Replace (2) Dismantle, clean or de-burr

2.20.4 Brake Faults Troubleshooting

Table 2-8 Brake Faults and Troubleshooting

Fault	Causes	Solutions
No brakes	(1) The free play of the brake pedal is too large (2) The brake shoes are severely worn or warped (3) The engagement of the brake pedal is misadjusted (4) Oil on the brake shoes (5) Brake shoes are worn	(1) Readjust the free play of the brake pedal (2) Replace the brake shoes (3) Adjust the engagement of the brake pedal according to the specifications (4) Check or replace brake cylinder oil seal (5) Replace brake shoes
Brakes get hot	(1) The brake shoes do not return (2) The brake shoes do not completely disengage from the brake drums	(1) Replace the return spring (2) Make adjustments according to requirements

Operation Description

The tractor pulls in one direction when braking	<ul style="list-style-type: none"> (1) The free play of the left and right brake pedals are not the same (2) The brake shoes on one side are damaged or worn unevenly (3) The air pressure of the two rear tires is not the same 	<ul style="list-style-type: none"> (1) Adjust (2) Replace the brake shoes (3) Check and inflate the tires according to the specifications
Brakes do not completely disengage	<ul style="list-style-type: none"> (1) Brake pedal free play is too small (2) Brake return spring failure (3) Inadequate clearance between brake shoes (4) Brake pedal not returning 	<ul style="list-style-type: none"> (1) Adjust (2) Replace (3) Adjust (4) Check the return spring

2.20.5 Four-Wheel Drive System Faults and Troubleshooting

Table 2-9 Front Drive Axle Faults and Troubleshooting

Fault	Causes	Solutions
The front tire has excessive wear	<ul style="list-style-type: none"> (1) The rim or the radial plate of the front wheel is deformed (2) The toe-in has been improperly adjusted (3) The bearing pins of the steering knuckle and the oil cylinder are severely worn (4) The tire pressure is too low (5) The front drive axle does not disengage during operation (6) The drive tread of the front tire is mounted backwards 	<ul style="list-style-type: none"> (1) Align the front wheel rim or the radial plate (2) Adjust the toe-in (3) Replace the bearing pin(s) (4) Inflate the tires according to the specifications (5) Disengage the front drive axle or repair it (6) Reinstall the tire according to requirements
The front wheel shakes	<ul style="list-style-type: none"> (1) Fastening nuts and bolts for the ball pins, oil cylinder and the steering arm are loose (2) The toe-in has been improperly adjusted (3) The clearance of the bearing is too great, or the bearing is severely worn (4) The rim of the front wheel is severely deformed 	<ul style="list-style-type: none"> (1) Check and tighten (2) Adjust the toe-in (3) Adjust or replace the bearing (4) Align or replace the front wheel rim
Loud noise (four wheel drive tractors)	<ul style="list-style-type: none"> (1) Engagement trace of the front central drive gear is bad (2) The clearance of the central drive bearing is too great or the bearing is damaged (3) The differential axle is worn or damaged (4) The planetary gear or gasket is worn (5) The meshing of the final planetary gear pair is bad 	<ul style="list-style-type: none"> (1) Readjust the gear meshing backlash (2) Adjust or replace (3) Replace the differential axle (4) Replace planetary gear or the gasket (5) Replace planetary drive gear
The drive shaft and sleeve overheat	<ul style="list-style-type: none"> (1) The transmission shaft is severely bent or deformed, creating friction 	<ul style="list-style-type: none"> (1) Replace the transmission shaft
Loud noise in the transfer case	<ul style="list-style-type: none"> (1) Using too high a gear (2) The bearing or the gear is badly worn 	<ul style="list-style-type: none"> (1) Put into low gear (2) Replace

Operation Description

2.20.6 Hydraulic Steering System Faults and Troubleshooting

Table 2-10 Steering System and Running System Faults and Troubleshooting

Fault	Causes	Solutions
Free stroke of steering system is too large	<ul style="list-style-type: none"> (1) Steering gear thrust bearing worn (2) Steering gear screw, nut and ball worn (3) Gear sector and rack worn 	<ul style="list-style-type: none"> (1) Replace bearings or adjust (2) Replace wearing parts (3) Adjust
Mechanical and hydraulic steering is too heavy	<ul style="list-style-type: none"> (1) Upper ball seat screw of the steering thrust bearing is too tight (2) The air pressure of front wheel tire is low (3) Oil delivery of gear oil pump is not enough. Gear oil pump leaks inside or oil screen inside the steering oil tank is blocked, light at slow speed and heavy at rapid speed (4) Air exists in steering system, when rotating steering wheel, oil cylinder sometimes moves and sometimes does not move (5) Oil level in steering oil cylinder is insufficient (6) Spring elasticity in relief valve is weak or the steel ball is not sealed; a light load is steering lightly, and steering becomes heavier if load is increased (7) Oil viscosity too high (8) Steel ball check valve in the valve body fails, steering wheel is heavy when turning it slowly or quickly, and steering is weak (9) Oil leakage from steering system, including inside and outside 	<ul style="list-style-type: none"> (1) Properly tighten upper ball seat screw (2) Fill with air according to the requirements (3) Check if gear oil pump is normal. Clean the filter screen (4) Discharge the system and check if any air is in the oil inlet line (5) Fill oil to the specified level (6) Wash safety valve and adjust safety valve spring pressure (7) Apply the specified oil (8) Clean, do maintenance and change (9) Check and find the leaking points
Front wheel swings	<ul style="list-style-type: none"> (1) Clearance between tapered roller bearing and housing of front bearing is too large (2) Steering ball joint is seriously worn (3) Gasket between the swing shaft and bracket is worn (4) Toe-in of front wheel is abnormal (5) Front wheel ring is seriously worn (6) Air in steering hydraulic cylinder 	<ul style="list-style-type: none"> (1) Adjust the clearance to the specified requirements (2) Replace (3) Replace (4) Adjust (5) Correct (6) Bleed air from cylinder
Earlier than normal tire wear on front tire	<ul style="list-style-type: none"> (1) Toe-in of front wheel is abnormal (2) Pressure in the tire is incorrect (3) Drive tire thread mounted in reverse 	<ul style="list-style-type: none"> (1) Adjust (2) Add air according to specs (3) Reassemble
Oil leak	<ul style="list-style-type: none"> (1) Rubber O-rings at various pipe joints are damaged or loose (2) O-rings in hydraulic steering gear valve body, stator and rear cover are damaged (3) The O-ring at the axle journal is damaged (4) The bolts at the joint of the steering rack or the hub subassembly have loosened 	<ul style="list-style-type: none"> (1) Replace the O-ring or tighten the fitting (2) Clean or replace the O- ring (3) Replace the O- ring (4) Tighten the bolts

Operation Description

<p style="text-align: center;">Heavy steering</p>	<p>(1) The oil supply to the gear oil pump is insufficient, or the gear oil pump leaks inside or the filter screen in the steering oil tank is blocked. The steering is light at low speed and heavy high at high speed</p> <p>(2) Erratic steering cylinder movement when the steering wheel is turned</p> <p>(3) The oil level in the steering oil cylinder is too low</p> <p>(4) The spring tension in the relief valve has weakened, or the steel ball is not seated correctly. With a light load the steering is light but the steering becomes heavier as the load increases</p> <p>(5) Oil viscosity is too thick</p> <p>(6) Steel ball check valve in the valve body has failed. The steering is heavy when turning slowly or weak when turning sharply</p> <p>(7) Oil leakage from the steering system, both inside and outside</p> <p>(8) Air in the steering system</p>	<p>(1) Check the gear oil pump. Clean the filter screen</p> <p>(2) Bleed the air from the system and check whether there is air or an air leak in the oil suction pipe</p> <p>(3) Fill oil to specified height, clean the relief valve and adjust the spring pressure in the relief valve</p> <p>(4) Replace defective relief valve components</p> <p>(5) Drain oil and replace with the specified oil</p> <p>(6) Replace valve</p> <p>(7) Troubleshoot to find the location of the oil leak and repair or replace leaking components</p> <p>(8) Bleed air from steering system</p>
<p style="text-align: center;">Steering fails</p>	<p>(1) The king pin is broken or deformed</p> <p>(2) Rotor and linkage shafts are improperly mounted or misaligned</p> <p>(3) Steering cylinder or piston seal ring is damaged</p>	<p>(1) Replace the king pin</p> <p>(2) Refit and realign</p> <p>(3) Replace the piston or the seal ring</p>
<p style="text-align: center;">Power steering fails</p>	<p>(1) The clearance between the rotor and the stator on the pump is too large</p> <p>(2) During power steering, the driver cannot feel the endpoints of the extreme steering positions. During manual steering, the Steering wheel turns but the steering cylinder does not move</p>	<p>(1) Replace the pump</p> <p>(2) Replace cylinder</p>
<p style="text-align: center;">Steering is slow to respond or hard to turn</p>	<p>(1) The clearance between the valve core and the valve housing is too large</p> <p>(2) The clearance between the interlocking shaft and the fork pin is too large</p> <p>(3) The clearance between the interlocking shaft and the rotor is too large</p> <p>(4) The return spring is broken or too soft</p>	<p>(1) Replace</p> <p>(2) Replace</p> <p>(3) Replace</p> <p>(4) Replace</p>

Operation Description

Steering wheel does not return to neutral position when steering	<ul style="list-style-type: none"> (1) Steering cylinder leaks oil (2) In the neutral position, when the oil pressure is too high or the steering wheel stops turning, the steering cylinder will not return center (neutral) (3) Steering shaft and hydraulic control valve core are not aligned 	<ul style="list-style-type: none"> (1) Find and fix oil leak (2) Replace (3) Reassemble and adjust
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2.20.7 Hydraulic Hitch System Faults and Troubleshooting

Table 2-11 Hydraulic Hitch System Faults and Troubleshooting

Fault	Causes	Solutions
Unable to lift either a light or heavy load	<ul style="list-style-type: none"> (1) Oil level within the 3-point lift is too low (2) Strainer in the oil filter is blocked (3) Air is getting into the oil suction line (4) Gear oil pump failure (5) Spring pin on the outside/inside end of the operation handle has fallen out (6) The swing rod inside the hydraulic distributor dropped (7) The main control valve seized at the middle or lowering position, or the oil return valve seized in the open position (8) Main control valve seized (9) Lowering valve seized (10) Pin shortened, or lowering valve assembly comes loose making it unable to open the lowering valve (11) The oil passage from the cylinder end to oil cylinder is closed 	<ul style="list-style-type: none"> (1) Add oil to the specified oil level (2) Clean or replace the strainer on the oil filter (3) Check for air leaks (4) Replace the geared oil pump (5) Reinstall the spring pin (6) Open the distributor, and install the swing rod (7) Take apart the distributor, and clean each valve (8) Clean main control valve (9) Clean lowering valve (10) Remove plug for lowering valve, readjust the clearance of the lowering valve push pin or tighten the lowering valve assembly (11) Open the oil passage
Light load can be lifted, but heavy load cannot be lifted or lifts slowly	<ul style="list-style-type: none"> (1) Air is entering the oil suction line (2) Adjustment pressure of the system safety valve is too low (3) Adjustment pressure of the oil cylinder safety valve is too low (4) Gear oil pump is worn or pressure is inadequate (5) Oil cylinder seal ring is leaking 	<ul style="list-style-type: none"> (1) Check the oil suction pipe and oil filter (2) Replace the system safety valve (3) Replace the oil cylinder safety valve (4) Replace the geared oil pump (5) Replace the seal ring on the oil cylinder
Farm implements shake during lifting and/or	<ul style="list-style-type: none"> (1) Oil filter is blocked (2) Air getting into the oil suction pipe 	<ul style="list-style-type: none"> (1) Replace the filter element (2) Replace the O-ring seal

Operation Description

Fault	Causes	Solutions
lift slowly	(3) Gear oil pump failure (4) Hydraulic oil level is too low	(3) Replace the gear oil pump (4) Add lubricating oil according to the requirements
Farm implements slowly drop after being lifted, and the descent becomes faster after turning off the engine	(1) The tightness of the check valve in the hydraulic flow distributor is poor (2) The lowering valve is not sealed tightly (3) The oil cylinder safety valve leaks oil or is not adjusted properly (4) The O-ring for the oil cylinder is damaged or leaking (5) The seal ring between the distributor or the cylinder head and the oil inlet hole on the 3-point lifter shell is improperly installed or damaged	(1) Clean the check valve. (2) Clean or replace the lowering valve (3) Repair or readjust the safety valve on the oil cylinder (4) Replace the O-ring (5) Check and replace the seal ring
With the 3-point lift lever at lifting position, the hydraulic distributor makes a loud noise	(1) Because of improper adjustment, the inner lifting arm props against the lifter case to open the safety valve	(1) First measure the lifting height of the farm implement. Then readjust and shorten the force/position adjusting rod to make the highest lifting position lower than the original position
The 3-point hitch has no hydraulic pressure or weak output	(1) The oil cylinder inlet line has been disconnected (2) The front cone and conical hole of the speed lowering control valve have not been sealed tightly (3) Lifter is in the neutral lifting position	(1) Tighten the lowering speed adjustment knob clockwise to reduce the lowering speed (2) Replace the valve (3) Push the lifter control handle to the lowering position to lower the outer lifting arm to the lowest position. Shut off the inlet oil line to the oil tank, and then put the operating lever in the lift position
Hydraulic cylinder lifts slowly or not at all	(1) Inner leakage from relief valve (2) Low oil pump output	(1) Clean and readjust or replace relief valve (2) Replace the oil pump
No oil pressure in the 3-point lift	(1) Pressure in relief valve is too low (2) Oil leakage in the system (3) Oil pump malfunction	(1) Replace the relief valve or the hydraulic oil (2) Find and repair leaks (3) Repair or replace oil pump
Oil leaks around front differential housing or rear differential housing	(1) Seal ring damage	(1) Replace the leaking seal ring

Operation Description

2.20.8 Starter Faults and Troubleshooting

Table 2-12 Starter System Faults and Troubleshooting

Fault	Causes	Solutions
Starter does not turn over	<ul style="list-style-type: none"> (1) Battery capacity is insufficient (2) Battery terminal is dirty (3) Cable connection is loose (4) The wires in control circuits such as the start switch are broken (5) Poor contact between carbon brushes and commutator in starter (6) Broken circuit or short circuit within the starter 	<ul style="list-style-type: none"> (1) Charge the battery according to the specifications (2) Remove dirt and corrosion (3) Tighten cable connector (4) Check circuits for breaks and shorts (5) Replace starter (6) Replace starter
Starter is weak	<ul style="list-style-type: none"> (1) Battery capacity is insufficient (2) Poor battery cable connection (3) The commutator surface is burnt and/or has oil stains (4) The carbon brushes are abraded too much or the spring pressure is insufficient, which causes poor contact between the carbon bush and the commutator (5) Bad contact in rectifier (6) The main contacts of the solenoid switch are burned, resulting in a poor connection (7) The bearing is abraded severely, and the armature grates against the case 	<ul style="list-style-type: none"> (1) Charge the battery according to specifications (2) Tighten the cable connections (3) Polish the commutator surface or remove the oil stains (4) Replace starter (5) Replace starter (6) Replace starter (7) Replace starter
After the engine has been started, the starter continues to run but makes a sharp noise	<ul style="list-style-type: none"> (1) Lever return spring is broken or loose (2) Tooth surface on starter pinion gear snapped or locked (3) Stuck contact(s) on starting relay (4) The ignition switch does not return automatically after starting 	<ul style="list-style-type: none"> (1) Replace starter (2) Replace starter (3) Replace the starting relay (4) Replace the ignition switch

Operation Description

2.20.9 Alternator Faults and Troubleshooting

Table 2-13 Alternator Faults and Troubleshooting

Fault	Causes	Solutions
The alternator does not generate electricity	(1) Wiring is wrong, broken, and/or making poor contact (2) Rotor circuit broken (3) Rectifier diode damaged (4) Carbon bushes are not making proper contact (5) Regulator is damaged	(1) Check and repair the circuits (2) Replace alternator (3) Replace alternator (4) Replace alternator (5) Replace alternator
The alternator is not charging properly	(1) The drive V-belt is loose (2) Bad contact with the carbon brush and the commutator (3) The regulator is damaged (4) Not enough electrolytes in the battery or battery is sulfurized or too old	(1) Adjust the tension of the drive V-belt (2) Replace alternator (3) Replace alternator (4) Replace battery
The alternator is overcharging	(1) Regulating voltage for the regulator is too high	(1) Replace the voltage regulator

2.20.10 Battery Faults and Troubleshooting

Table 2-14 Battery Faults and Troubleshooting

Fault	Causes	Solutions
The battery capacity is low and the engine is hard to start	(1) Short circuit between electrode plates in the battery (2) Sulphurization of the electrode plates in the battery (3) Poor circuit connector contact, or too much oxidation	(1) Replace battery (2) Replace battery (3) Clean battery terminal, securely fasten cable connector, and coat with a layer of petroleum jelly
Excessive battery discharging	(1) Impurities in the electrolytes (2) Short circuits exist in the electrical system (3) Short circuit caused by placement of a metal tool or bar between positive/negative posts (4) Corrosion on battery terminals or cables	(1) Replace battery (2) Troubleshoot and repair (3) Remove metal object, replace battery if necessary (4) Clean and replace if necessary

Operation Description

2.20.11 Instrument Faults and Troubleshooting

Table 2-15 Instruments Faults and Troubleshooting

Fault	Causes	Solutions
The water temperature gauge always indicates a low temperature	(1) Break in the circuit or the plug is making poor contact (2) The water temperature sensor is damaged (3) The water temperature gauge is broken	(1) Overhaul the circuit, or remove the dirt at the plug (2) Replace the water temperature sensor (3) Replace the gauge
The water temperature gauge always indicates a high temperature	(1) The water temperature sensor is damaged (2) There is a broken circuit or a short circuit (3) The water temperature gauge is broken	(1) Replace the water temperature sensor (2) Check and repair-circuit faults (3) Replace the gauge
The oil pressure gauge is abnormal	(1) The oil pressure sensor is damaged (2) There is broken circuit or a short circuit (3) The oil pressure gauge is bad	(1) Replace the oil pressure sensor (2) Check and repair circuit faults (3) Replace the gauge

Operation Description

2.20.12 Headlight/Taillight/Work Light Faults and Troubleshooting

Table 2-16 Headlight/Taillight/Work Lights Faults and Troubleshooting

Fault	Causes	Solutions
The headlights have no high beam or low beam	(1) Circuit broken, short circuit, or a blown fuse (2) Bad contact or damage to the headlight switch (3) Burned-out filament in bulb	(1) Check and repair, then reconnect (2) Check and replace if necessary (3) Replace bulb
The taillights do not work	(1) Circuit broken, short circuit, or a blown fuse (2) Bad contact or damage to the taillight/instrument light/work light switch (3) Burned-out filament in bulb	(1) Check and repair, then reconnect (2) Check and replace if necessary (3) Replace bulb
The rear work lights or instrument lights do not work	(1) Circuit broken, short circuit, or a blown fuse (2) Bad contact or damage to the taillight/instrument light/work lights switch (3) Burned-out filament in bulb	(1) Check and repair, then reconnect (2) Check and replace if necessary (3) Replace bulb

3. Accessories and Consumables

3.1 Accessories

Tractor accessories include the heater, interior decoration, floor mats, AC, swing traction rod, etc.

3.1.1 Heater

The tractor cab heater is in the top front of the cab. There is a heater switch on the heater that turns the heater fan on and off, in order to ensure a comfortable working temperature in the cab. The engine coolant supply valve must be turned on to use the heater.

When ventilation is needed in the cab, especially in the summer, unheated air can be supplied by turning off the engine coolant supply valve and turning on the fan.

The heater and the air conditioner both use four circular vents just inside the front window of the cab, and two vents above the driver's head. All the vents are located in the cab headliner.



Figure 3-1 Heater

3.1.2 Floor Mats

The floor mats consists of four pieces made of 10 mm. soft rubber. The mats are fixed on the floor with plastic buckles. When removing, the floor mat can be taken up only after the button/snaps are pried up slightly with a screwdriver. To put them back, place them in the original position and reapply the buckles.

3.1.3 Fender Gaskets

With applied PVC foam surface adsorption material and molding, the whole fender gaskets are fixed on to the right and left fender by plastic buckles.

3.1.4 Swing Traction Rod

The swing traction rod is used for traction type farm implements.
The traction rod is connected to the farm implement with a traction pin.
The traction rod can swing both ways, which makes mounting farm implements more convenient. However, when the tractor is towing a farm implement backward, the positioning pin (1) must be inserted into the hole of the traction plate, in order to stabilize the traction rod
(2) The traction point can be adjusted to the right height by turning the traction rod, in order to connect the farm implement.

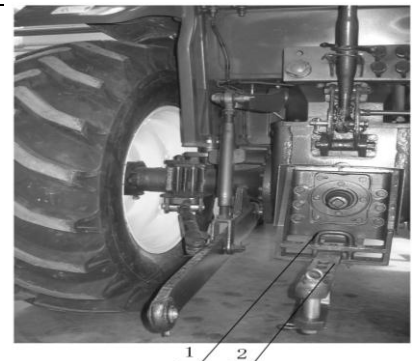


Figure 3-2 Swing Traction Rod
1. Positioning Pin 2. Traction

3.1.5 Air Conditioner

The air conditioner is located between the headliner of the cab roof cab roof panel. Air conditioner controls are located on the left side of the headliner, above the driver. Air supply vents for the AC unit are also in the headliner. The AC unit runs on tractor electrical power. The engine coolant supply valve must be turned off before starting the air conditioner.

3.1.6 Cab Interior Light and Sun Shade

The cab includes an interior light above the front window. It is controlled by a switch on the light and by the headlights switch. The sun shade is inside the front window, at the top.

IMPORTANT NOTE:

When the tractor is equipped with a heater or air conditioner, the engine cooling system must have antifreeze at all times, in order to prevent the engine and cooling system from freezing or overheating. Use a 50/50 water/antifreeze blend.

Accessories and Consumables

3.2 List of Consumable Parts (not included with tractor purchase)

Consumables for NorTrac 82XTC tractor include: all bearings listed in appendix 10.4, all oil seals listed in Appendix 10.5, all fuses, bulbs, various rubber boots, various glass products and belts used for the whole machine in table 3-2.

Table 3-2 Consumable Parts

Sequence No.	Code	Description	Quantity/set	Remark
1	TD800.451F-01	Front windshield glass	1	Model EC
2	FT800A.45.612	Front- left window glass	1	
3	FT800A.45.613	Front-right window glass	1	
4	FT800A.45.401	Left door glass	1	
5	FT800A.45.501	Right door glass	1	
6	TD800.452-01	Glass of rear lower window	1	
7	TD800.452-06	Rear floor glass	1	
8	TD800.452-09	Seal boot	1	
9	TF1004.452-11	Seal boot	1	
10	FT800A.37.307	Rubber boot	2	
11	FT800A.45.130	Dust cover	1	
12	GE20H4.34.13-01	Fuse 5 A	2	
13	DE2383.51.6-04	Fuse 10 A	8	
14	DE2383.51.6-05	Fuse 15 A	2	
15	DE2383.51.6-06	Fuse 20 A	3	
16	12V-H4-55/60W	Double-filament bulb for high beam and dipped headlight	2	
17	12V-1141-21W	Steering lamp bulb	6	
18	12V-89-5W	Positioning lamp bulb	6	
19	12V-H3-35W	Rear work lamp bulb	2	
20	12V-H3-55W	Top work lamp bulb	4	
21	12V-1141-21W	Braking lamp bulb	2	
22	T64401010	Engine fan belt	1	Type of LOVOL power engine
24		Air conditioner compressor belt	1	Type of LOVOL power engine

Accessories and Consumables

IMPORTANT NOTES:

1. All the above-mentioned consumables are special parts for the tractor. Please keep them in an upright position and avoid losing part needed for future use, maintenance and repair. If parts are lost, the machine's performance may be affected or degraded.
2. When maintaining and repairing the tractor, the spare parts specified by the supplier should be used. Otherwise, the machine's operation, performance and work life may be affected.

4. Maintenance Instructions

4.1 Technical Maintenance Procedures

Technical maintenance includes a series of procedures, such as regularly cleaning, checking, lubricating, tightening, and adjusting every part of the tractor and replacing parts when necessary. Regular maintenance can reduce wear on the tractor components, prevent breakdowns, extend the tractor's work life and keep the tractor in good working order. The technical maintenance schedule for the NorTrac 82XTC Series tractor is based on the accumulated work hours, which includes maintenance for every shift (every 10 work hours), every 50 work hours, every 250 work hours, every 500 work hours, every 1000 work hours, every 1600 work hours, and maintenance in winter and for long-term storage.

IMPORTANT ISSUES:

1. All maintenance should be carried out by the owner/operator or a trained service professional who is familiar with the tractor.
2. In order to make the tractor work properly and to prolong its service life, technical maintenance procedures must be strictly observed during running-in and normal operation.
3. The tractor warranty can be voided at any time should damage happen as the result of any operator who is unfamiliar with the tractor or when specified maintenance procedures are not performed according to manufacturer specified timelines.
4. Opening the engine and hydraulic system safety valve, the relief valve, and the voltage regulator are prohibited, without prior manufacturer authorization. Making adjustments to these sensitive areas may cause damage to the tractor, and invalidate the warranty.

Maintenance Instructions

4.1.1 Technical Maintenance for Every Shift (every 10 work hours)

1. Remove the dust, oil and dirt from the tractor, and clean the air filter if working in dusty conditions.
2. Check and tighten (if necessary) each fastener outside the tractor, especially the fastening nut for the front and rear wheels.
3. Check the level of the engine oil pan, radiator, fuel tank, hydraulic steering oil tank and hydraulic lifter and battery. Refill if necessary. Before checking the oil level of engine oil pan, the tractor should be parked on a flat surface and the engine cool.
4. Fill lubricating grease according to Maintenance Table 4-1.
5. Check the tire pressure and refill as needed.
6. Check if the tractor has any air, oil or water leakage. If any leakage is found, have it repaired immediately.
7. Maintain the diesel engine according to the daily-shift technical maintenance guidelines specified in the diesel engine operation and maintenance manual.

4.1.2 Technical Maintenance for Every 50 Work Hours

1. Perform all the requirements of the technical maintenance per shift.
2. Check the air filter and remove the dust.
3. Check the tightness of the fan belt. When pressing the belt, it should deflect 15 – 20 mm. (0.6 - 0.8 in.).
Adjust if necessary.
4. The terminals on the battery should be coated with grease to prevent corrosion.
5. Check and adjust the free play of main clutch and brake pedals.
6. Open the fuel/air separator drain screw and the air vent screw and release any deposited water and impurities.
7. Maintain the engine according to the level 1 maintenance requirements specified in the engine manual.

Maintenance Instructions

4.1.3 Technical Maintenance for Every 250 Work Hours

1. Perform all technical maintenance required after 50 work hours.
2. Lubricate all grease fittings according to Table 4-1.
3. Change the engine oil and the oil filter.
4. Clean the air filter and replace the air filter element.
5. Clean the oil filter of the lifter, and replace the filter element, if necessary.
6. Maintain the diesel engine according to the requirement of level 2 technical maintenance described in the diesel engine operation and maintenance manual.

4.1.4 Technical Maintenance for Every 500 Work Hours

1. Perform all technical maintenance required after every 250 work hours.
2. Change the filter core for the fuel air separator in the fuel injection pump.
3. Check the tightness of the toe-in of the front wheel and the front wheel bearing, and adjust the tightness if necessary. Replace the lubricating oil inside the front wheel hubs.
4. Check the angle of the steering wheel during idle running, adjust the angle if necessary.
5. Change the engine oil filter.
6. Clean and maintain the hydraulic system filter.
7. Change the lube oil in the fuel injection pump casing.
8. Change the oil in the engine, the transmission, the rear axle, the transfer case, the front drive axle, the hydraulic lifter, and the steering gear.
9. Check and adjust the toe-in of the front wheels.
10. Adjust the steering wheel free play.
11. Drain, flush, and refill the cooling system with a 50/50 water/antifreeze mix.
12. Maintain the diesel engine according to the requirement of level 3 technical maintenance described in diesel engine operation and maintenance manual.

Maintenance Instructions

4.1.5 Technical Maintenance for Every 1000 Work Hours

1. Perform all technical maintenance required for every 500 work hours.
2. Change the hydraulic system oil.
3. Flush cooling system and radiator. Refill with a 50/50 water/anti-freeze mixture.
4. Clean the transmission case and change the oil in the transmission when the tractor is warm.
5. Clean the oil filter in the hydraulic system, and check the cleanliness of the hydraulic oil.
When necessary, drain the sump of the lifter case, clean it with solvent, and change the oil.
6. Check and adjust the fuel injection pressure of the diesel fuel injection pump.
7. Drain and flush the fuel tank and clean the filter in the fuel tank.
8. Inspect the hydraulic suspension mechanism and do maintenance if necessary, according to the work situation.
9. Carry out maintenance of the engine according to the level 4 maintenance requirements in the engine manual.

4.1.6 Technical Maintenance for Every 1600 Work Hours

1. Perform all technical maintenance required for every 1000 work hours.
2. Check engine to manufacturer's specifications.
3. Change the lube oil in the front drive axle central drive the final drive.
4. Check for bearing noise in the clutch and front end.
5. Check whether the clearance and contact points of the central transmission gears are normal.
Check the clearance and pre-loading condition of bearings, and adjust if necessary.
6. After completing the maintenance, assemble the whole machine and carry out a short-term trial run.
Check and adjust each mechanism as necessary.
7. Maintain the diesel engine according to the requirement of level 3 technical maintenance described in diesel engine operation and maintenance manual.

4.1.7 Special Technical Maintenance (Winter)

When the temperature is below freezing, along with the "Technical Maintenance per Shift", the following provisions should be strictly observed:

1. Select winter grade fuel and lubricating oil.
2. Check the strength of the coolant with a hygrometer. If necessary add anti-freeze to the cooling system as

Maintenance Instructions

required to protect against coolant freezing.

3. At the start of every shift start the engine in accordance with winter starting procedures.
4. In order to protect the tractor and ensure that the engine is easy to start, it is recommended that the tractor be parked in an insulated machine shed or garage during cold periods.

4.1.8 Technical Maintenance for Long-Term Storage

If the tractor is going to be kept in storage less than 1 month, and the time since the last oil change does not exceed 100 hours of running time, special technical maintenance is not required. If the tractor is going to be kept in storage longer than 1 month, special technical maintenance should be performed according to Section 5 – Storage as specified in this manual.



NOTE : After performing tractor maintenance and all cleaning and repair is completed, all the guard covers and plates should be reassembled. Otherwise, it can cause a potential safety hazard. All waste oil should be collected in a suitable container and disposed of properly.

4.2 Operations for Technical Maintenance

4.2.1 Tractor Maintenance

Table 4-1 82XTC Series Tractor Maintenance

Item	Maintenance/Repair Position	Operation Content	No. of Points	Maintenance Time (hour)	Remark
1	Engine water pump shaft	Fill lube grease	1		
2	Engine oil pan	Check oil level	1		
3	Engine air filter	Check and clean	1	Every shift	
4	Clutch/brake pedal axle	Check oil level	2	Every shift	Fill if necessary
5	Steering wheel thrust bearing	Check oil level	2	Every shift	
6	Rear wheel hub	Check oil level	2	Every shift	
7	Right/left lifter rod	Check oil level	2	Every shift	
8	Steering track rod ball pin	Check oil level	2	Every shift	
9	Front axle swing for four -wheel drive	Check oil level	2	Every shift	
10	Steering oil cylinder	Check oil level	2	Every shift	
11	Battery	Check oil level	1	Every shift	
12	Hydraulic steering oil tank	Check oil level	1	Every shift	Fill if necessary
13	Radiator	Check coolant level	1	Every shift	Add if necessary
14	Lifter	Check oil level	1	Every shift	Fill if necessary
15	Gear box-rear axle	Check oil level	1	Every shift	Fill if necessary
16	Fan V-belt	Check tension	1	50	
17	Engine oil pan	Change lube oil	1	200	

Maintenance Instructions

18	Engine oil filter	Change oil filter	1	200	
19	Engine air filter	Change air filter	1	200	
20	Air separator for diesel fuel injection pump	Change filter core	1	200	Bleed
21	Hydraulic system oil filter	Wash or change filter core	1	200	
22	Front- drive axle end-transmission	Check oil level	2	400	Fill if necessary
23	Grease cup for four-wheel drive main pin	Fill lube grease	2	400	
24	Front -drive axle differential	Check oil level	2	400	Fill if necessary
25	Hydraulic steering oil pan	Change hydraulic oil	1	400	
26	Lifter	Change hydraulic oil	1	400	
27	Rear axle differential	Change lube oil	1	400	
28	Fuel tank	Maintain and clean	1	800	
29	Front- drive axle hubs	Change lube oil	2	800	
30	Front -drive axle differential	Change lube oil	1	800	
31	Radiator	Maintain and clean	1	800	Drain, flush and fill

4.3 Clutch Adjustment and Maintenance

4.3.1 Clutch and Operation System Adjustment

During clutch operation, owing to the wear of clutch friction discs and clutch plates, the clearance between the clutch plate and the clutch fingers will gradually decrease. (Normal clearance is 2–2.5 mm.). Sometimes the clutch fingers may contact the throwout bearing, eliminating clutch pedal free play, and the clutch will slip and the throwout bearing will stick. In this situation the clutch should be checked and adjusted.

4.3.1.1 Clutch Pedal Free Play Adjustment

Unfasten the lock nut (1) counterclockwise and rotate the clutch. The clutch pedal free travel is adjusted by the vertical rod assembly (2) and should be 35–40 mm. Make the clearance between the clutch fingers and the throwout bearing 2–2.5 mm., then lock the nut (1) tight.

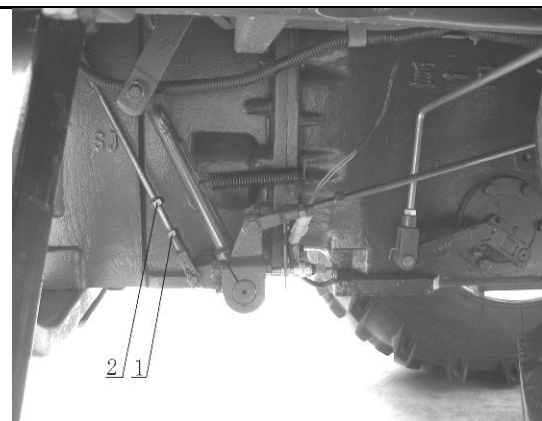


Figure 4-1 Adjustment on clutch pedal free path

1. Lock nut 2. Steering rod assembly

Maintenance Instructions

4.3.1.2 Clutch Fingers Adjustment

When the previous adjustment does not meet the requirements of 35–40 mm. of clutch pedal free travel, it means that the throwout bearing has moved backward and is sitting tight on the carrier. The following adjustment inside the clutch should be carried out:

1. Remove the inspection plate for the clutch on the transmission.
2. Loosen the nut and adjust the screw for the clutch fingers with a wrench.
3. Make the clearance between the three clutch fingers on top of the clutch cover and the throwout bearing 2–2.5 mm. The three clutch fingers of the clutch cover should be on the same plane .
Their position tolerance should be less than 0.2 mm.
4. Tighten the lock nut after adjustment.
5. Check the clutch pedal free play to ensure that the stroke is within the range of 35–40 mm.
6. Reinstall the inspection plate on the transmission.

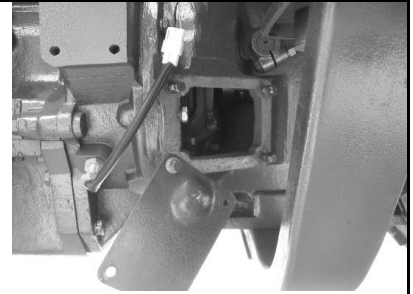


Figure 4-2 Inspection Plate Removal

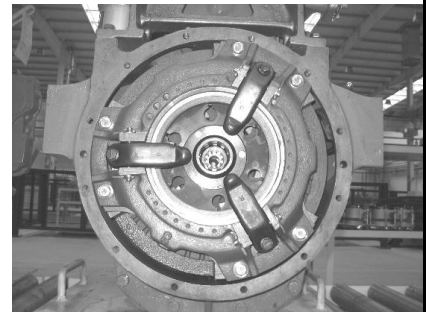


Figure 4-3. Release Rod Adjustment

4.3.1.3 Main Clutch Release Travel Adjustment

1. There should be suitable pedal travel from the main clutch release to the auxiliary clutch release, to avoid the auxiliary clutch releasing too early.
2. To obtain a suitable path, the clearance between the three adjusting screws (2) on the main pressure plate of the clutch and the three fingers (1) of the auxiliary friction discs pressure plate should be 1.7mm. Turn the adjusting screw and insert a feeler gauge to adjust the clearance between the bolt head and the finger of the auxiliary friction pressure plate so that it is 1.7 mm.
3. The lock nut should be tightened after adjustment.



Figure 4-4

Main Clutch Release Travel Adjustment

1. Lug 2. Set Screw 3. Lock nut

Maintenance Instructions

4.3.1.4 Tractor Overhaul Clutch Adjustment and Assembly

- There is a group of crescent shaped spacers between the clutch plate and clutch cover, as well as between the engine flywheel and auxiliary (PTO) clutch. During tractor overhaul, if the main/auxiliary friction discs are seriously worn, you can take out some of the adjustment gaskets to provide the disc spring enough pressure.
- When assembling the clutch, it can be sub-assembled on the mandrel, then inserted into the flywheel bearing hole, to make main/auxiliary clutch friction discs concentric to the spline hole, when mounting the transmission to the engine.

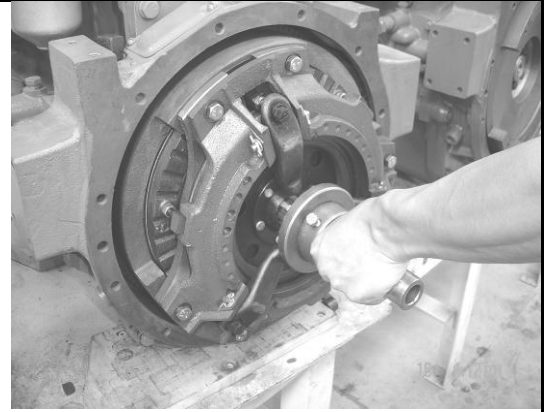


Figure 4-5 Tractor Overhaul Clutch Adjustment and Assembly

4.3.2 Clutch Maintenance

Check the clutch regularly to make sure that there is no oil leak in the split pin on the bottom of the transmission. If any leaks are found, check the rear oil seal of the engine crankshaft, the seal on the first shaft of the transmission, or the seal on the main power output shaft.

IMPORTANT ISSUES:

1. When using the clutch the clutch release should be rapid and complete, and the engagement should be soft and smooth, in order to avoid damage to the clutch.
2. To avoid clutch damage when the tractor is running, never rest your foot on the clutch pedal, or ride the clutch to reduce the tractor's running speed. Never engage the clutch suddenly to accelerate over a barrier or up a slope.
3. Make sure there is no oil on the surface of clutch friction discs. If oil is found, remove it with solvent and allow the discs to air dry, in order to avoid damage to the clutch.

4.4 Transmission Adjustment and Maintenance

The transmission usually needs no adjustment during operation. The following information should be noted during the operation and maintenance of the tractor.

Maintenance Instructions

4.4.1 Checking Transmission and Rear Axle Differential Oil Level

The transmission and the rear axle differential share the same oil sump.

The sump uses a transhydraulic oil. The position of the oil filling port on the lifter case is shown in Figure 4-6.

When checking the oil level, the tractor should be parked on a level surface.

After shutting down the engine, remove the oil level dipstick on the rear end of the rear axle, wipe it clean, then reinsert the dipstick.

If the oil level is lower than the low oil level line, lube oil should be added until the oil level is between the high and low level marks. Check the oil level 5 minutes after the engine has been shut down.

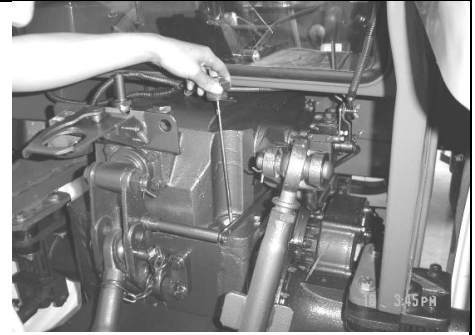


Figure 4-6 Transmission Oil Level

4.4.2 Changing Oil in the Transmission and Rear Axle Differential

When changing the lube oil in the transmission and rear axle differential the drain plug (1) in the transmission should be removed to completely drain the used oil. Replace the oil drain plug, and fill with fresh lube oil.

The position of oil drain port for the transmission is shown in Figure 4-7.

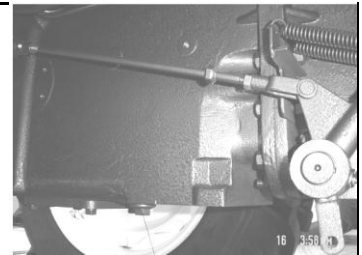


Figure 4-7

Transmission Oil Drain Port

1. Oil Drain Plug

4.4.3 Changing Transfer Case Lube Oil

When draining the oil, remove the drain plug (1) on the bottom of the transfer case and wipe off any metal chips adhered to the plug.

The location of the transfer case oil drain port is shown in Figure 4-8.

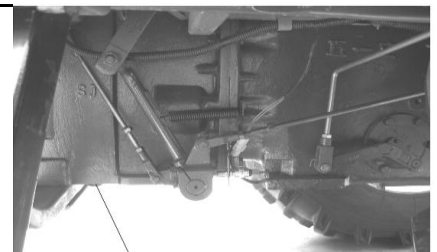


Figure 4-8 Transfer Case Lube Oil Drain

1. Oil Drain Plug

4.5 Rear Axle Adjustment and Maintenance

The rear axle consists of the central drive, the differential, the differential lock, the final drive, the right/left axle, the power output (PTO) shaft and the operation mechanism.

Maintenance Instructions

4.5.1 Rear Axle Maintenance

The main drive/driven spiral bevel gear pair for the center drive should be replaced as a matched set.

When applying the differential lock, the tractor should be driven in a straight line and steering wheel cannot be operated, otherwise, it will cause mechanical damage.



NOTE:

When operating the tractor in reverse, the operation handle for the power output shaft (PTO) should be put into neutral to avoid damage to the farm implement.

4.6 Brake Adjustment and Maintenance

There are two disc brake assemblies, which are symmetrically mounted on the right and left shafts of the rear axle, and connected with the brake operation mechanism.

4.6.1 Brake Pedal Free Play Adjustment

When the brake pad assembly and the brake drum are working correctly, the clearance between them is 1–1.4 mm., and the corresponding brake pedal free play is 90–120 mm.

When the brake pads are worn, the brake pedal free play will increase, resulting in poor braking.

When this is the case, the brake pedal free play must be adjusted.

Adjustment Method:

Loosen the lock nut (1) on the adjustment rod (2) and turn the rod.

The brake pedal free path will be decreased or increased depending on the direction you turn the rod.

The right and left pedal free path should be adjusted to be the same. The lock nut (1) should be tightened after adjustment.

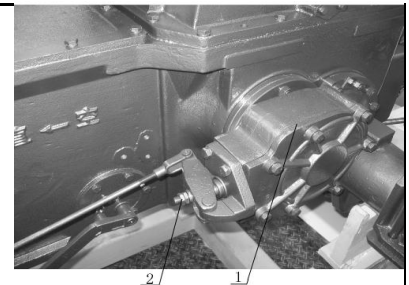


Figure 4-9 Brake Pedal Adjustment
1. Lock Nut 2. Adjustment Rod

4.6.2 Right/Left Braking Force Adjustment

The braking force of the right and left brakes should be consistent. Usually when emergency braking on a paved surface, the tire trace of the right and left drive wheels should be the same.

Adjustment Method: Loosen the two lock nuts on the brake rod, adjust, and retighten the two nuts.

Maintenance Instructions

4.6.3 Brake Use and Maintenance

If there is oil or dirt on the surface of the brake pads, it should be cleaned with solvent and re-assembled after it has dried. Regularly check the wear of the oil seals on the brake casing and cap. Change them, if necessary.



WARNING:

The right and left brake pedal free play should be adjusted to be equal. Otherwise, when emergency braking, the tractor could sway and cause a rollover or accident.

To be safe, test the brakes after any brake mechanism adjustment. The procedures is as follows:

1. Interlock the right and left brake pedals.
2. Drive the tractor on a dry, flat road.
3. Run the tractor in a straight line and use the emergency brake after releasing the main clutch.
4. Check the tire skid marks on the road surface.
5. If the skid marks of the right and left drive wheels on the road are consistent (in a straight line and parallel) then the brake adjustment is good..
6. Otherwise, readjust if necessary. If it is still not good even after repeated adjustment, the brakes should be thoroughly checked.

4.7 Steering Mechanism Adjustment and Maintenance

The tractor uses a separate hydraulic steering system consisting of a cycloid rotary valve, a full hydraulic steering gear, a steering oil cylinder, an oil tank, a track rod, a constant and overflow pump, and oil lines. Never adjust the steering during use. During maintenance, it should be noted that the constant and overflow pump, oil tank, steering oil cylinder and oil inlet/outlet of the steering gear, as well as

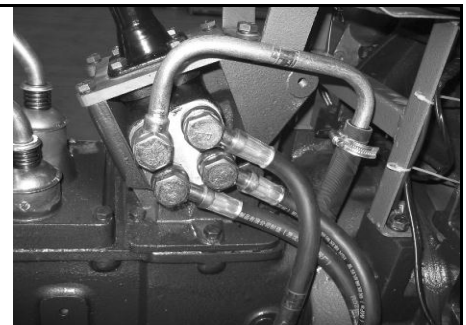


Figure 4-10 Steering Mechanism

the oil line joints should be checked and tightened, in order to avoid oil leaks.

If you encounter an oil leak, check the gaskets and make sure that none of the seal rings are damaged. Replace if necessary.

Maintenance Instructions

IMPORTANT ISSUES: The safety overflow pressure for the overflow valve on the constant current overflow pump has been set before delivery. It should not be removed and adjusted without Nortrac approval. After repair, loosen the two fittings on the oil cylinder and run the oil pump at a low speed to bleed any air from the oil, then tighten the fittings.

4.8 Four-Wheel Drive Front Axle Adjustment and Maintenance

The tractor front axle can be divided into three chambers: the central oil chamber, the left end drive oil chamber and the right end drive oil chamber.

4.8.1 Four-Wheel Drive Front Axle Central Oil Chamber Drain and Fill

The central oil chamber is in the middle of the front end of the tractor. The oil level should be checked regularly from the sight glass. When the oil level is low, oil should be added until the oil reaches the top line on the sight glass. When changing the engine oil, unscrew the oil drain plug from under the front axle and completely drain the used oil. Then, replace and tighten the oil drain plug. Put fresh lube oil into the oil filling port (1) and reinstall and tighten the fill plug.

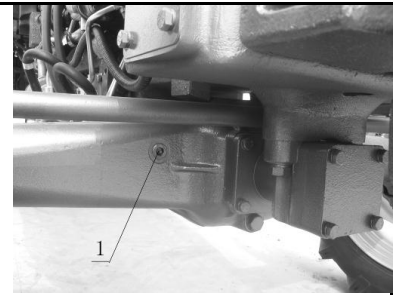


Figure 4-11 Front Axle Central Oil Chamber Adjustment and Maintenance
1. Oil Drain Plug

4.8.2 Four-Wheel Drive Front Axle Right/Left Hub Oil Sump Drain and Fill

When checking the oil level on the two front axle hubs, the tires should be turned to allow access to the oil drain and fill plugs on the hubs. The oil level should be near the top of the plug when the plug is at the horizontal centerline of the wheel. If not add oil to the top of the sump. When changing the oil, the front wheel should be turned to put the drain plug in the lowest position. Unscrew the plug, and drain the used oil. Then, roll the tire to align the plug and the front wheel horizontal center line. Fill with fresh oil and reinstall the fill plug.

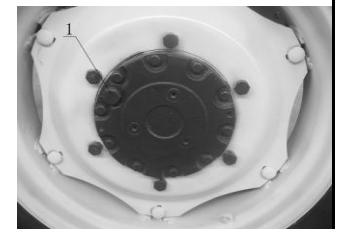


Figure 4-12 Right/Left Front Hub Oil Drain and Fill

4.9 Transfer Case Adjustment and Maintenance

The oil drain plug for the transfer case is on the side of transfer case. The used oil from the transfer case can be completely drained through this plug.

Maintenance Instructions

4.10 Tire Adjustment and Maintenance

Tires are one of the main consumables of the tractor, and should be carefully used and maintained in order to extend their working life as long as possible.

Improper operation will cause the tires to wear out too soon or be damaged during normal operations.

During operation, avoid going over obstacles at high speeds and emergency stopping or turning. When driving on a rough road, avoid tire slippage if at all possible.

During use, the tires should be kept clean of oil, acid, alkaline, chemical corrosives and out of direct sunlight as much as possible, in order to keep the rubber from aging and degrading. The front wheel alignment and front track also need regular checking, in order to avoid uneven tire wear. You can switch the right and left tires when wear is uneven.

4.10.1 Tire Inflation

Tire air pressure should be kept according to the regulations.

Four-Wheel Drive Type: Both the front and rear tires are inflated to 0.11–0.14MPa (16-20 psi).

When the drive wheel slips you need to shut down the tractor and troubleshoot immediately.

Do not run at high speed on uneven or rough roads. Operate the emergency brake as little as possible.

You can switch the right and left tires when the tire threads are unevenly worn.

The tires should be kept clean of fuel, lube oil or other dirt. When dirty, wash or brush them with water.

When the tractor is not going to be run for a long period, it should be jacked up to take pressure off of the front tires.



NOTE:

Excessively low or high tire pressure will shorten the service life of the tires. It will affect steering and control of the tractor, and could lead to hazardous situations.

Maintenance Instructions

4.11 Electrical System Adjustment and Maintenance

The tractor electrical system uses a 12V, single-wire, negative ground system. The system consists of the engine starting equipment, lights, instruments, and signal devices.

The engine starting equipment includes the starter, alternator, battery, voltage regulator, and ignition switch.

For the operation and maintenance of this equipment, refer to the diesel engine instruction manual.

The lighting and signal devices include the headlights, rear lights (with top rear lamp for cab), turn signals, and taillight set (turn signals, position and brake lights), combined instruments, speakers and fuses, etc.

The fans and controls for the cab HVAC system and the air conditioner compressor are also electrical.

4.11.1 Battery

The battery is in the front of the tractor, as shown in Figure 4-13.



Figure 4-13 Battery Position

4.11.2 Battery Maintenance

Normally the maintenance-free battery does not require any special maintenance. Water does not have to be added to maintain the level of electrolyte since the battery is sealed. You can observe the power levels from the view hole in the battery: Green = full power; Grey = lack of power; Dark = no power.

As part of the tractor's electrical system the battery requires some system level maintenance.

1. Check the status of the battery. Make sure the case is not cracked or leaking, and the battery is secured in place.
2. The battery should be charged under the following conditions:
 - The engine is slow to start and/or the lights are faint.
 - The inspection hole becomes grey. It should be replaced when the inspection hole becomes dark.
 - The battery is under voltage. Measure the terminal voltage when discharging. There is a problem with a 12V battery if the output voltage is lower than 10.5V.
3. When being stored, the battery should be charged monthly. The charging method is as follows: charge the battery by 0.1C20A (C20 is power capacity for 20hrs.). When the terminal voltage for the 12V battery reaches $14.4 \pm 0.05V$, you can continue charging for another 5hrs.

Maintenance Instructions

4. When removed from the tractor for any reason, the battery should be stored in a clean, dry and well-ventilated area with a temperature that is 32–104°F. The battery should be handled with care and stored right side up.
5. The power supply should be tightly connected to the battery terminals, in order to prevent the terminal from melting when the tractor is started. In order to avoid terminal oxidation or corrosive, the exterior of terminal should be coated with petroleum jelly or corrosion preventative spray.
6. Keep the exterior terminals of the battery clean.
7. Check the voltage regularly to make sure that the regulator is working properly. The voltage for the regulator is $14.2.1 \pm 0.2V$.

Check the generator output voltage regularly. The voltage should be $14.2 \pm 0.25V$.



NOTE:

1. When charging the battery, keep it in a ventilated area and far from open flames. When charging is over, shut off the power in order to avoid a fire or explosion.

4.11.3 Front Headlights

The position of combined headlights is shown in Figure 4-14.



Figure 4-14 Combined Front Head Lamp Position

4.11.4 Taillight Assembly

The position of the rear lamp and tail lamp assembly (steering, position and braking) is shown in Figure 4-15.



Figure 4-15 Taillight Assembly and Position

Maintenance Instructions

4.11.5 Headlight Illumination Intensity Distribution

As Figure 4-16 shows, the curve of the illumination intensity distribution is applicable to right-side traveling. If necessary, check and adjust the illumination intensity distribution for the headlights.

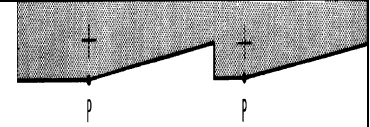


Figure 4-16

Head Lamp Illumination
Intensity Distribution

The procedure is as follows:

1. Check the tire pressure and make sure that it meet the requirements.
2. Place the (empty-load) tractor on a level plane, facing a smooth wall.
3. Place two “+” signs on the wall corresponding to head lamp central line.
 - Turn on the low beam light switch when the tractor is at distance of 5m from the wall.
 - The reference point (P-P) is located at 5cm under the “Cross” mark on the wall.
 - Turn the adjusting nut of the headlight to regulate its distribution curve.

4.11.6 Top Lights

There are four top lights on the cab, which are located on the front upper and rear upper parts of the cab.

The cab front top lights are shown in Figure 4-17; the cab rear top lights are shown as Figure 4-18.



Figure 4-17 Front Top Lights



Figure 4-18 Rear Top Light

It is possible to turn on the left and right top lights according to the requirement of work.

4.11.7 Fuse Box

There are strip fuses in the fuse box.
The working current for each circuit and its protected electric devices are shown in Table 4-2. When there are electric problems, First check the fuse box.
If the fuse is broken, take a replacement fuse from the circuit board (brass wire replacement not allowed) and replace it in order to ensure the safety of the electric element.



Fig.4-19 Fuse Box

Maintenance Instructions

Table 4-2 The Working Current in Each Circuit and Its Protecting Electric Appliance

Position	I	II	III	IV	V	VI	VII	VIII	IX	X
Fuse Rating (A)	10	10	30	10	10	15	10	20	30	15
Electric Components Being Protectedn	Brake light and horn	Direction light	Warm air blower and A/C	Head light on low beam	Head light on full beam	Working light, buzzer, Start relay, Master power relay	Position light	Top light	Pre-heating device	Tail light

4.12 Hydraulic Suspension System Maintenance

The tractor's lifter has been properly adjusted at the factory and there is no need for the user to do it again. But during use, the adjusted state can change, which will impact the normal operation of the tractor because of wear and loosening of the bar driver pair.

When the force-adjusted spring assembly is mounted, the regulating washer may be used for adjustment, which doesn't allow clearance on the spring after mounting.

4.12.1 Control Handle and Feedback Lever Adjustment

- Install the lifter on the tractor, connect the hoses and fill the hydraulic oil reservoir.
- Mount the suspension bar and hang a load of approximately 200-300 kg. at the lower suspension point. Place the control handle in the lowest position.
- Start the engine and set the throttle in the neutral position.

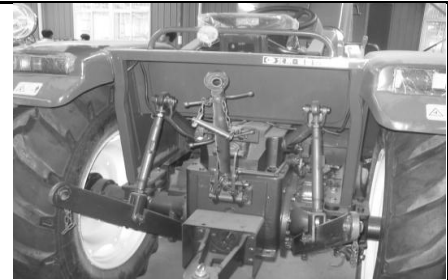


Fig.4-20

Hydraulic Suspension System

- Slowly move the control handle up and the lift arm and load will rise. When the handle reaches its peak, the angle should be 53° between the lift arm; the level is normal. If the angle between the lift arm and the level is less than 53°, it should be adjusted.
- When the angle between the lift arm and the level is less than 53°, the bolt (1) on the feedback lever can be used to increase the length of the feedback lever until it conforms to the requirements.
- Tighten the nut (2) after adjustment.

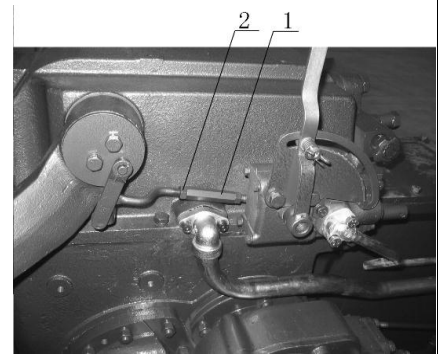


Fig 4-21 Feedback Lever Adjustment

1. Adjust the Bolt 2. Screw Down the Nut

Maintenance Instructions

4.12.2 Hydraulic System Use (only for a double acting oil cylinder type system)

When the control handle is pushed from the N position to the front position, the suspension system will start to rise. When reaching the deadline position, the control handle will move back automatically (i.e. back to the N position).

When the control handle is pushed from the N position to the reverse direction (at such time, the control lever is not in the rear position, the suspension system will descend. Once you release the control handle, it will go back to the N position, the descent will stop.

When the control handle is pushed from the N position to the lowest position, the suspension system stays in the “floating” state after dropping down to the final position.

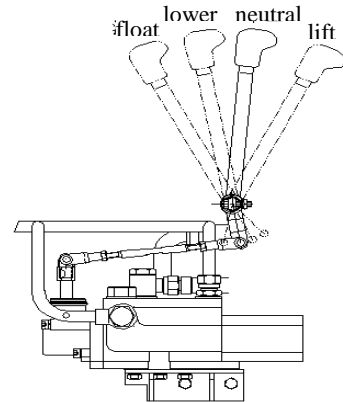


Figure 4-22 Hydraulic System Use

4.12.3 Lifter Height Limiter Procedure (for a double-acting oil cylinder system)

4.12.3.1 Lifter Height Limiter Function and Structure Diagram

You can control the lift height of farm implements by adjusting the position of the limiter (see adjustment procedure). Refer to the Figure 4-23 and make any adjustments as per the procedures described, to prevent breakage of the PTO shaft caused by the farm implement being lifted too high.

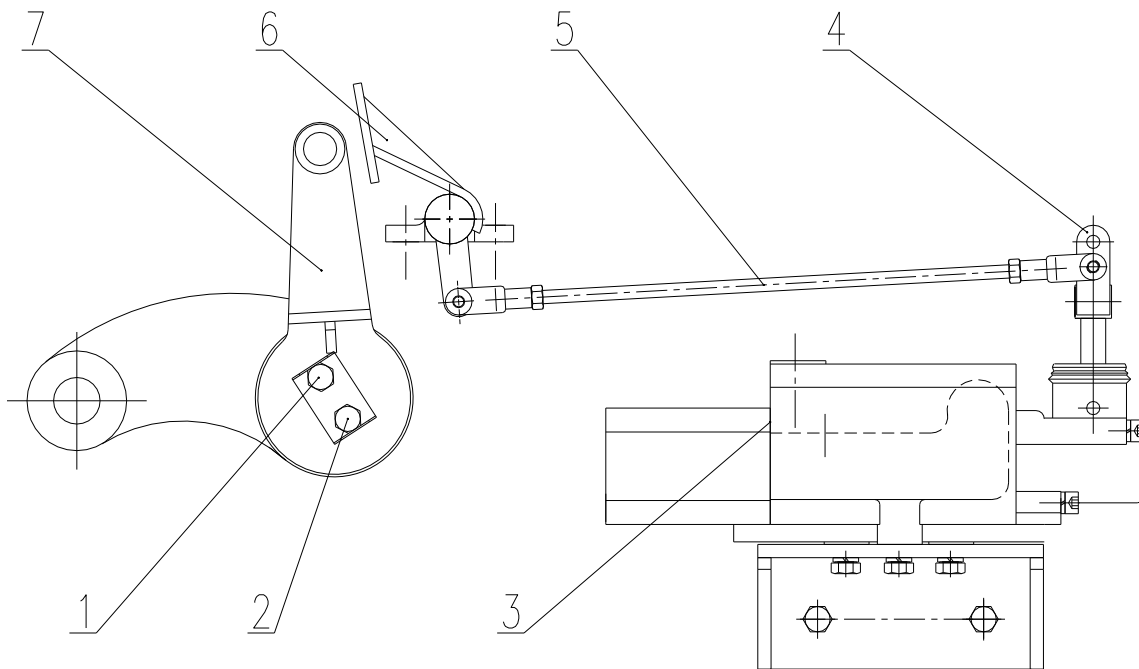


Fig 4-23 Lifter Height Limiter

1. Nuts (1) 2. Nuts (2) 3. Distributor 4. Control System
5. Feedback Lever 6. Height Limiter Feedback Lever Parts 7. Push Board

Maintenance Instructions

4.12.3.2 Height Limiter Adjustment Method and Requirements

- Shown above, you can control the height adjustment by adjusting the limit push board on the right side of lift shaft. Remove the nuts (1 and 2). The more the limit push board is adjusted counter-clockwise the higher the adjustment. Adjusting clockwise will lower it.
- Farm implements must be raised up when turning while doing field operations. It is required that the farm implement has a ground clearance of 150–250 mm. after lifting. This can be achieved through setting the length of the limit push board.
- When making adjustments for long distance operations or road transportation: adjust the position of the limit push board; the farm implement's lift height must have over 250 mm of ground clearance.
- Tighten the fixture parts after adjustment.

IMPORTANT ISSUES: When adjusting the distance between the position clamp ring block and the position valve, the adjustment of both the oil cylinders should be maintained in conformity with a tolerance of 0–0.5 mm. This will prevent damage on the farm implement parts.

4.12.3.3 Hydraulic Suspension System Oil Use and Maintenance

- The lifter cover is on the oil tank of the hydraulic suspension system. International standard hydraulic oil should be used according to the environment.
- Check every 50 hours to see if the oil level in the lifter cover is within the oil level stick range.
- Clean up the breather regularly. To do this, open it, take out the filter, clean it with solvent and blow it clean with compressed air. Replace it with a new filter element when it becomes difficult to clean or it is broken.



Fig. 4-24
Hydraulic Suspension System
Oil Use and Maintenance

Maintenance Instructions

4.12.3.5 Oil Filter Maintenance

After every 100 hrs. of tractor operation, check the hydraulic suspension system filter (1) and clean the filter element.

The maintenance method is to turn the cover at the back end of the oil filter, take out the filter element, clean it with solvent and blow it dry with compressed air.

Replace it with a new filter element when it is difficult to clean or it is broken.

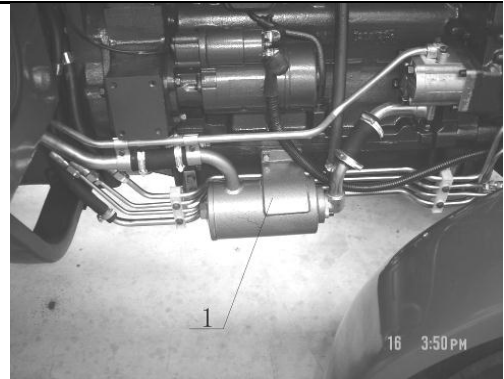


Fig.4-25 Hydraulic Oil Filter
1. Oil Filter

4.13 Air Filter Use and Maintenance

The interval for air filter maintenance should be based on the dust conditions in which the tractor operates. When the dust is heavy, service is recommended every 8 hrs.

When the air filter is blocked, a visual alarm on the filter housing turns red, and the air filter must be serviced.

Every day, or when refueling, check the air filter to ensure that all of the joints between the air filter and engine are well sealed, including all of the hose joints and the air filter housing.

When replacing the filter element, remove the wing nut and washer and carefully remove the element from the housing. Take care to prevent dust from falling into the filter housing. Use a clean, moist cloth to wipe the inside of the filter housing and the used safety filter element surface prior to reinstalling the filter element. Do not use compressed air to clean up the filter housing.

Repair any holes immediately and log the repair into the machine service and maintenance record.

Dispose of any damaged filters and replace with a new filter. Use the cover, washer and wing nut to tighten it down. Ensure that the filter rubber washer is mounted between the wing nut and filter element, and that the intake resistor is installed. Ensure that the end cover position and seat are aligned prior to putting on the end cover and fastening the clamp ring or wing nut.



Fig. 4-26 Air Filter

IMPORANT ISSUES:

1. The proper use and maintenance of the air filter is vital to the service life of the engine. It must be kept clean.
2. Never rinse the filter element with water or solvent as this can damage the filter element.

Storage

5. Storage

When the tractor is going to be out of use for an extended period of time (more than one month) it should be kept in a proper storage building. The storage facility should provide protection from the elements so as to keep the tractor clean and prevent rust and corrosion.

Before storing the tractor it must undergo a thorough cleaning and adjustment and tightening of various parts, subject to the technical maintenance requirements based on the duty hours, so that the tractor remains in good technical condition.

IMPORTANT ISSUES: During long periods of non-use it is very important to preserve and maintain the tractor. If special steps are not taken, the life of the tractor could be shortened and parts could deteriorate.

5.1 Tractor Storage - Causes of Damage

- **Rust:** During the storage period, dust and moisture in the air get into the tractor. This can cause contamination and rusting of the components. When pistons, valves, bearings and gears stay in one place for an extended period of time, they lose lubricant film protection, which produces rust and causes parts to stick and seize up.
- **Aging:** Some components are made of with rubber and plastic parts, which will age and deteriorate, getting brittle and rotting, under the ultraviolet rays in sunlight.
- **Deformation:** Components such as drive belts and tires may become distorted in shape if left in the same place for too long.
- **Others:** Electrical parts are affected by damp conditions, and the battery can discharge over time.

5.2 Tractor Storage

- Prior to storage inspect the tractor and its surroundings to ensure that the tractor can be stored safely. The external surface of the tractor should be cleaned.
- Remove the battery, coat the terminals posts with petroleum jelly, and keep it in dark, well-ventilated room with a consistent moderate temperature.
- Drain the engine oil while it is hot and fill with new engine oil. Run the engine for 10 minutes at idle to allow the new engine oil to adhere to the surfaces of all the moving parts evenly.
- Add lubricant to all the various lubrication points.
- Coat the electrical contacts, connectors and all unpainted metal part surfaces with anti-corrosion spray.

Storage

- Loosen the fan belt on the engine and remove it if necessary. Wrap the belt(s) securely and spray the pulley groove with a rust-proof agent. If possible, paint over all chips in the paint and cover non-painted metal parts with a rust inhibitor.
- Drain diesel fuel from the fuel tank or add diesel fuel conditioner to the fuel tank.
- Seal any engine opening such as intakes/outlets with protective material to prevent foreign matter, dust, and moisture from getting in.
- Place all control handles in the neutral position (including electrical system switches and the parking brake).
- If possible, prop the tractor on blocks so that the tires are free of weight. Check the tire pressure on a regular basis.
- The tractor should be parked in a dry, well ventilated area. If such an area is unavailable, cover the tractor with a waterproof covering. Never store the tractor around flammables or corrosive materials.
- Any parts removed from the tractor should be cleaned, packed and stored in a dry place.

5.3 Tractor Storage Maintenance

- Check on the tractor and its parts at least once a month to see whether there is any rust, corrosion, aging, or distortion happening. Immediately make any necessary repairs.
- Start the tractor twice a month and allow the engine to run. This will prevent interior rust.
- If possible, drive the tractor once every three months at low speed for 20-30 minutes. This is a great way to see how the tractor is doing in storage.
- Clean the dust off the top of the battery with a dry cloth, and check the charge level. The battery can go dead even when not in use. Recharge the battery once a month.
- When transporting the tractor long distances by train, truck, or trailer the gears should not be engaged. Transporting the tractor with the gears engaged, will move parts such as the gears, bearings, crankshaft and pistons, which can rub without lubricant and cause damage.

IMPORTANT ISSUES: If you cannot carry out the anti-rust treatment and the tractor needs to be out of use for several months or longer, at a minimum, replace the machine oil and oil filter. Start the tractor once every month and run the tractor at low speed for 20–23 min. at a minimum. Check to make sure everything is operating properly and keep the tractor clean to limit the amount of corrosion that could result from dust and wet conditions.

Storage

5.4 Removing Tractor from Storage

- Remove any grease used for anti-rusting.
- Reopen the various sealed up nozzles and clean the tractor.
- Check coolant, machine oil, and diesel fuel and lubricate all of the lubrication points according to the provisions.
- Remove any anti-rust agent in the belt grooves and reinstalls and/or adjust the belts.
(See: Engine Instruction for Use and Maintenance)
- Reinstall the battery and check the terminals.
- Check that all of the circuits, hoses and lines are properly connected.
- Check air pressure in tires.

NOTE: Please refer to the “Engine Instruction for Use and Maintenance” for details on engine storage and removing tractor from storage.

6. Transportation

If the tractor is to be driven by the owner, local traffic regulations should be strictly observed with at least 180 feet of distance maintained between vehicles. If the tractor is being transported, the following procedures should be followed:

1. A smooth, level spot should be selected for loading and unloading the tractor. A special unloading platform should be used if one is available.
2. Have one helper available for guiding and make sure the area is clear of everyone else.
3. After loading, the lift should be placed at the lowest position, the hand brake set, the reverse gear engaged, the ignition switch turned off, and the key taken out.
4. The front and rear tires should be fixed in place with straps in a figure 8 pattern. Both front and rear tires should be blocked and the rear axle secured with straps.
5. The tractor should be pulled inside an enclosed trailer or moved to the center of a flatbed trailer as far as possible and the rear view mirror may be taken down when necessary.
6. When tunnels and bridges are encountered, full attention must be paid to the load height, and speed should be adjusted for road safety.
7. While unloading, the hand brake should be released first. The drive gear should then be engaged and the tractor should be unloaded slowly and carefully at the lowest tractor speed.

Technical Specifications

7. Technical Specifications

7.1 Four Wheel Drive Tractor Technical Specifications

Table 7-1 Technical Specifications for NorTrac 82XTC Tractor

Item		Unit	Technical Parameters	
			TD824/TD904	
Type		—	Wheeled 4x4	
Nominal traction power		kN	19/21.3	
Maximum power of the PTO shaft		kW	54.3/59.4	
Outside size	Length (incl. rear suspension)	mm	4530(incl. front counterweight)	
	Width (outside tire)	mm	2050	
	Height (up to the top of muffler)	mm	2810	
Wheelbase		mm	2195/2366	
Tread	Front wheel	mm	1610.1950(out of the factory 1610/1680)	
	Rear wheel	mm	1620.2020(out of the factory 1620)	
Ground clearance	Min. ground clearance	mm	405(down side of front drive axle)	
	Agricultural interval	mm	420	
Turning circle radius	When the single sided brake is used	m	4.2±0.3	
	When the single sided brake is not used	m	4.9±0.3	
Structural mass	Model with cab	kg	3850	
	Model without cab		3600	
Least used mass	Model with cab	kg	4200	
	Model without cab		3900	
Mass distribution	Front shaft	With the cab	1690	
		Without the cab	1560	
	Rear shaft	With the cab	2510	
		Without the cab	2340	
Counterweight	Front counterweight (option)	kg	242 or 310 or 440	
	Rear counterweight (option)	kg	320 or 480	
Transmission system	Clutch		—	Single plate, dry type, double action clutch
	Gearbox		—	Combined 4x(2+1),8 drive gears. 4 reverse gears.clamping gear for option, or shuttle shifting: 4x(2+1)x2; 16 drive gears.8 reverse gears.master and auxiliary gear shifting, spur gear meshing bushing shifting
	Rear axle	Central transmission	—	Spiral bevel gear
		Differential	—	4 planet bevel gears
Differential lock		—	Spline bushing	

Technical Specifications

	Item		Unit	Technical Parameters
				TD824/TD904
		Final transmission, rear	—	Single planet bevel gear, outer mounted at both sides of rear axle
	Front drive axle	Transmission shaft	—	Central transmission shaft
		Central transmission, front	—	Spiral bevel gear
		Front differential	—	2 planet bevel gears
		Final transmission, front	—	Mono-planet gearing
Running gears and undercarriages	Frame assembly		—	Frameless
	Front suspension		—	
	Front shaft		—	
	Tire pressure	Front wheel	kPa	118.137
		Rear wheel	kPa	118.137
	Tires Specification	Standard: Front/rear wheels	—	11.2-24/16.9-34
Options: Front/rear wheels		—	11.2-24/18.4-30 12.4-24/16.9-34	
Steering system	Mode		—	Front wheel steering
	Steering gear		—	Static hydraulic steering
Brake system	Auxiliary brake		—	Static hydraulic pressure, disc, wet
	Parking brake		—	Independent Hand brake
	Trailer brake		—	Air-brake, air-cut brake
	Mode of hydraulic system		—	Open, semi-partition or separate
	Hydraulic oil pump		—	CB-F20/CB-F25
	Distributor		—	Lubricate
	Oil cylinder	Diameter x stroke	mm	110×128(single action)/110×128 (double actions)
		Form	—	Single action (semi-partition)/double actions (separate)
Suspension system		mm	Rear, three points suspension, Cat. II Upper suspension point: Joint hole x width: $\phi 25.2 \times 51$ Bottom suspension point: Joint hole x width: $\phi 28.7 \times 45$	
Working device	Plough depth adjusting modes		—	Common hoister: press adjustable, gear position regulated, force position mixed adjustable and floating controlled. Or force hoister: height adjustable, floating controlled
	Max. lifting power (610mm behind the suspension point)		kN	≥ 15 (semi-partition) Or ≥ 25 (separate)

Technical Specifications

Item		Unit	Technical Parameters		
			TD824/TD904		
Opening pressure of the system safety valve		Mpa	17.5-18.0		
Hydraulic power take-off	Form	—	Simple hydraulic power take-off or multiple-direction valve		
	Amount	—	1(Simple hydraulic power take-off) /1pair or 2 pairs (multiple-direction valve)		
	Specification	—	M18×1.5		
Power take-off shaft	Form		—	Independent rear-mounted	
	Specification		—	φ35.6 rectangle spline shaft(optional forφ38.8 teethed rectangle spline shaft orφ35.21 teethed involute spline shaft)	
	Rotate speed		r/min	540/1000(optional for760/1000,540/760)	
Traction and towing devices	Traction device	Form	—	Swing rod	
		Ground height	mm	367	
	Towing device		—	U-pothook	
Cab		—	Option for: simple comfort with warm air blower or with fan or A/C		
Safety stand		—	Double columns (model without cab), optional		
Pilot seat		—	Mechanically floating, PVC coating, height, front/rear and backrest adjustable		
Electric appliance instrument system	Electrical system mode		V	12 volts, negative earth, twin-wire	
	Generator	Type	—	Refer to the Engine Instruction for Application	
		Voltage	V	14	
		Power	kW	0.65/0.75	
	Regulator	Type	—	Refer to the Engine Instruction for Application	
		Regulated voltage	V	14	
	Generator start-up	Type	—	Refer to the Engine Instruction for Application	
		Voltage	V	12	
		Power	kW	3.7	
	Battery	Type	—	6-QW-120	
		Voltage	V	12	
		Capacity	A·h	120	
		Amount	—	1	
	Lighting and signal device	Head lamp	V W	12V.55/60W, combined	
		Front direction indicator	V W	12V.21W.2pcs	
Rear combined lamps		W	Rear parking light 5W; L/R direction indicator: 21W; brake light: 21W; reflector (red): 2 pcs .for each		

Technical Specifications

Item	Unit	Technical Parameters	
		TD824/TD904	
Watch and warning device	Rear working lamp	V W	12V.35W.2pcs
	Trailer plug	—	7 hole trailer plug, 1pc.
	Combination instrument	—	Rev. meter, water temp. meter, oil pressure gauge, fuel meter, one piece.
	Warning device	—	Instrument alarm indicator. Air filter clog warning sensor, brake level alarm, brake failure (air-brake model optional), L/R direction indicator, low beam indicator, charge indicator, preheating indicator, position indicator, parking brake indicator, signal light and device. Brake light, L/R direction light, front/rear position light, reflector, Safety warning symbols
Perfusion volume capacity	Radiator	L	14
	Fuel tank	L	145
	Engine oil pan	L	17
	Air cleaner	L	Add to the level as needed
	Oil, Hydraulic pressure steering	L	2.5
	Oil, Brake	L	0.6
	Oil, Transmission system	L	38
	Hoister oil	L	17
	Central transmission, front drive axle	L	6.1
Final transmission, front drive axle	L	1.2.each side.	

Note: For the notes with 1), the parameters in front of the parenthesis refer to the general parameters; when they appear after the parenthesis, they refer to factory supplied.

Table 7-2 Technical Specifications for Staple Products, NORTRAC-TD series

Item	Unit	Technical parameters
Type	—	1004D-4TARTLovel power
Discharge standard	—	EPATier、EuroStageA
Connection mode of Engine with gearbox	—	Straight link
Type	—	Air intercooler, vertical aligned, 4 strokes
Number of cylinders	—	4
Cylinder diameter x stroke	mm	100×127
Nominal power	kW	60.3/66.2
Nominal power	KW r/min	(69/2200)/ (74/2200)
Nominal rotate speed	r/min	2200
Rated fuel under working condition consumption rate	g/kW·h	≤260

Technical Specifications

Item	Unit	Technical parameters
Oil under working condition consumption rate	g/kW ·h	≤ 2.1
Lubrication mode		Press mode
Startup mode		Electric starter with auxiliary pre-heater

8. Disassembly and Disposal

After the machine reaches the end of its service life, for your personal safety and the protection of the environment, please deliver it to the licensed company specialized in the disassembly and recycling of such products.

The tractor should be disassembled in a sequence, from top to bottom, outside to inside. In the case of large or heavy parts a hoist should be used. Please take the battery to a battery recycling company and collect all waste oil for proper treatment.



WARNING: The battery electrolyte is corrosive. Take precautions to ensure that it does not get in your eyes or on your skin or clothes. If this happens, clean the affected area immediately with water and seek immediate medical treatment.



IMPORTANT ISSUES: Battery acid and machine oil are hazardous wastes. They should be disposed of properly following local laws so as not to cause any damage to the environment.

Breaking down a scrapped tractor requires special tools and practical experience. A lack of either of these can cause serious injury and damage to the environment.



WARNING: When disassembling large or heavy objects (i.e., a tractor) a hoist must be used and care should be taken to ensure safety at all times.

9. Warranty Terms



LIMITED WARRANTY



4WD Diesel Tractor

NorTrac™ equipment is sold by NorTrac; a division of Northern Tool & Equipment Company, Inc. NorTrac will repair or replace, at its option, any part(s) thereof of the NorTrac™ 4WD diesel tractor or compact crawler / bulldozer that are shown to be defective in material and/or workmanship, under normal use during the applicable warranty period. There is a \$100.00 deductible on the labor per warranty repair. After the labor deductible, all warranty repairs and replacements will be made without charge for parts or labor at a pre-authorized service center. All parts replaced as a result of this limited warranty become the property of NorTrac and must be returned upon request. All parts replaced will become a portion of the whole and will be warranted for the duration of the original equipment warranty.

Length of Warranty

The limited warranty begins on the original date of purchase and extends to 24 months for consumer household use. For the commercial end user, the limited warranty continues for thirty (30) days (Commercial use is defined as all applications in which the equipment is used for income production purposes, business purposes, or used by any governmental agency).

To qualify for the limited warranty you must:

- Be the original purchaser of the equipment. The limited warranty is non-transferable.
- Provide proof of purchase.
- Have purchased the equipment in the United States from authorized representatives of NorTrac and/or Northern Tool & Equipment Company, Inc.

To obtain service you must:

Contact NorTrac's Warranty Administrator by calling 1-800-521-0438, to relay your concerns about the equipment and to receive authorization from the Warranty Administrator. Or mail a letter with detailed failure and contact information to the address listed at the bottom of this page.

After receiving authorization from NorTrac's Warranty Administrator and the address of the Preauthorized Service center, take the equipment to the service center during their regular business hours. Transportation costs are the responsibility of the equipment owner.

If you are not able to secure warranty service from the authorized service center or are not happy with the service, please contact NorTrac's Warranty Administrator by calling 1-800-521-0438.

Exclusions and Warranty Disclaimers:

This limited warranty applies to equipment used in its original form. Any unauthorized modifications or any incorporation or use of unsuitable attachments or parts will automatically void this limited warranty.

This limited warranty does not include parts affected or damaged by accident and/or collision, normal wear & tear (battery, belts, tires, clutch, etc.), fuel contamination, or from failure to follow the instructions contained in the User Manual for the equipment. The cost of normal maintenance of the equipment is the responsibility of the owner.

This limited warranty does not extend to use in applications for which the equipment was not designed or to damages resulting from misuse, abuse, or neglect.

Disclaimer of Consequential Damage:

Any implied warranty of merchantability or fitness for a particular purpose, to the extent that either may apply to any NorTrac™ tractor or compact crawler / bulldozer, shall be limited in duration to the periods of the express warranties shown above, and to the extent permitted by law any and all implied warranties are excluded. In no event will NorTrac or Northern Tool & Equipment Company, Inc. be liable for any loss of income, loss of time or use of the product, transportation, hiring of alternative services, commercial loss or any other incidental, consequential, or special damages and / or expenses. Some states do not allow limitations on how long an implied warranty lasts and / or do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusions and limitations may not apply to you. This limited warranty gives you specific legal rights which may vary from state to state.

NorTrac
Warranty Administrator - Warranty Information
2800 Southcross Drive West
PO Box 1219
Burnsville, MN 55337

NorTrac - Northern Tool & Equipment Co.

Sales: 800-521-0438
Customer Service: 800-521-0438
Fax: 952-707-0573
Website: <http://www.northerntool.com>
Plant Site: 2800 Southcross Drive West
P.O. Box 121
Burnsville, MN 55337
USA

Appendices

10. Appendices

10.1 Tractor Fuel, Oils and Solutions

Table 10-1 Oils and Solutions

Application location of oils and solutions	Oils and Solutions						
Fuel tank	Domestic standard	GB/T 252 compliant light diesel oil	Above 20°C No.10	(4~20°C) No.0	(-5~4°C) No.-10	(-14~-5°C) No.-20	(-29~-35°C) No.-35
	International standard	Adopt ASTM D-975 fuel oil. Under general air temperatures, use 2-D grade oil; when ambient temperatures are below 5°C, use 1-D grade oil. Fill the engine fuel and oil strictly following the instructions given in the accompanying documents.					
Engine sump	Domestic standard	<p>Diesel engine sump, injection pump and governor use CF-4 grade equivalent diesel engine oils (GB11122). Do not replace with common diesel engine oil. Fill the engine fuel and oil strictly following the instructions given in the accompanying documents.</p> <p>When ambient temperatures are within or above the range of -10°C~+50°C, use 20W-50 CF-4 diesel engine oil.</p> <p>When ambient temperatures are within the range of (-20°C ~+50°C), use 15w~40 CD diesel engine oil.</p> <p>When ambient temperatures are within the range of -25°C~+40°C, use 10W-40 CF-4 diesel engine oil.</p> <p>When ambient temperatures are within the range of -30°C~+40°C, use 5W-40 CF-4 diesel engine oil.</p>					
	International standard	Engine sump, injection pump, and governor use the oils with their viscosity grades compliant with SAE viscosity classification. Below -5°C, use SAE 10W oil; above -5°C, use all-season SAE 15W/40 multi-grade oil. Quality class should comply with API CD grade standard.					
Water radiator	Use a 50/50 water/antifreeze blend at all temperatures.						
Gearbox-rear axle, hydraulic	Domestic standard	N100D dual-purpose transmission/hydraulic oil. Implementing standard: Q/LWZ B119					

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lifter, and front drive axle	International standard	General purpose oil (including steering oil) may be used, such as MF1135 of Massey Ferguson, M2C 86A of Ford and J20A of John Deere. Can use MF1135 (Massey Ferguson), M2C 86A (Ford), or J20A (John Deere) general-purpose oil. (Steering fluid reservoir included).
Steering fluid reservoir	Domestic standard	L~HM32 wear-resistant hydraulic oil
Oil cup	Domestic standard	GB/T 7324 compliant general-purpose lithium base grease for automobile
	International standard	Use NLGI D-217 grease with a viscosity grade of 2
Braking system	Domestic standard	Triple-purpose hydraulic/transmission/brake oil. Implementing standard: Q/LWZ B119
	International standard	SAE 10W oil with quality class compliant with API CD grade standard can be used.
Windshield		Use for windshield washer. When air temperatures are under -10°C, use -45# antifreeze washer fluid (SH/T0521).

Hybrid use of oils of different brands and manufacturers is strictly forbidden so as to avoid affecting service performance of the machine.

On the tractors with heaters or air conditioning, antifreeze must be used in winter to avoid frost cracks in this equipment and in the engine.

10.2 Tightening Torque Table of Major Screws, Bolts and Nuts

Table 10-2 Tightening Torque Table of Major Screws, Bolts and Nuts

Name and Assembly Location	Thread Specification	Tightening Torque (N·m)	Ft. /Lbs.
Bolt connecting engine with gearbox.nut	M10	60~70	44~52
Bolt connecting engine with gearbox.nut	M12	90~110	66~81
Bolt connecting engine with gearbox.nut	M14	150~180	111~133
Bolt connecting engine with gearbox.nut	M16×1.5	200~260	148~192
Bolt connecting gearbox with rear axle	M12	90~110	66~81
Bolt connecting gearbox with rear axle	M16×1.5	200~260	148~192
Engine and clutch housing	M8	25~30	18~22
Fixing bolt of the large bevel gear	M14×1.5	160~200	118~148

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Name and Assembly Location	Thread Specification	Tightening Torque (N·m)	Ft. /Lbs.
Bolt joining the housing of drive shaft and that of rear axle	M14×1.5	160~200	118~148
Bolt joining the hub and web of driving wheel	M18×1.5	397~457	293~337
Bolt joining the hub and web of front wheel	M16×1.5	200~260	148~192
Bolting connecting the engine to the bracket	M16	182~245	134~181
Bolt joining the housing of lifter and that of rear axle	M12	95~110	70~81
Bolt joining the oil cylinder end and the housing of lifter	M18×1.5 (Old structure)	260~290	192~214
	M20×1.5 (New structure)	396~465	292~343
Bolt joining the force-adjusting base and the rear-axle housing	M12	90~110	66~81
Nuts of the left and rear steering arms	M14×1.5	140~205	103~151
Pin-nut fixing both ends of the steering oil cylinder	M18×1.5	300~330	221~243
Nut joining the steering wheel and the steering column	M16×1.5	130~150	96~111
Bolt joining the swing-pin base and the front bracket	M16	182~245	134~181

NOTE: When tightening the major bolts and nuts on the tractor, torque wrenches must be used.

10.3 Reinforced Seals

Table 10-3 Reinforced Seals

Installation Location	Specifications	Standard Code	Quantity
Transfer case bearing seat	FB30×52×7D	GB/T 9877.1	2
Bearing block for the input shaft of gear box	FB50×72×8D	GB/T 9877.1	2
Power output shaft	SG60×90×12	JB2600	2
Vertical shaft of steering knuckle	SD65×90×12	JB2600	8
Bearing block for the semi-axle housing	FB100×130×12D	GB/T 9877.1	4
Intermediate base for the front drive axle	FB30×52×7D	GB/T 9877.1	2
Front wheel hub on front drive axle	165×190×7	5137109	2
Semi-axle of the front drive axle	40×62×12	5136002	2
Drive fork shaft of the front drive axle	42×62×17	5133799	2
Front drive axle bevel pinion shaft	45×75×10	5135294	1
Kingpin hole of the front drive axle housing	56×70×7.5	5121471	2
Oil seal at the end of power output shaft	FB70×90×10D	GB/T 9877.1	2

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10.4 Tractor Roller Bearings

Table 10-4 Roller Bearings

Installation Position	Bearing Name	Model	Quantity	Bearings Standard
Bearing block for the input shaft of gear box	Single-row radial ball bearing	6310	1	GB/T 276
Rear end of the input shaft of gear box	Single-row self-aligning roller bearing	20209	1	Special
Front end of the intermediate shaft of auxiliary transmission	Single-row radial ball bearing	NUP1014	1	Special
Rear end of the intermediate shaft of auxiliary transmission	Single-row radial ball bearing	6408N	1	GB/T 276
Intermediate section of the power output shaft	Single-row radial ball bearing	6306	1	GB/T 276
Inner flank of rear drive shaft	Tapered roller bearing	30214	2	GB/T 297
Outer flank of rear drive shaft	Tapered roller bearing	30215	2	GB/T 297
Planetary gear shaft for rear final drive	Rolling needle	8×23.8	252	GB/T 309
Front end of power output shaft	Single-row radial ball bearing	6309	1	GB/T 276
Rear end of the power output shaft	Single-row radial ball bearing	6210	1	GB/T 276
Rear end of power output shaft	Single-row radial ball bearing	6310	1	GB/T 276
Front end of the power output shaft	Single-row radial ball bearing	6308	1	GB/T 276
Left to the differential	Tapered roller bearing	32216	1	GB/T 297
Left to the differential	Tapered roller bearing	30216	1	GB/T 297
Rear end of the small bevel gear shaft of rear axle	Tapered roller bearing	32311	1	GB/T 297
Middle end of the small bevel gear shaft of rear axle	Tapered roller bearing	30310	1	GB/T 297
Rear end of the output shaft of gear box	Single-row radial ball bearing	6211N	1	GB/T 276
Front end of the output shaft of gear box	Rolling needle bearing	K323920	1	JB/T7918
Front and rear ends of gearbox countershaft	Single-row radial ball bearing	6211	1	GB/T 276
Front and rear ends of gearbox countershaft	Single-row radial ball bearing	6210N	1	GB/T 276
Intermediate gear shaft of transfer case	Cylindrical roller bearing	42305E	2	GB/T 283
Rear end of drive shaft of transfer case	Single-row radial ball bearing	6306E	2	GB/T 276

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Installation Position	Bearing Name	Model	Quantity	Bearings Standard
Intermediate section of the front drive shaft	Single-row radial ball bearing	6006E	1	GB/T 276
Rear end of the small bevel gear shaft of front drive	Tapered roller bearing	32207	1	Special
Front end of the small bevel gear shaft of front drive	Tapered roller bearing	802048	1	Special
Differential of front drive	Tapered roller bearing	2007112E	2	GB/T 297
Intermediate section of the front drive shaft	Single-row radial ball bearing	6007	2	GB/T 297
Bearing for the front wheel hub	Tapered roller bearing	819310	4	Special
Planetary gear shaft of the front final drive	Rolling needle	5×23.8		GB/T 309
Inner flank of the steering knuckle	Tapered roller bearing	32209	2	GB/T 297
Outer flank of the steering knuckle	Tapered roller bearing	32307	2	GB/T 297
Kingpin of the steering knuckle	Thrust ball bearing with flat seat	51210	2	GB/T 301
Bearing block for the auxiliary clutch shaft	Angular contact ball bearing	7016AC	1	GB/T 292
Bearing block for the release shaft of main clutch	Angular contact ball bearing	996712	1	Hand tailor
Bearing block for the sleeve of steering column	Single-row radial ball bearing	6004	1	GB/T 276
At the bore of driving gear for the third shift of gear box	Rolling needle bearing	KK64×74×41	1	JB/T7918
At the bore of driven gear of the first shift of gear box	Rolling needle bearing	KK64×74×41	1	JB/T7918
At the bore of driven gear of the second shift of gear box	Rolling needle bearing	KK64×74×41	1	JB/T7918
At the bore of auxiliary driven gear at the rear end of gear box	Rolling needle bearing	KK55×65×43	1	JB/T7918
Front end of the power output driven shaft	Bearing	6210	1	GB/T276
Rear end of the power output driven shaft	Tapered roller bearing	7212E	2	GB/T297

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Installation Position	Bearing Name	Model	Quantity	Bearings Standard
Rear end of the power output driving dual gear	Tapered roller bearing	7210E	2	GB/T297

10.5 O-Ring Seals

Table 10-5 O-Ring Seals

Installation Position	Specification	Standard	Quantity
Distributor handle shaft	9.5×2.65G	GB/T3452.1	1
Distributor feedback shaft	9.5×2.65G	GB/T3452.1	1
Interlocking shaft	13.2×1.8G	GB/T3452.1	1
The lowering valve of distributor is blocked	16×1.8G	GB/T3452.1	1
Relief valve of the distributor	19×2.65G	GB/T3452.1	2
Relief valve of the distributor is blocked	11.8×2.65G	GB/T3452.1	1
Front cover of the main valve of distributor	19×2.65G	GB/T3452.1	1
Lowering valve of the distributor	19×2.65G	GB/T3452.1	1
Non-return valve of the distributor	19×2.65G	GB/T3452.1	2
The non-return valve of distributor is blocked	20×1.8G	GB/T3452.1	1
Screw plug of the brake pump	20×2.65G	GB/T3452.1	2
Oil return valve of the distributor	21.2×2.65G	GB/T3452.1	1
Inlet of the steering oil pump	19×2.65G	GB/T3452.1	1
Non-return valve of the distributor	25.7×2.65G	GB/T3452.1	1
Valve stem of the brake pump	25×3.55G	GB/T3452.1	2
Joint of the oil outlet pipe of brake pump	30×3.55G	GB/T3452.1	2
Lifting shaft of the lifter	54.5×5.3G.Old structure 56×3.55G.New structure 63×3.55G.New structure	GB/T3452.1	2
Lifter piston	100×5.3G	GB/T3452.1	1
Lifter cylinder end	103×3.55G.Old structure 132×3.55G.New structure	GB/T3452.1	1

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Installation Position	Specification	Standard	Quantity
Lifter cylinder body	118×3.55G	GB/T3452.1	1
Piston of the brake	260×3.55G	FT800.43.149	2
Piston of the brake	300×3.55G	FT800.43.150	2
Power output operating-handle shaft	17×1.8G	GB/T3452.1	1
Protective sleeve for the front drive axle	45×3.55G	GB/T3452.1	4
Operating shaft of the transfer case	17×1.8G	GB/T3452.1	2
Front drive axle bevel pinion shaft	31.5×1.8G	GB/T3452.1	1
Bearing block for the front drive semi-axle	80×2.62G	4966231	2
Rear base for the front drive axle	99.6×5.3G	GB/T3452.1	2
Front base for the front drive axle	52.6×3.55G	GB/T3452.1	1
Oil inlet joint of the distributor	12.5×2.65G	GB/T3452.1	1
Manual brake camshaft	15×2.65G	GB/T3452.1	2
Steering shaft	15×2.65G	GB/T3452.1	1
Elbow joint at the oil pump outlet	20×2.65G	GB/T3452.1	1
Fork shaft of the differential lock	20×2.65G	GB/T3452.1	1
Connecting plate at the oil pump inlet	21.2×2.65G	GB/T3452.1	1
Fork shaft base of the differential lock	30×2.65G	GB/T3452.1	1
Swing pin of the front axle	50×5.3G	GB/T3452.1	2
Elbow joint at the oil pump outlet	15×2.65G	GB/T3452.1	1
Connecting plate at the oil pump inlet	21.2×1.8G	GB/T3452.1	1
Where the oil suction pipe joint meets the lifter housing	26.5×2.65G	GB/T3452.1	1
Where the oil suction pipe joint meets the oil suction filter	32.5×2.65G	GB/T3452.1	1

Appendices

IMPORTANT ISSUES:

1. Before choosing the farm implements, you should refer to this detailed list and base your decision on the working conditions (requirements of soil resistance, agronomy and so on) of the area. Choose the categories of supporting implements and then consult the distributors.
2. According to the purchased model of the tractor (power capacity) in combination with the working conditions (requirements of soil resistance, agronomy and so on) of the working area, you should refer to the results of the consultations to determine the models of farm implements you need for suitable support. If the supporting equipment is not suitable, it will have an adverse impact.
3. Different working conditions (requirements of soil resistance, agronomy and so on) with the same working efficiency of the implement can give different results. Please calculate the working speed, working width etc. according to local working conditions.



Distributed by Northern Tool & Equipment Co., Inc.
Burnsville, MN 55306-6936
Made in China

82 HP On Line Spare Parts System

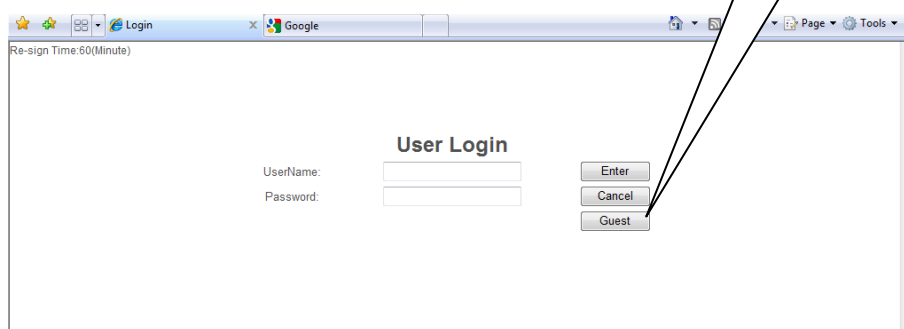
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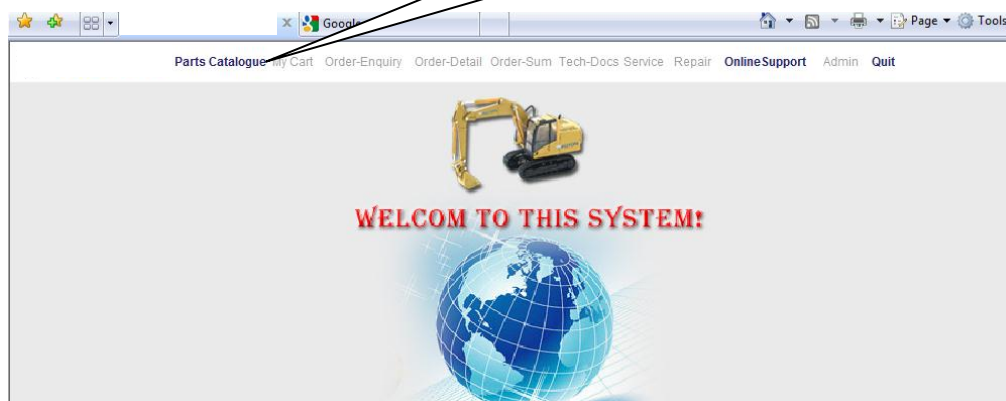
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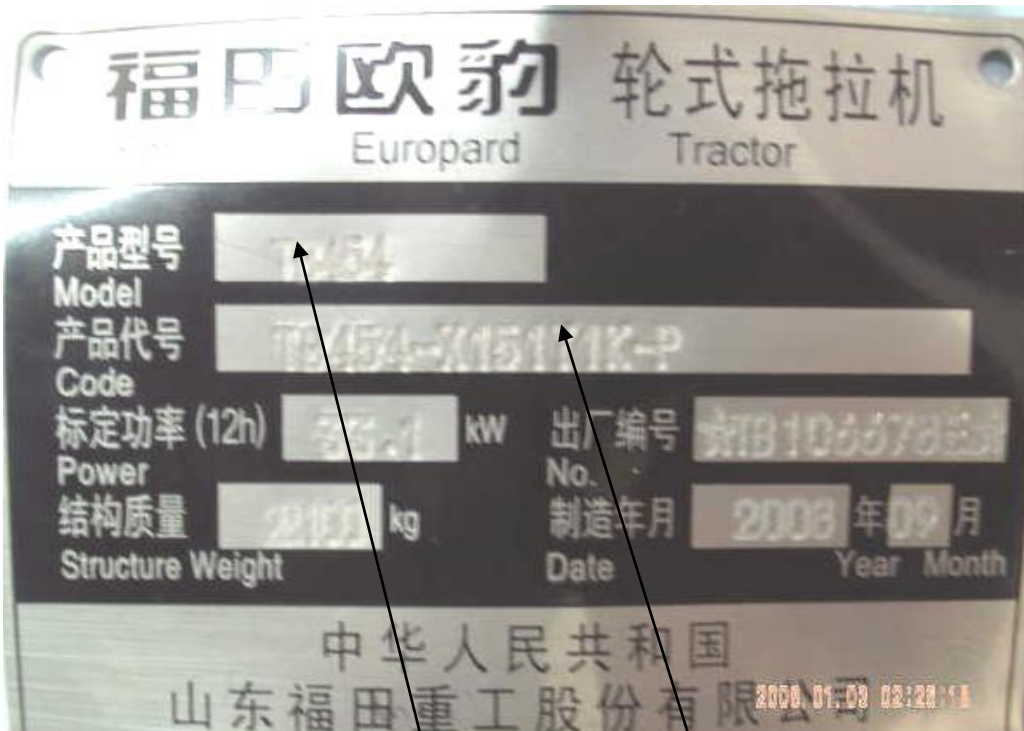


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Then search here

Parts Catalogue My Cart Order-Enquiry Order-Detail Order-Sum Tech-Docs Service Repair OnlineSupport Admin Quit

Product: ProductLine: Series: Product Model:

Part: Model Code: Part Number: Part Name: Searching Sequence:

Then you can find the parts catalog and diagram of the tractor:

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Parts Catalogue My Cart Order-Enquiry Order-Detail Order-Sum Tech-Docs Service Repair OnlineSupport Admin Quit

Product: ProductLine: Series: Product Model:

Part: Model Code: Part Number: Part Name: Searching Sequence:

- [-] TB40 Serials tractor
 - [-] TB454-X151Y1K tractor
 - [-] 10Xin Chai Engine
 - Cooling water pump and fan assembly
 - Crankshaft flywheel assembly
 - Cylinder head and gas exchanging syst
 - Cylinder head cover assembly
 - Engine Body assembly and accessory
 - Fuel supply system assembly
 - Oil filter, Starting motor and charging
 - Oil pump and oil pipe assembly
 - Oil sump assembly
 - Piston connecting rod assembly
 - Timing gear train assembly



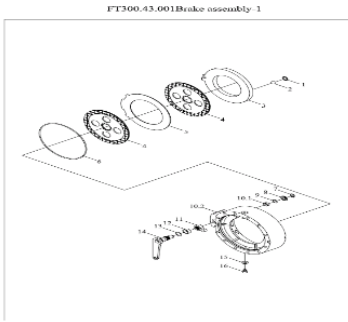
FEATURES Cabin with heater at option
Grammer seat at option
original Perkins engine at option as well.

SelectAll

Product: ProductLine: **Tractor Serie** Series: **TD80** Serials Product Model: **TD824-1F461D19K**

Part: Model Code: Part Number: Part Name: Searching Sequence: **A->Z** Search

- 42Transfer case driven assembly
- 42Transfer case housing assembly
- 43Braker assembly
 - 43Braker assembly-1
 - 43Braker assembly-2
 - 43Braker assembly-3
- 44Seat mounting assembly
- 45Floor mounting
 - 45Floor mounting-1
 - 45Floor mounting-2
- 46Safety frame assembly
- 47Engine hood locking device assembly
- 47Front wall fender assembly
- 47Hood lower tail plate mounting assembly



FEATURESCabin with heater at option
Grammer seat at option
original Perkins engine at option as well.

Put In Cart

Select All

Select	QTY	IndexID	DrawID	Name	Remark
<input type="checkbox"/>	1	9	GB/T3452.1	O-Ring18.0x2.65	
<input type="checkbox"/>	1	10	FT300.43.012	Left brake housing assembly	
<input type="checkbox"/>	1	10.1	FT300.43.114	Crank shaft bush	

FT300.43.001Brake assembly-1

