D180
(Tier 2)

CRAWLER DOZER

Workshop manual

Print No. 604.02.390.01 English

 THIS ALERT SYMBOL SIGNALS IMPORTANT MESSAGES INVOLVING YOUR SAFETY.

Read and heed carefully the safety instructions listed and follow the precautions recommended to avoid potential risks and to safeguard your health and your safety.

You will find this symbol in the text of this Manual referred to the following key words:

***WARNING* - Cautions directed to avoid improper repair interventions involving potential consequences for the safety of the personnel performing the repairs.**

***DANGER* - These warnings qualify specifically potential dangers for the safety of the operator or other persons directly or indirectly involved.**

IMPORTANT NOTICE

All maintenance and repair interventions explained in this Manual **must be performed exclusively by the Service Organisation of the Manufacturer**, observing strictly the instructions explained using, whenever necessary, the recommended specific tools.
Whoever performs the operations reported without following exactly the precautions is responsible on his own, for the damages that may result.

Neither the Factory nor any Organisations in its Distribution Network, including but not limited to national, regional or local distributors, are responsible for any liability arising from any damage resulting from defects caused by parts and/or components not approved by the Factory for use in maintaining and/or repairing products manufactured or merchandised by the Factory.
In any case, no warranty of any kind is made or shall be imposed with respect to products manufactured or merchandised by the Factory, when failures are caused by the use of parts and/or components not approved by the Factory.

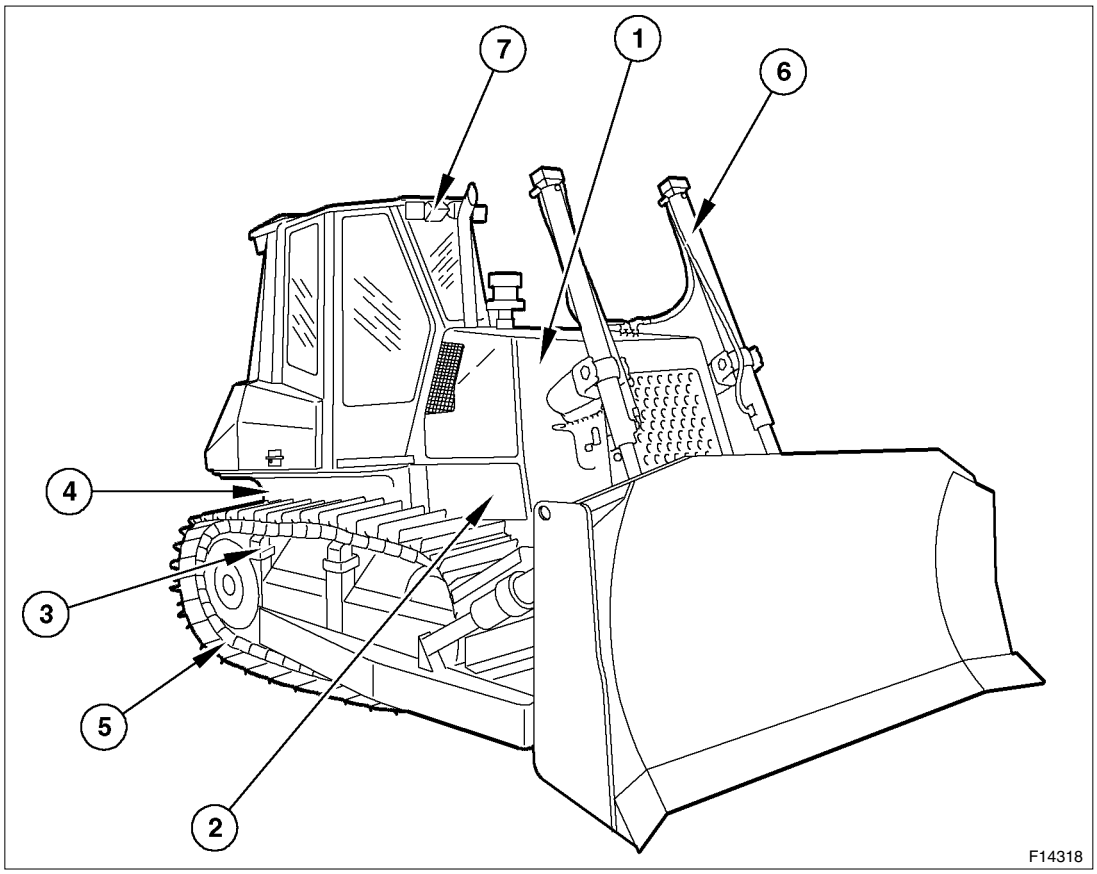
AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home or on the road, are caused by the failure of some individuals to follow simple and fundamental safety rules and precautions. For this reason MOST ACCIDENTS CAN BE PREVENTED by recognising the real cause and doing something aboiut it before the accident occurs.
Regardless of the care used in the design and construction of any type of equipment, there are many conditions that cannot be completely safeguarded against without interfering in the reasonable accessibility and efficient operation.
A carefull operator is the best insurance against an accident. The complete observance of one simple rule would prevent many serious accidents.
The rule is simple: never attempt to clean, lubricate or maintain a machine while it is in motion.

 **WARNING**

Prior to engaging in any maintenance, adjustment or repair operation on machines having hydraulically, mechanically, and/or cable controlled equipment (such as shovels, loaders, dozers, excavators etc.) be certain the equipment is lowered to the ground.
If it is necessary to have the equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the devices used for controlling the equipment.

SUMMARY



SECTION 0

GENERALITIES

TABLE OF CONTENTS

⚠ WARNING

Study carefully this Manual before starting, operating, maintaining, fuelling or servicing the machine.

Read and heed all safety rules before any intervention.

SAFETY RULES

- Do not allow unauthorised personnel to operate service or maintain this machine.

- Do not wear rings, wrist watches, jewellery, loose or hanging apparels, such as ties, torn clothing, scarves, unbuttoned or unzipped jackets that can catch on moving parts. Wear proper safety equipment as recommended for the job. Examples: hard hat, heavy gloves, ear protection, safety glasses or goggles, reflector vests, respirator. Consult your employer for specific safety equipment requirements.

- Keep operator's compartment, stepping points, grabrails and handles clear of foreign objects, oil, grease, mud or snow accumulation to minimise the danger of slipping or stumbling. Clean mud or grease from shoes before attempting to mount or operate the machine.

- Do not jump on or off the machine. Keep two hands and one foot, or two feet and one hand in contact with step grab rails and handles at all times.

- Do not use controls or hoses as hand holds when climbing on or off machine. Hoses and controls are movable and do not provide a solid support. Also, controls may be inadvertently moved causing accidental machine or equipment movement.

- Never attempt to operate the machine or its tools from any position other than seated in the operator's seat.

- Keep head, body, limbs, hands and feet inside operator's compartment at all times, to reduce exposure to hazards outside the operator's compartment.

- Be careful of slippery conditions on stepping points, hand rails, and on the ground. Wear safety boots or shoes that have a high slip resistant sole material.

- Do not leave the machine until it is completely stopped.

- Check the seat safety belt at least twice a year. If there are signs of wear or fraying or other signs of weakness that could lead to failure, replace it.

STARTING

- NEVER START NOR OPERATE AN UNSAFE MACHINE.

  Before operating a machine, always ensure that any unsafe condition has been satisfactorily remedied.

- Check brakes, steering and attachment controls before moving. Advise the proper maintenance authority of any malfunctioning part or system.

- Be sure all protective guards or panels are in place, and all safety devices provided are in place and in good operating conditions.

- Be sure exposed personnel in the area of operation are clear of the machine before moving it or its attachments. WALK COMPLETELY AROUND the machine before mounting. Sound horn.

- Before starting machine, check, adjust and lock the operator's seat for maximum comfort and control of the machine.

- Fasten your seat belt (when provided).

- Obey all flag signals and signs.

- Due to the presence on the machine of flammable fluids, never check or fill fuel reservoirs or batteries near open flames, smoking materials or sparks.

- REMEMBER THAT STARTING FLUID IS FLAMMABLE. Follow strictly the recommendations printed on containers and in the Operation and Maintenance Manual.

- DO NOT PUNCTURE OR BURN CONTAINERS.

- Containers must be stored in fresh, well ventilated places, out of reach of unauthorised persons. Follow strictly the instructions provided by the Manufacturer.

- Never use these products near open flames, smoking materials or sparks.

OPERATION

- Do not run the engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

- Roll Over Protective Structures are required on loaders, dozers, graders, excavators.

SAFETY RULES

NEVER OPERATE machines without ROPS.

- Make sure the Operator's compartment is free of foreign objects, especially if not firmly secured. Never use the machine to transport objects, unless proper securing points are provided.

- Check monitoring instruments at start-up and frequently during operations. in case the brake pressure gauge shows a pressure lower than the minimum operating pressure, stop immediately the machine .

- DO NOT CARRY RIDERS ON MACHINE

- Study and familiarise with escape routes alternate to normal exit routes.

- Seat belts are required by current regulations to be provided with Roll Over Protection Structures or cabs. Keep safety belts fastened around you during operation.

- For your personal protection, do not climb on or off machine while machine is in motion.

- Make sure that exposed persons in the area of operation are clear of the machine, before starting the engine and operating the equipment. Sound horn. Obey all indications provided by flags and signals.

- NEVER COAST the machine down grades and slopes with the transmission in neutral or neutralised.

  Choose and shift into the most appropriate gear to keep the speed required, thus preventing any loss of control.

- Do not operate machinery in a condition of extreme fatigue or illness. Be especially careful towards the end of working shift.

- Do not operate machine with brakes out of adjustment.

- Operate the machine at speeds slow enough to ensure complete control at all times.

- Travel slowly over rough terrain, on slopes or near drop-offs, in congested areas or on ice or slippery surfaces.

- When backing, always look to where the machine is to be moved. Be alert to the position of exposed personnel. DO NOT OPERATE if exposed personnel enter the immediate work area. STOP THE MACHINE.

- Maintain a safe distance from other machines. Provide sufficient clearance for ground and visibility conditions. Yield right-of-way to loaded machines.

- Maintain clear vision of areas of travel or work.

  Keep cab windows clean and repaired.

- When machines are operating in tandem, the pusher (rear) must be equipped with the appropriate deflectors to protect the unit in front from the air stream coming from the radiator.

- When pulling or towing through a cable or chain, do not start suddenly at full throttle; take-up slack carefully.

  Inspect carefully for flaws or troubles before using.

- Avoid kinking chains or cables. Do not pull through a kinked chain or cable to the high stresses and possibility of failure of the kinked area. Always wear heavy gloves when handling chains or cables.

- Be sure chains and cables are anchored and the anchor points are strong enough to handle the expected load. Keep exposed personnel clear of anchor points and cables or chains.

- DO NOT PULL UNLESS OPERATOR's COMPARTMENT OF MACHINES INVOLVED ARE PROPERLY GUARDED AGAINST POTENTIAL CABLE OR CHAIN BACKLASH.

- Be alert to soft ground conditions close to newly constructed walls. The fill material and weight of the machine may cause the wall collapse under the machine.

- In darkness, check area of operation carefully before moving in with machine. Use all lights provided. Do not move into area of restricted visibility.

- If engine has a tendency to stall for any reason under load or idle, report this for adjustment to proper maintenance authority immediately. Do not continue to operate machine, until condition has been corrected.

- On machines supplied with suction radiator fans, be sure to periodically check engine exhaust parts for leaks, as exhaust fumes are dangerous to the operator.

- In case of closed type cabs, always keep an opening with the outside, to ensure a constant air circulation.

- Operators must know thoroughly the performances of the machine they are operating. When working on slopes or near sudden level drops of the terrain, avoid areas where ground is loose or soft since rolling-over or loss of control of machine could result.

- Where noise exposure exceeds 90 dBA for 8 hours, wear approved ear protection.

- When counterweights are provided, do not work machine if they have been removed.

- Overtaking manoeuvres must be performed only when absolutely necessary and unavoidable. Beware of possible uneven terrains, poor visibility conditions, the presence of other machinery or persons out of sight.

- Operate the machine at a speed adequate to the working conditions in the site and slow enough to ensure complete control at all times.

- Never use the machine as a work platform or scaffolding, nor other inappropriate operations (i.e. pushing railway cars, trucks or other machines).

- Be alert of people in the operating area of the machine.

- When operating a machine, know in advance what clearances will be encountered, overhead doors, cables, pipes, bearing load limitations of ground, bridges, floors or ramps.

- When roading, find-out what conditions are likely to be encountered, clearances, traffic congestion, type of road surfacing, etc. Beware of fog, smoke or dust elements that obscure visibility.

- When crossing gullies or ditches, move at an angle with reduced speed after ensuring ground conditions will permit a safe traverse.

- Explore the working area to identify potential risks such as: slopes, overhangs, pits, demolition rubble, fires, ravines, ditches, soft terrain, heavy traffic, crowded parking areas, closed ambients. In such conditions, proceed with extreme care.

- Whenever possible, avoid going over obstacles such as rough terrain, rocks, logs highly irregular ground, steps, ditches, railroad tracks. When obstructions must be crossed, do so with extreme care at an angle, if possible. Reduce speed, shift-down. Ease up to the break over point, pass the balance point slowly on the obstruction and ease down on the other side.

- In steep down-hill operation, do not allow engine to overspeed. Select proper gear before starting down grade.

- Avoid side hill travel, whenever possible. Drive up and down the slope. Should the machine slipping sideways, turn it immediately downhill.

- The grade of slope you should attempt will be limited by factors such as condition of the ground, load being handled, type of machine, speed of machine and visibility.

- There is no substitute for good judgement when working on slopes.

- Avoid operating equipment too close to an overhang or high wall, either above or below the machine. Be on the look-out for caving edges, falling objects and slides. Beware of concealment by brush and undergrowth of these danger.

- When pushing-over trees, the machine must be equipped with proper overhead guarding. Never allow a machine to climb up on the root structure particularly while the tree is being felled. Use extreme care when pushing over any tree with dead branches.

- When pushing trees with dead limbs, proceed with extreme care. Avoid brush piles, logs or rocks.

- NEVER DRIVE OVER THEM or other surface irregularities that brake traction with the ground, especially when on slopes or near drop-offs.

- Be alert to avoid changes in traction conditions that could cause loss of control. DO NOT DRIVE on ice or frozen ground conditions when working the machine on steep slopes or near drop-offs.

- Working in virgin and rough terrains is characterised by the presence of all the perils and risks listed above. In these conditions, it is emphasised the danger represented by large tree limbs (possibly falling on the machine), large roots (acting as a leverage under the machine when uprooted causing the roll-over of the unit) etc..

STOPPING

- When the machine is stopped for whatever reason, follow the instructions of chapters "**Stopping the machine**" and "**Stopping the engine**" of the Operation and Maintenance Instruction Manual.

- Always remember to position the transmission drive control in neutral and engage the control lock to secure the machine.

- The parking brake is automatically set, when the transmission safety lever is lowered.

- NEVER LEAVE THE MACHINE UNATTENDED with the engine running.

- Always, before leaving the operator's seat and after making sure all people are clear of the machine, slowly lower the attachments or tools flat to the ground in a positive ground support position.

- Return the controls to rest position. Place the gearshift lever in neutral. Disconnect the master switch and extract the key.

- Park in a non- operating and no-traffic area or as instructed. Park on firm level ground if possible. Where not possible, position machine at a right angle to the slope, making sure there is no danger of uncontrolled sliding movements.

- If parking in traffic lanes cannot be avoided, provide appropriate flags, barriers, flares and signals as required. Also provide advance warning signals in the traffic lane of approaching traffic.

- Keep head, body, limbs, feet, fingers or hands away from bucket, blade or ripper when in raised position.

- Always disconnect the master switch before any intervention (i.e. cleaning, repairing, maintaining, refuelling etc.). Do the same when parking for prolonged periods of time to avoid accidental or unauthorised starting.

- Never lower attachments or tools other than seated in operator's seat. Sound horn. Make sure area near the attachment is clear. Lower the attachment slowly. DO NOT USE FLOAT POSITION of hydraulic system.

- Place master switch in **OFF**, securely block the machine and lock it every time you leave it unattended. Return keys to authorised security. Heed all shut-down operations of the Operation and Maintenance Instruction Manual are followed.

MAINTENANCE

GENERALITIES

- Before operating or performing any intervention on the machine:

  • read carefully all the rules contained by this Manual;

  • read and obey all safety related plates and instructions located on the machine.

- Do not allow unauthorised personnel to perform any maintenance operation. Do not perform maintenance operation without prior authorisation. Follow all recommended maintenance and service procedures.

- Keep operator's compartment free of all loose objects that are not properly secured.

- Do not wear rings, wrist watches, jewellery, loose or hanging apparels, such as ties, torn clothing, scarves, unbuttoned or unzipped jackets that can catch on moving parts. Wear proper safety equipment as recommended for the job. Examples: hard hat, heavy gloves, ear protection, safety glasses or goggles, reflector vests, respirator. Consult your employer for specific safety equipment requirements.

- Do not use controls or hoses as hand holds when climbing on or off machine. Hoses and controls are movable and do not provide a solid support. Also, controls may be inadvertently moved causing accidental machine or equipment movement.

- Do not jump on or off the machine. Keep two hands and one foot, or two feet and one hand in contact with step grab rails and handles at all times.

- Do not perform any service operation on the machine with a person seated in the operator's compartment, unless he is an authorised operator co-operating in the operation to be performed.

- Keep operator's compartment, stepping points, grabrails and handles clear of foreign objects, oil, grease, mud or snow accumulation to minimise the danger of slipping or stumbling.

  Clean mud or grease from shoes before attempting to mount or operate the machine.

- Keep shoes free of mud or grease before climbing or driving the machine.

- Never attempt to operate the machine or its tools from any position other than seated in the operator's seat.

- When maintenance operations require moving hydraulically operated attachments by means of machine's hydraulic system remember that all manoeuvres must be made only when seated in the operator's seat. Before starting machine or moving attachment or tools, set brakes , sound horn and call for an all clear. Raise attachment slowly.

- Always block booms or parts of the machine which must be raised to perform interventions under them with external devices. Do not allow persons to move into the vicinities nor standing under equipment not being blocked. Unless you are totally sure about your safety, avoid staying under raised equipment, even in case it is blocked.

SAFETY RULES

- Do not place the body, limbs or fingers into sharp articulation uncontrolled openings of the machine and without proper protections, unless they are blocked in a safe manner.

- Never perform interventions with engine running, except as called for in a Manual. Do not wear loose clothing or jewellery near moving parts.

- When servicing or maintenance require access to areas that cannot be reached from the ground, use a ladder or step platform that meet local and national regulations, to reach the service point. If such ladder or platform are not available, use the machine hand holds and steps as provided. Perform all service or maintenance carefully.

- Shop and/or field service platforms or ladders must be constructed and maintained in accordance with local and national regulations.

- Disconnect batteries and tag all controls according to current regulations to warn that work is in progress. Block machine and all attachments that must be raised according to current regulations.

  Due to the presence of flammable fluids, never check or fill fuel tanks, batteries, nor use starting fluid near lighted smoking materials or open flames.

- BRAKES ARE INOPERATIVE when manually released for servicing. Provisions must be made to maintain control of the machine by blocking or other means.

- The fuel filling nose must be kept constantly inside the filling neck. Keep this contact from the beginning to the end of the fuelling operation to avoid the possibility that sparks due to static electricity are generated.

- Use only designated towing or attaching points. Use care in making attachments. Make sure pins and/or locks are secure before pulling. Stay clear of drawbars, cables or chains under load.

- To move a disabled machine, use a trailer or a low-boy, if available. In case towing is needed , use all necessary signals required by local and national regulations, and follow the directions provided in this Manual.

- To load/unload a machine from transporter, choose a level surface ensuring firm support to the wheels of truck or trailer. Use strong access ramps, with adequate height and angle. Keep surface free of mud, oil or slippery materials.

- Anchor the machine securely to the bed of truck or trailer and block wheels or tracks with appropriate wedges.

- Never align holes with fingers or hands; always use appropriate aligning tools.

- Eliminate all sharp edges and burrs from re-worked parts.

- Use only approved grounded auxiliary power sources for heaters, chargers, pumps and similar equipment to reduce the hazards of electrical shocks.

- Lift and handle heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch-out for people in the vicinity.

- Never pour gasoline or diesel fuel into open, wide and low containers. Never use gasoline, solvent or other flammable fluid to clean parts. Use exclusively qualified, non-flammable, non-toxic commercial solvents.

- When using compressed air for cleaning parts, use safety glasses with side shields or goggles. Limit pressure to 2 bar, in accordance with local and national regulations.

- Do not run the engine in closed areas without proper ventilation to remove deadly exhaust fumes.

- Do not smoke or permit any open flames or spark near when re-fuelling or handling flammable materials.

- Do not use an open flame as a light source to look for leaks or for inspection anywhere on the machine.

- Make sure that all mechanic's tools are in good conditions. NEVER USE tools with mushroomed heads or frayed. Always wear eye protections.

- Move with extreme care when working under the machine, its attachments and or on or near them. Always wear protective safety equipment as required, such as hard hat, goggles, safety shoes, ear plugs.

- When performing operations requiring running of the engine, have a qualified operator in the operator's seat at all times with the mechanic on sight. Place the transmission in neutral and set the brakes and safety lock.

- KEEP HANDS AND CLOTHING AWAY FROM MOVING PARTS.

- For field service, move machine to level ground, if possible, and block it. If work on an incline is absolutely necessary, first block machine and its attachments securely, than move it to level ground as soon as possible.

SAFETY RULES

- Do not trust worn and /or kinked chains and cables: do not use them for lifting or pulling operations. To handle them, always use heavy gloves.

- Be sure chains and cables are anchored and the anchor points are strong enough to handle the expected load. Keep exposed personnel clear of anchor points and cables or chains.

- No bystanders are allowed near the hooking points, chains or cables.

- DO NOT PULL UNLESS OPERATOR's COMPARTMENT OF MACHINES INVOLVED ARE PROPERLY GUARDED AGAINST POTENTIAL CABLE OR CHAIN BACKLASH.

- Keep the area where maintenance operations are performed CLEAN and DRY. Eliminate immediately all water and oil spillages.

- Do not pile oily or greasy rags; they represent a fire hazard. Store in closed metal container.

- Before starting machine, check, adjust and lock the operator's seat for maximum comfort and control of the machine. Be sure exposed personnel in the area of operation are clear of the machine before moving it or its attachments. Sound horn.

- Rust inhibitors are volatile and flammable Use only in well ventilated areas. Keep open flames away - DO NOT SMOKE - Store containers in a cool well ventilated place, secure against unauthorised personnel.

- Do not carry loose objects in pockets that might fall unnoticed into open compartments.

- Wear proper protective equipment such as safety goggles or safety glasses with side shields, hard hat, safety shoes, heavy gloves when metal or other particles are apt to fly or fall.

- Wear welders protective equipment such as dark safety glasses, helmets, protective clothing, gloves and safety shoes, when welding or burning. Wear dark safety glasses near welding zones.

  DO NOT LOOK AT ARC WITHOUT PROPER EYE PROTECTION.

- Know your jacking equipment and its capacity. Be sure the jacking point used on the machine is appropriate for the load to be applied. Be sure the support of the jack at the machine and under jack is appropriate and stable.

- The load lifted by jacks is always dangerous: it is necessary to transfer loads to appropriate blocking as a safety measure, before proceeding with service or maintenance work, according to local or national regulations.

- Steel cables are frayed after prolonged use; always wear appropriate protections (heavy gloves, goggles etc.).

- Handle all parts carefully. Keep hands and fingers away from structures, gears or moving parts. Use and wear always the appropriate protections

- Compressed air systems can have water deposits created by moisture condensation due to changes of atmospheric conditions. If required, discharge deposits, as instructed.

STARTING

- Do not run the engine in closed areas without proper ventilation to remove deadly exhaust fumes.

- Do not place head, body, limbs, feet, hands or fingers, near rotating fans or belts. Be especially alert near pusher fans.

ENGINE

- Loosen the radiator cap very slowly, to release pressure from the system, before removing it. All coolant level top-ups must be performed with engine OFF.

- Avoid that flammable materials touch exhaust parts. Should this be possible, provide the necessary protections.

- Do not run engine when refuelling and use care if the engine is hot due to the increased possibility of a fire if fuel is spilled.

- Never attempt to check or adjust fan belts when engine is running.

- Do not adjust engine fuel pump when machine is moving.

- Do not lubricate the machine with engine running.

- Do not run the engine with air intakes, door or protections open.

ELECTRICAL SYSTEM

- Disconnect batteries prior to any intervention on machine or electrical system (cleaning, repair, maintenance).

- Should booster batteries be used, remember to connect both ends of the booster cables in the proper manner (+) with (+) and (-) with (-). Avoid short-circuits of the terminals. Follow thoroughly the instructions of this Manual.

- Before any intervention, make sure that the main switch is OFF.

- BATTERY GAS IS HIGHLY FLAMMABLE. Leave battery box open to improve ventilation when recharging batteries. Never check charge by placing metal objects across the posts. Keep sparks or open flames away from batteries. Do not smoke near battery to guard against the possibility of causing an explosion.

- Before any intervention, make sure that there are no fuel or electrolyte leakages; eliminate them before proceeding with further work. When recharging batteries in closed ambients, make sure that there is appropriate ventilation to prevent possible accidental explosions due to the accumulation of gases generated during the recharge.

HYDRAULIC SYSTEM

- Fluid escaping under pressure from a very small hole can be almost invisible and can have sufficient force to penetrate the skin. Use a piece of cardboard or wood to search for suspected pressure leaks. DO NOT USE HANDS. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

- Stop the engine and release all pressures in the system before removing panels, housings, plugs or covers.

- In case pressures must be measured, use instruments of adequate capacity. Always follow the recommended procedures.

TOOLS

- Keep head, body, limbs, feet, fingers or hands away from bucket, blade or ripper when in raised position.

  Prior to any intervention, install all safety devices according to current rules and regulations.

- In case equipment on the machine must be operated by hydraulic systems, remember to proceed only after seating in the operator's compartment. Make sure that there are no persons in the operating area of the machine. Alert people before operating using the horn and by voice. Move the equipment very carefully.

- Do not use machine to transport loose objects, unless proper devices for this purpose are provided.

- Clutches and brakes of this machine and eventual auxiliary equipment and attachments (such as operating cylinder or winches control valves) must always be properly adjusted in accordance with the instructions provided by the Manuals of the Manufacturer.

- Never perform adjustments with engine running, except when called for by the above instructions.

  When changing work shift, check that wheel or rim securing screws and brackets are not loosen; if necessary, retighten to the prescribed torque.

WARNING

On machines having hydraulically, mechanically, and/or cable controlled equipment (such as shovels, loaders, dozers, excavators etc.) be certain the equipment is lowered to the ground before servicing, adjusting and/or repairing. If it is necessary to have the hydraulically, mechanically, and/or cable controlled equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the hydraulic lift cylinders, cable and/or mechanical devices used for controlling the equipment.

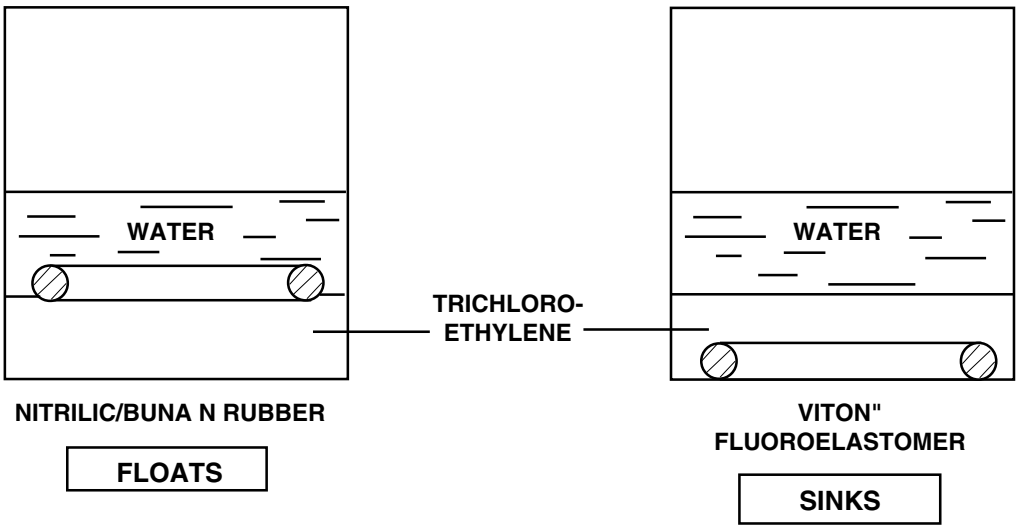
SAFETY RULES FOR SEALS

VITON SEALS (fluoroelastomer)

Seals, especially VITON O-Rings, (normally coloured red) are used in systems operating at high temperatures, since this materials resists the effects of heat. However, in the event this material is subject to heat exceeding 315 °C (599 °F) (in practice, only in case of fire or when using welding flames) fluoridic acid is generated. **This acid is highly corrosive and could cause severe burns**, if in contact with the skin.
Every time it is necessary to intervene on components equipped with VITON rings, for which an exposure to excessive temperatures is suspected, the following procedures must be applied:

1) inspect visually, without touching them, all seals showing signs of damage due to high temperature. They look black and tacky;
2) identify the type of material of the seals, if they are VITON, performing the test illustrated below, on the spare parts;
3) in case it is verified, or there is a reasonable doubt that the components are made of VITON, the contaminated area MUST be decontaminated before proceeding with further operations;
4) wear neoprene rubber or PVC gloves and protection goggles or face screen, and wash accurately the contaminated zone with a solution of hydraulic lime (found at building stores) and water, so that a milky liquid is obtained. Rinse carefully with steam or running water;
5) dispose of the materials removed and the protective gloves in a safe manner, without burning them.

TEST FOR THE DISCRIMINATION OF RUBBER (BUNA N) MATERIALS AND "VITON" (FLUOROELASTOMER) MATERIAL



D180 (Tier 2)

DOZERS

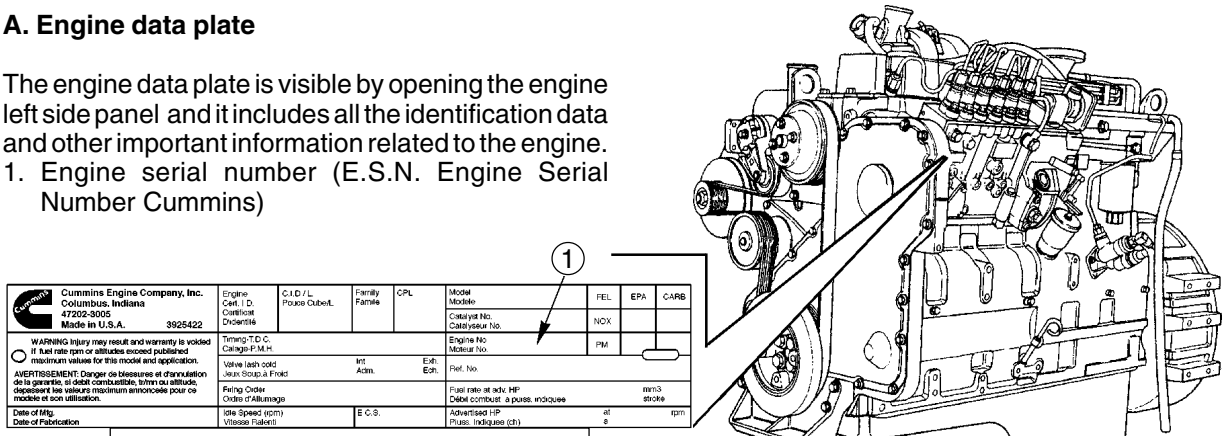
TECHNICAL DATA TABLES

IDENTIFICATION DATA

A. Engine data plate

The engine data plate is visible by opening the engine left side panel and it includes all the identification data and other important information related to the engine.

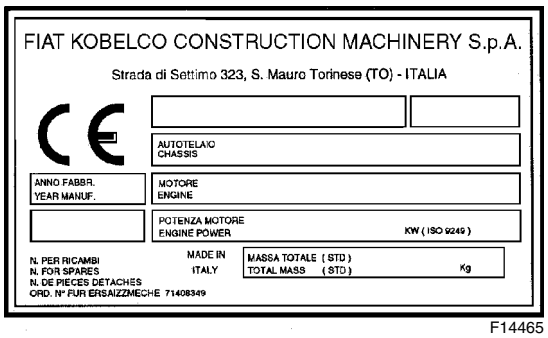
1. Engine serial number (E.S.N. Engine Serial Number Cummins)

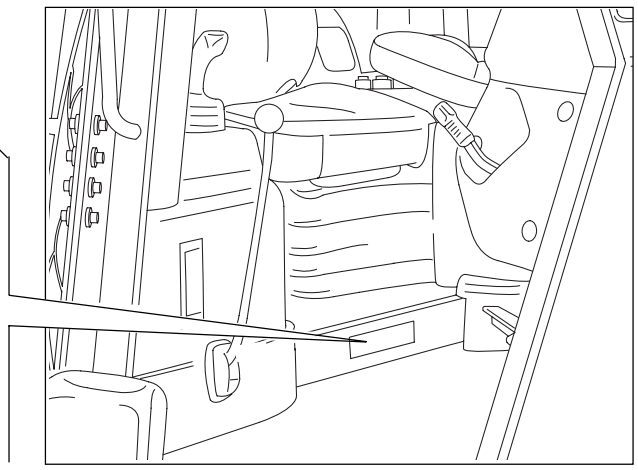


IMPORTANT ENGINE INFORMATION
This engine conforms to 2002 U.S. EPA And California Tier I and EU Stage II regulations for heavy duty non-road compression ignition diesel cycle engines as applicable.
THIS ENGINE IS CERTIFIED TO OPERATE ON DIESEL FUEL

B. Machine identification plate

The identification plate includes the main data of the machine and it is visible under the operator's seat.



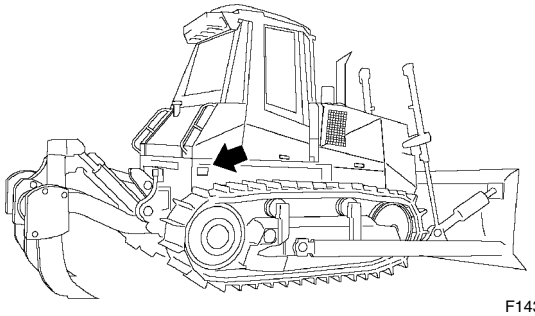


F14465

C. Marking and serial number

On the right side of the transmission housing it is possible to read the MARKING of the machine, composed of:
- manufacturer code (the first three digits) ZEF;
- machine code;
- machine serial number (last eight digits).

MODEL	MARKING
D180 LT (Power Steering)	☆ ZEF 0D181S 00340XXX ☆
D180 XLT (Power Steering)	☆ ZEF D181ST 00350XXX ☆
D180 LGP (Power Steering)	☆ ZEF D181SP 00360XXX ☆
D180 LT (Clutch)	☆ ZEF 0D181F 00380XXX ☆
D180 XLT (Clutch)	☆ ZEF D181FT 00390XXX ☆



F14319

TABLE OF FLUID CAPACITIES

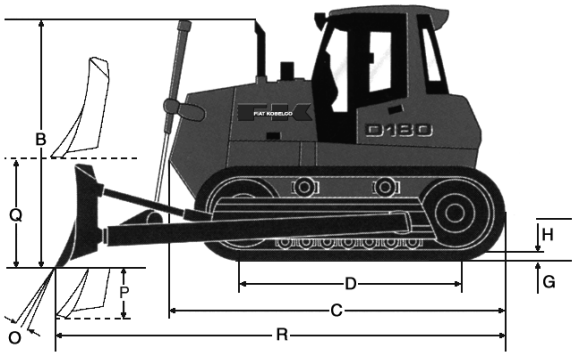
ITEM	QUANTITY (Litres)	Fluids and lubricants Ambra	VISCOSITY GRADE	Outdoor temperatures of reference	International Classification
Cooling system	28 (30)	Agriflù	Agriflù mixed with 50 % water protects down to - 35 °C (- 31 °F)	Down to - 35 °C (-31 °F)	Mixture of water and antifreeze at 50%. The mixture provides oxidation, foaming, corrosion, scaling and freezing protection properties down to - 35 °C (- 31 °F).
Fuel reservoir	400	–	–	–	DIESEL FUEL ASTM No. 2D Grade TT of reputable quality and make
Engine	16 (19)	Super Gold	SAE 15W - 40	- 15 to 40 °C (-5 to 104 °F)	API CF-4/SG or CCMC D4 or MIL-L-2104 E
			SAE 10W - 30	- 25 to 20 °C (-13 to 68 °F)	
Torque converter Transmission	31 (40)	Hydropower	SAE 10W	All season	ATF Type A Suffix A
Transmission housing steering/brakes	46 (60)	Super Gold	SAE 15W - 40	- 15 to 40 °C (-5 to 100 °F)	API CF-4/SG or CCMC D4 or MIL-L-2104 E
			SAE 10W - 30	- 25 to 20 °C (-13 to 68 °F)	
Hydraulic system "BULLDOZER" equipment D180 D180 Power Steering / D180 LGP	90 (110) 110 (130) 110 (130)	HI-TECH 46	ISO 46	- 20 °C to 50 °C (- 4 to 122 °F)	DIN 51524 PART - 1 DIN 51524 PART - 2 ISO VG 46
Final drives (each)	33	Hypoide 90	SAE 80W - 90	All season	API GL5 or MIL-L-2105
Idlers Rollers and track chains	7	Super	SAE 15W - 40	- 15 to 40 °C (5 to104 °F)	API CE or CCMC D4 or MIL-L-2104 E
			SAE 10W - 30	- 25 to 20 °C (-13 to 68 °F)	
Grease fittings		MG2	NLGI2 consistency	All season	–
Cab tilting pump	0.5	Hydropower	SAE 10W	All season	ATF Type A Suffix A

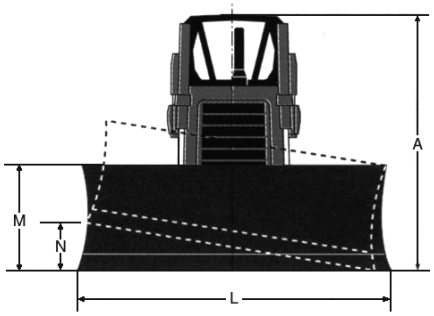
Note: Oil quantities indicated are those required for periodical changes.
- ( ) First supply quantity.

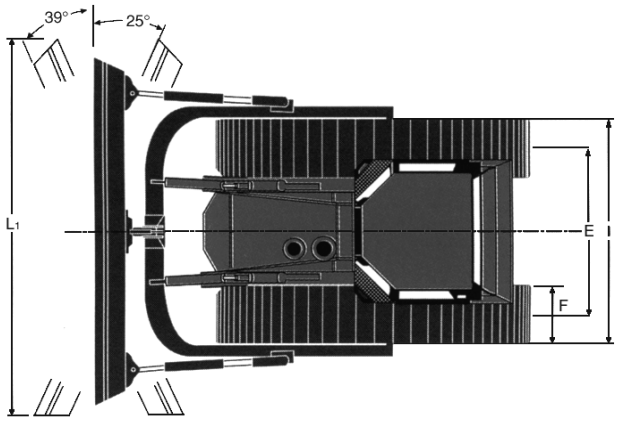
If the content of sulphur of the fuel exceeds 0.5 %, change the engine oil as follows:

Down to 0.5 % sulphur	Periodical change
from 0.5 to 1 %	Half normal interval
Over 1 %	One quarter normal interval

MAIN DIMENSIONS







TRACTOR DIMENSIONS		LT	XLT	LGP
A Cab height from the ground	mm	3235 (127.4 in)	3235 (127.4 in)	3235 (127.4 in)
B Muffler height from the ground	mm	3170 (124.8 in)	3170 (124.8 in)	3170 (124.8 in)
C Machine frame length	mm	4210 (165.7 in)	4210 (165.7 in)	4210 (165.7 in)
D Pitch	mm	2700 (106.2 in)	3205 (126.2 in)	3205 (126.2 in)
E Track	mm	1900 (74.8 in)	1900 (74.8 in)	2082 (82 in)
F Shoe width	mm	560-610 (22-24 in)	560-610 (22-24 in)	762-915 (30-36 in)
G Rib height	mm	71.5 (2.8 in)	71.5 (2.8 in)	71.5 (2.8 in)
H Free space from the ground	mm	390 (15.3 in)	390 (15.3 in)	390 (15.3 in)
I Carriage width with shoes 560 (22 in)	mm	2460 (96.8 in)	2460 (96.8 in)	–
Carriage width with shoes 610 (24 in)	mm	2510 (98.8 in)	2510 (98.8 in)	–
Carriage width with shoes 760 (30 in)	mm	–	–	2844 (111.9 in)
Carriage width with shoes 915 (36 in)	mm	–	–	2997 (118 in)
Shipping weight without blade ****	kg	17290 (38117.9 lb)	18390 (40543 lb)	19410 (42791.7 lb)

BLADE DIMENSIONS		Half-U (HSU)	With angle (HA)	Half-U (HSU)	Half-U 3 m	With angle (HA)	Straight (HS)
Blade capacity SAE J1265	m^3	5.6 (197.8 ft^3)	3.18 (112.3 ft^3)	5.6 (197.8 ft^3)	5.0 (176.8 ft^3)	3.18 (112.3 ft^3)	3.7 (130.7 ft^3)
L Blade width	mm	3460 (136.2 in)	4000 (157.5 in)	3460 (136.2 in)	2990 (117.7 in)	4000 (157.5 in)	3900 (153.5 in)
L1 Width with angle blade**	mm	–	3650 (143.7 in)	–	–	3650 (143.7 in)	–
M Blade height	mm	1425 (56.1 in)	1030 (40.5 in)	1425 (56.1 in)	1425 (56.1 in)	1030 (40.5 in)	1110
N Max. tilt	mm	850 (33.5 in)	550 (21.6 in)	850 (33.5 in)	800 (31.5 in)	550 (21.6 in)	836 (32.9 in)
O Max. pitch	*	10°	10°	10°	10°	10°	10°
P Digging depth	mm	472 (18.5 in)	452 (17.8 in)	550 (21.6 in)	550 (21.6 in)	452 (17.8 in)	535 (21 in)
Q Blade raising from the ground	mm	1100 (43.3 in)	1148 (45.2 in)	1190 (46.8 in)	1190 (46.8 in)	1148 (45.2 in)	1160 (45.7 in)
R Machine length with blade***	mm	5487 (216 in)	5316 (209.3 in)	5878 (231.4 in)	5878 (231.4 in)	5316 (209.3 in)	5675 (223.4 in)
Operating weight with blade*	kg	20530 (45260.9 lb)	19650 (43320.8 lb)	20800 (45856 lb)	20700 (45635 lb)	21630 (17685.9 lb)	22730 (50111 lb)

* Includes ROPS cab, 610 mm (24 in) shoe (915 mm (36 in) for LGP), fuel and operator, for a machine with ROPS substract 300 kg (661.4 lb), for Power Steering version add 330 kg (727.5 lb).

** Maximum angle ± 25°.

*** With the ripper raised, add 935 mm (36.8 in) to the dozer length.

**** Includes ROPS cab, blade lifting cylinders, lubricants and 10% fuel (for Power Steering version add 330 kg) (727.5 lb).

TECHNICAL DATA D180 Power Steering - D180 Steering Clutch

TECHNICAL	DATAS		LT/XLT	LGP
PERFORMANCES	**Max. speeds**			
	FORWARD			
	1st	km/h (mph)	4.1 (2.6)	4.3 (2.7)
	2nd	km/h (mph)	7.1 (4.4)	7.0 (4.3)
	3rd	km/h (mph)	11.1 (6.9)	10.8 (6.7)
	REVERSE			
	1st	km/h (mph)	5.3 (3.3)	5.3 (3.3)
	2nd	km/h (mph)	8.5 (5.3)	8.6 (5.3)
	3rd	km/h (mph)	13.2 (8.2)	13.2 (8.2)
	Max. towbar pulling effort			
	FORWARD			
	1st	kN	282 (63.3)	297.0 (66.7)
	2nd	kN	160 (36)	168.7 (37.9)
	3rd	kN	90.5 (20.3)	95.8 (21.5)
	REVERSE			
	1st	kN	221.7 (49.8)	233.9 (52.6)
	2nd	kN	124.7 (28.0)	131.8 (29.6)
	3rd	kN	69.5 (15.6)	73.7 (16.6)
	Ground pressure			
	in operating conditions	kPa	65	
	in operating conditions - multi-shank ripper	kPa	71.5	
	Climbing capacity (FWD)			
		LT/XLT / **LGP**		
	1st	3 km/h (1.87 mph) / 3,4 km/h (2.1 mph)	%	60
	2nd	5 km/h (3.1 mph) / 5,6 km/h (3.5 mph)	%	30
	3rd	9.0 km/h (5.6 mph) / 10 km/h (6.2 mph)	%	10
	Front equipment cycle times (ref. semi-U blade)			
	Raising time (from ground to max. height)	sec	2.9	
	Controlled lowering	sec	1.4	
	Floating	sec	1.4	
	Noise			
	Outside (2000/14/CE)LwA	dB(A)	111	
SAFETY DEVICES	Back-up alarm			
	Left safety lever It blocks the equipment, cuts-off the transmission and engages the parking brake			
	Right safety lever It blocks the equipment, cuts-off the transmission and engages the parking brake			

TECHNICAL DATA D180 (Tier 2)

ENGINE AND ACCESSORIES	Engine manufacturer		-	Cummins	
	Engine model		-	6CTAA - 8.3	
	Engine type: Direct injection, 4-stroke turbocharged, after-cooling				
	Bore and stroke		mm (in)	114 x 135 (4.5x5.3)	
	Total displacement		L (gal.)	8.3 (2.2)	
	Number of cylinders		-	6	
	D180 LT/XLT	**kW**		**HP**	
	Net power kW hp	rated @ 2000 rpm	peak @1700 rpm	rated @ 2000 rpm	peak @1700 rpm
	DIN 6270	136	142	182	190
	SAE J1349	134	140	180	187
	ISO9249	135	141	182	189
	EEC 80/1269	136	142	182	190
	D180 LGP	**kW**		**HP**	
	Net power kW hp	rated @ 2000 rpm		reted@ 2000 rpm	
	DIN 6270	147		197	
	SAE J1349	145		194	
	ISO9249	146		196	
	EEC 80/1269	147		197	
	Torque limit		deg	45	
	Fuel consumption (MAX. POWER)		kg/h (lb/h)	30.7 (67.7)	
	Starting capacity				
	Standard configuration		°C (°F)	-12 (10)	
	With cold starting system		°C (°F)	-25 (-13)	
	Electrical system				
	System voltage		Volt	24	
	Capacity of starter motor		kW (HP)	7.8 (10.5)	
	Capacity of alternator		Amp	70	
	Radiator				
	Dimensions of transmission heat exchanger		-	-	
	Dimensions of body (coolant)		mm (in)	454x1040x114 (18x41x4.5)	
	Material of body (Inclined and stacked brass tubes with copper fins)		-	-	
	No of tubes per line		-	6	
	Gauge of fins		mm (in)	3.5 (0.1)	
	Cap pressure		bar (psi)	1.0 (14.5)	
	Air radiator/air				
	Fan diameter		mm (in)	500 (19.7)	
	N. hoses			32	
	Pitch			2.8	
	Radiant surface		dm^2 (in^2)	31.3 (485.1)	
	Operating pressure		bar (psi)	2 (29)	

TECHNICAL DATA D180 (Tier 2)

ENGINE AND ACCESSORIES	Water pump flow (at normal speed)	L/min (US gpm)	270 (71.3)	
	Fan (Blowing) / Soundproof blowing fan		**TRUFLO**	**ABB**
	Fan diameter	mm (in)	762 (30)	704 (27.7)
	Blade pitch	deg	26	27
	Number of blade	-	6	6
	Dimension of blades	mm (in)	178x258 (7x10.2)	-
	Drive ratio (fan/engine)	-	0.87:1	0.87:1
	Air cleaner			
	Brand		Donaldson	
	Type		FHG12-0345	
	Dry type, two stages with safety element and centrifugal separator			
	Setting of clogging indicator	bar in H_2O	0.062 (25)	
	Initial clogging (@ 13 cum /min) Cummins limit : 15 in H_2O	bar in H_2O	0.023 (9.4)	
	Dust containment capacity (@ 13 cum /min) Cummins limit : 25 g/CFM	g/CFM	21	
	Dimensions	mm (in)	304.8 (12)	
	Pre-cleaner			
	Rotor/centrifuge assembly, it uses centrifugal force to separate contaminants carried by the air	efficiency	85%	
	Recommended operation range	L/min (CFM)	9910.9 to 19821.8 (350 ÷ 700)	
	Silencer		Donaldson	
	Horizontal type. Under hood.			
	Dimensions	mm (in)	209x292x600 (8.2x11.5x23.6)	
	Max. counter-pressure (Cummins limit: 76 mmHg, 1.46 psi)	bar (mmHg)	0.10 (75)	
FUEL TANK	Total volume	L (US gal)	400 (106)	
	Specifications of filler cap		-	
TORQUE CONVERTER AND HOUSING	Brand:	Twin Disc		
	Model:	15" MS 335		
	Type:	Single stage, single phase		
	Stall ratio	-	2.28 : 1	
	Nominal diameter	mm (in)	381 (15)	
	Setting of pressure relief valve @ 10 L/min (2.642 gpm)	bar (psi)	10.5 (152.3)	
	Nominal flow of transmission pump @ 17 bar (246.5 psi)	L/min (US gpm)	66.0 (17.4)	
	Nominal flow of TC @3 bar (43.5 psi)	L/min (US gpm)	116.0 (30.6)	
	Wet TC housing with scavenger pump			

TECHNICAL DATA D180 (Tier 2)

TRANSMISSION	Type: countershafts Model: TM 200 Make: FK Specifications: 3 + 3 speeds, speeds and direction modulation valves electronic controls + automatic mode integrated CPU and TM control		
	PTO capacity		
	Max. torque @ 0 rpm	daNm (lbf.ft)	169 (1246)
	Max. speed @ 0 torque	rpm	2183
	Specifications: Clockwise rotation (from rear of machine) driven by Torque Converter		
	Shaft specifications:		
	Number of teeth	-	21
	Module	mm (in)	1.58 (0.06)
	Outer diameter	mm (in)	34.87 (1.37)
	Filters:		
	Suction:		
	Metal mesh + magnetic rod	mesh	100
	Line:		
	Screwed-on	Micron	25 abs.
	Setting of by-pass valve	bar (psi)	3.44 (49.9)
	Collecting capacity @ 3.44 bar (49.9 psi) (ISO 4572)	g (lb)	50 (0.1)
	Filtering area	cm^2 (in^2)	3075 (476.6)
	Loss of charge @ 80 L/min (21.1 gpm)	bar (psi)	0.71 (10.3)
	Nominal pressure of element	bar (psi)	34.5 (500.4)
	Rupture pressure of element	bar (psi)	70 (1013.3)
	Setting of transmission regulation valve (@ 66 L/min) (17.4 gpm)	bar (psi)	17 (246.6)
	Oil radiator body in aluminium	mm (in)	310x1010x150 (12.2x39.8x5.9)
	Controls: Finger tip type, FNR pivoting control, shift up-down switches, neutral switch Safety levers		
	Description of auto mode AL Down-shifting of transmission when the engine slows down to a pre-determined speed AS Allows the operator to pre-select the 1st speed in froward and the 2nd in reverse at direction changes		
PROPELLER SHAFT	Dimension of shaft Mechanical 7C		
	Nominal length	mm (in)	425 (16.7)

TECHNICAL DATA D180 (Tier 2)

BEVEL GEAR GROUP	Gleason type, modular pinion assembly. Forced lube pinion bearings			
			D180 Power Steering	**D180 Steering Clutch**
	Ratio:		17/36	13/40
	Module:	mm (in)	10 (0.4)	9.23 (0.36)
STEERING SYSTEM	The machine uses a differential steering system; this consists of a hydraulic pump, a hydraulic motor, controls, two planetary modules and a steering gear train. The rear transmission has two power inlets. One from the bevel gear for the speed and Forward reverse, the other from the motor, to turn. The steering system is actuated by two "finger tip" (potentiometric levers), located on the left side of the operator's seat.			
	The levers send an electric signal to the microprocessor controlling the two proportional solenoid valves; these valves convert the electric signal into a hydraulic one, piloting the steering section of the main valve. This section controls the pump flow to the hydraulic motor that through the steering gear train, actuates the two planetary modules and the right track chain.			
	The open hydrostatic circuit includes: - main pump the same of the equipment (see hydraulic system)	cc/rev	130	
	- hydraulic motor Bent axis design, axial pistons, fixed displacement motor (with bolt-on movement control valve)			
	Displacement	cc/rev	90	
	Max. operating pressure	bar (psi)	350 (5076)	
	- Steering control valve Closed centre. This section is included in the implement control valve			
	- Steering control Electro-Hydraulic control with two proportional valves Integrated CPU for steering and TM control			
	- Priority valve It provides priority to the steering over the equipment control (blade raising)			
	- Make-up valve It provides pressure to both equipment control pilot valves and to the proportional solenoid valves	bar (psi)	30 (435.1)	
	- Oil radiator Aluminium body	mm (in)	590x179x63 (23.2x7x2.5)	
	By-pass setting	bar (psi)	5 (72.5)	
	Planetary modules See "power train" diagram			
	Gear ratio straight travel conditions	-	1.44	
	Steering line See "power train" diagram			

TECHNICAL DATA D180 (Tier 2)

STEERING SYSTEM D180 POWER STEERING	Gear ratio Hydraulic motor to sprocket	-	1.92
	Performance		
	Min. steering radius	m (in)	1.0 (39.4)
	Max. differ. track chain speed, no load condition	km/h (mph)	4.0 (2.5)
	Max. differ. track chain torque at 350 bar	daNm (lbf.ft)	0.72 (5.3)
STEERING SYSTEM D180	The steering system is driven by two levers located on the left side of the operator's compartment. During translation, the lever sends a modulated pressure through the electronic control unit and the electroproportional valves to the steering control valve. The first pressure controls the steering clutch disconnection. The second pressure is equal to zero until the first pressure reaches 16 bar (50% of lever stroke). It applies the steering brakes positively. The service brake system is negatively controlled by the brake pedal or by pulling the two levers at the same time. The pedal operation cuts the brake system counterpressure with modulation and applies the braking load with the springs.		
	Steering clutches: - Typology - Control		with multiple discs, oil bath through spring electro-hydraulic
	Number of clutch driven discs (sintered)		7 (per clutch)
	Number of driving discs (sintered)		8 (per clutch)
	Total area for one clutch		7612 cm^3
	Inner diameter		280 mm
	Outer diameter		350 mm
BRAKES	**Steering filters** Suction Metal mesh + magnetic rod	mesh	100
	Aligned filters:		
	Screwed-on	Micron	25 abs.
	Setting of by-pass valve	bar (psi)	3.44 (49.9)
	Collecting capacity @ 3.44 bar (ISO 4572)	g (lb)	50 (0.11)
	Filtering area	cm^2 (m^3)	3075 (476.6)
	Loss of charge @ 80 L/min	bar (psi)	0.71 (1029.7)
	Nominal pressure of element	bar (psi)	34.5 (500.4)
	Rupture pressure of element	bar (psi)	70 (1015.5)
	Multiple discs, spring actuated, oil released, oil cooled		
	No. of clutch discs	-	5
	Outer diameter	mm (in)	350 (13.8)
	Inner diameter	mm (in)	280 (11)
	Total friction area	cm^2 (in^2)	2771 (429.5)
	Friction material	-	sintered
	No of springs	-	20

TECHNICAL DATA D180 (Tier 2)

BRAKES	Max. braking torque	daN (lb)	1016 (2284)	
	Pump flow (@engine max. speed)	L/min	50	
	System pressure	bar (psi)	25 (362.6)	
SECTION STEER./BRAKES	Fabricated housing			
FINAL DRIVE	Countershaft, double reduction, modular assembly			
	Total ratio	-	12.286	
SPROCKET	Segments. 9 Elements			
	No. of teeth	-	27	
	Pitch diameter	mm (in)	880.25 (34.6)	
TRACK FRAME	Fabricated structure with two sealed boxes			
	Sealed track tensioner compartment			
UNDER-CARRIAGE			**LT**	**XLT/LGP**
	Link pitch	mm (in)	203 (8)	203 (8)
	No. of links	-	40	45
	Link height	mm (in)	128 (5)	128 (5)
	Shoe height	mm (in)	71.5 (2.8)	71.5 (2.8)
	Weight of shoes per metre	kg/m (lb/in)	38.2 (2.13)	38.2 (2.13)
	Width of standard shoe	mm (in)	560 (22)	915 (36)
	Width of optional shoes	mm (in)	610 (24)	762 (30)
			LT	**XLT/LGP**
	No. of track rollers	-	7	8
	Sequence of rollers from sprocket	-	SF-DF-SF-DF -SF-DF-SF	SF-DF-SF-DF SF-SF-DF-SF
	Diameter of rollers	mm (in)	210 (8.3)	210 (8.3)
	No. of support rollers	-	2	2
	Diameter of rollers (support)	mm (in)	187.5 (7.4)	187.5 (7.4)
	Diameter of idler wheel	mm (in)	690 (27.2)	690 (27.2)
TRACK TENSION SYSTEM	Sliding idler guides with replaceable wear strips			
	Sealed track tensioner compartment. Grease piston for track tension adjustment			
	Single spring.			
	Nominal load of spring assembly	daN (lb)	19509 (430173)	
	Outside diameter of spring	mm (in)	245 (9.6)	
	Diameter of wire	mm (in)	53 (2.1)	
	Diameter of grease piston	mm (in)	75 (2.9)	
	Setting of relief valve	bar (psi)	900 (35.4)	
	Pivot shaft (near sprocket) and fixed frond cross-member			
	All joints permanently sealed			

TECHNICAL DATA D180 (Tier 2)

TRACK TENSION SYSTEM	Diameter of pivot shaft	mm (in)	120 (4.7)	
	Thickness of cross-member	mm (in)	80 (3.1)	
	Swing travel (track chain)	deg	± 3.5	
	Idler travel (total)	mm (in)	255 (10)	
TRACK SUSPENSION SYSTEM	Fabricated structure, with two main members. Bolted to steering compartment housing.			
	Width of frame	mm (in)	1040 (40.9)	
	Width of longeron	mm (in)	100 ÷ 145 (3.9 ÷ 5.7)	
COUNTER FRAME	Fabricated structure, with two main members. With integrated mudguards.			
	Total width	mm (in)	1984 (78.1)	
HOOK FRAME	Bolted to steering compartment housing			
	Pin diameter	mm (in)	45 (1.8)	
	Shim of bar	mm (in)	90 (3.5)	
HYDRAULIC SYSTEM	Load sensing system, splits the flow with piloted variable pump. The feeding valve provides pressure to both pilot valve controls and the proportional solenoid valves A priority valve provides priority to the steering over the equipment control (blade raising).			
	System pressure		**D180 Power Steering**	**D180 Steering Clutch**
	Setting of dual pressure relief valve (equipment/steering)	bar (psi)	160/350 (2320/5076)	180/200 (2610/2900)
	Pressure of piloting line	bar (psi)	30 ÷ 32 (435 ÷ 464)	30 ÷ 32 (435 ÷ 464)
	Main pump: axial pistons		**D180 Power Steering**	**D180 Steering Clutch**
			Variable displac.	Fixed displac.
	Governors:			
	constant power control	kW (HP)	90 (120.7) @ 1950 rpm	-
	Cut-off pressure	bar (psi)	350 (5076)	250
	Load sensing	bar (psi)	20 ÷ 21 (290 ÷ 304)	
	Brand		Rexroth	Rexroth
	Model		A11V0130	A10V0100
	Max. displacement	cc/rev	130	88
	Pump speed at max. engine speed	rpm	1912	1912
	Pump max. flow	L/min (gpm)	249 (65.8)	170
	Min. displacement	cc/rev	15	15
	Pressure stand-by	bar (psi)	33 ÷ 37 (478.6 ÷ 536.6)	28 ÷ 32

TECHNICAL DATA D180 (Tier 2)

HYDRAULIC SYSTEM	**Tool control valve:** Piloted, Closed centre, flow partition, with unloading valve.		**D180 Power Steering**	**D180 Steering Clutch**
			4 spools	3 spools
	Brand		Rexroth	Rexroth
	Model		4M7 - 22	3M6 - 15
	Nominal dimensions	mm (in)	22 (0.86)	15 (0.59)
	1st spool Ripper (raising, lowering)			
	2nd spool Blade tilt (left, right)			
	Max. delivery	L/min (gpm)	70 (18.5)	70 (18.5)
	3rd spool Blade (raising, owering, float, with hook)			
	4th spool Steering motor			Does not exist
	Pilot valve Single lever for 2nd and 3rd spool			
	Brand		Rexroth	
	Model		5THF6	
	Auxiliary lever Single lever for 1st spool			
	Brand		Rexroth	
	model		2TH6	
	Cylinders:			
	Blade 2-with quick-drop valves and stroke limitation valve			
	Bore	mm (in)	95 (3.7)	
	Rod diameter	mm (in)	60 (2.4)	
	Stroke	mm (in)	1250 (49.2)	
	Tilt (bulldozer blade)			
	Bore	mm (in)	140 (5.5)	
	Rod diameter	mm (in)	70 (2.7)	
	Stroke	mm (in)	126 (4.9)	
	Tilt (angledozer blade)			
	Bore	mm (in)	110 (4.3)	
	Rod diameter	mm (in)	63 (2.5)	
	Stroke	mm (in)	124 (4.9)	
	Ripper			
	Bore	mm (in)	100 (3.9)	

TECHNICAL DATA D180 (Tier 2)

HYDRAULIC SYSTEM	Rod diameter	mm (in)	56 (2.2)	
	Stroke	mm (in)	480 (18.9)	
	Hydraulic tank		**D180 Power Steering**	**D180 Steering Clutch**
	Total tank capacity	L (US gal)	90 (23.8)	90
	Oil tank volume	L (US gal)	70 (18.5)	70
	Capacity oil circuit	L (US gal)	130 (34.3)	110
	Strainer			
	Media Metalic mesh			
	Filtration capacity	micron	250	
	By-pass valve setting	bar (psi)	0.2 (2.9)	
	Max. nominal flow	L/min (gpm)	275 (72.6)	
	Surface	cm^2 (in^2)	1480 (229.4)	
	Pressure drop at max. flow	bar (psi)	0.02 (0.29)	
	Return filter			
	Media inorganic glass fibre paper	-		
	Filtration capacity	micron (absolute)	10	
	By-pass valve setting	bar (psi)	2.5 (36.2)	
	Differential switch setting	bar (psi)	2.2 (31.9)	
	Surface	cm^2 (in^2)	9000 (1395)	
	Max. nominal flow	L/min (gpm)	440 (116.2)	
OPERATOR'S COMPARTMENT	**Cab:**			
	Fully enclosed cab, modular, tiltable to 60° on the left side. ROPS-FOPS structure with 4 posts.			
	Two doors, two side windows. 4 resilient supports			
	Cab lay-out description			
	Left console:			
	With fully adjustable armrest (satellite) including the Steering and Transmission controls. The console holds: Auto T/M switches, left safety lever, Climatization dashboard.			
	Right console:			
	Support for hydraulic joystick and 3rd function lever, adjustable armrest, horn, ashtray, ignition key.			
	Front control module:			
	Monitor, control switches, throttle hand lever (RH)			
	Pedal support: Central brake pedal, decelerator pedal (RH), footrest (2)			
	Cab accessories:			
	Rear mirror			
	Front window windshield wiper, door windshield wipers			
	Rear windshield wiper			
	Ashtray and cigarette light			

TECHNICAL DATA D180 (Tier 2)

OPERATOR'S COMPARTMENT	Dom light (2) FM-AM Radio (12 Volt) Can holders 12 V jack for lunch box refrigerator		
	No. of air ducts	-	10
	Seat		
	Make		Kab
	Model		301
	Adjustment range	mm (in)	150 (5.9)
	Height adjustment	mm (in)	60 (2.4)
	Other features		
	Fabric coath, with safety belt and tie links		
	Heater group		
	Heating capacity (air inlet temp. -10 °C; air flow 600 m^3/h; water inlet temp. 85 °C; water flow 800 L/h)	kW (HP)	10.4 (13.9)
	Filter:		
	Media, inorganic glass fibre paper		
	Efficiency	%	> 65
	Capacity	micron	0.3
	Size	cm^2 (in^2)	19600 (3038)
	Recirculation percentage:		
	No. of fans (type: SPAL 006-839-22 3 speed - total free flow 1160 m^3/h)		2
	No. of fan speeds		3
	Max. cab air flow (free total air flow 1160 m^3/h)	m^3/h (ft^3/h)	500 (17657)
	Max. pressurization	bar (psi)	0.0019 (0.028)
	Air conditioner group		
	Max. gas charge	g (lb)	1600 (3.5)
	Cooling capacity (air inlet temp. +30 °C; air flow 600 m^3/h; air relative humidity 55%)	kW (HP)	6 (8)
	Re-circulation percentage	%	na
	Compressor		
	Make		Sanden
	Model		SD7H1SMD7948
	Displacement (max. allowed speed 7000 rpm)	cc/rev	160
	Thermostat valve setting		+1 °C (33.8 °F) open: diff. temp. setting 3.5 °C (38.3 °F)
	Pressure switch (2 level type): LOW LEVEL: HIGH LEVEL:		 open 2 bar, closed 2.1 bar open 25 bar, closed 19 bar
	Expansion valve		2 TON - 6000 kcal/h