

# **FD145**

**EFF. S/N 101101-UP  
CUMMINS ENGIE 6 BT 5.9**

**CRAWLER DOZER**

## **OPERATION AND MAINTENANCE INSTRUCTION MANUAL**

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# FD145

crawler dozer

## Operation and maintenance instruction manual

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**WARNING**

STUDY THE OPERATION AND MAINTENANCE INSTRUCTION MANUAL THROUGH BEFORE STARTING, OPERATING, MAINTAINING, FUELING OR SERVICING THIS MACHINE.



This symbol is your safety alert sign. It means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.



Read and heed all safety instructions carrying the signal words WARNING and DANGER.



Machine mounted safety signs have been color coded yellow with black borders and lettering for warning and red with white borders and lettering for danger points.

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## TO THE OWNER

Dear Customer, thanks for the preference given us! We are certain that this choice will offer satisfaction and reliability in time, provided the Rules relative to the Operation and Maintenance provided by this Manual are observed.

This manual has been prepared to assist you in the correct safe procedures for driving, operating and servicing your new loader.

Only continuous compliance with the norms herein detailed guarantees best performance, economic operation, and durability of your loader and prevents the commonest causes for accidents which might occur during operation or maintenance.

Particularly as regards safety, we recommend to carefully read the general safety precautions detailed in pages I to VII.

Repair procedures for this loader are contained in specific Service Booklets which you may obtain by your Dealer.

### AFTER-SALES SERVICE

For maintenance work which cannot be easily carried out by the Owner, please contact your Dealer or other Service Centres where you will find trained personnel, suitable correct tools and equipment and genuine spare parts. Service personnel and technicians will be glad to provide you with all explanations and suggestions you may need and to carry out all required specialised repair work in case of loader unsatisfactory operation.

### SPARE PARTS

It should be pointed out that optimum loader operation is ensured only if genuine spare parts are used for replacement.

Upon ordering please detail:

- loader type and serial number
- engine type and serial number
- catalogue part number for the part being ordered.

Machine manufactured by:

FIAT-HITACHI EXCAVATORS - Zona Industriale - 73100 LECCE (Italy) - Tel. (0832) 6881

A set of Manuals including Operation and Maintenance Manual and Spare Parts Catalogue is provided with the machine.

The information provided by this Manual is valid at the time of printing. Since the Manufacturer constantly improves its products, some information could result not up-to-date. In case discrepancies are experienced, please contact the Sales and Service Organisation.



## SAFETY RULES

### GENERALITIES

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

Read and heed all safety rules before any intervention.

Read and heed all rules and machine-mounted safety signs, prior to any intervention. Safety signs applied to the machine are identified by a colour code: yellow background with black edges for warnings and red background with white edges for danger zones.

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, grab-rails and handles clear of foreign objects, oil, grease, mud or snow accumulation to minimise the danger of slipping or stumbling.

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. Controls also 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.

### STARTING

**Never start or 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.

Inform the maintenance supervisor about any eventual malfunction of components and systems.

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

Before climbing on-board, **walk around the machine for an inspection.** Sound the horn.

Obey the indications provided by flags, posters and signals.

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 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.

### OPERATION

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

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.

**Do not carry riders on machine,** unless appropriate devices are available to prevent falling-off.

Study and familiarise with escape routes alternate to normal exit routes. Seat belts are required 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 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. Obey all indications provided by flags and signals. Sound the horn. Never coast the machine down grades and slopes with the transmission in neutral or neutralised, on power shift type machines, or clutch disengaged on manually shifted machines.

## SAFETY RULES

Select and engage the most appropriate speed required by the working conditions so as to avoid any loss of control

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

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 removed. 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. Field right-of-way to loaded machines.

Maintain clear vision of areas of travel or work. Keep cab windows clean and repaired. Keep the bucket low while travelling, to obtain a better visibility

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.

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.**

Before starting operations, inspect the work site evaluating any possible risk and danger. 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 enclosed cabs, always let open a discharge to the outside, to ensure 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.

Do not operate machine with brakes out of adjustment. Refer to the instructions provided by this publication on this subject.

When counterweights are provided, do not work machine if they have been removed, unless a compensating weight or an equivalent load as been provided.

Transport a loaded bucket as far tipped-back and in as low a position as possible for maximum visibility, stability and safest transport of the machine.

Move at a proper speed for the load and ground conditions.

The bucket load must always be properly arranged; move with extreme care when transporting oversized loads.

Use only the type of bucket recommended for the machine and the materials to be handled. Follow the recommendations for the loading capacity and the arrangement of the materials, the specifications of the terrain and the job to be performed.

Do not lift and haul loads overhead where persons are standing or working, or downhill when working on slopes; in the latter case, the bucket must be unloaded on the uphill side, whenever possible.

With a full bucket, start and stop the machine carefully; avoid starting without first reducing the engine r.p.m..

## SAFETY RULES

Never use the bucket as a man lift or to carry riders.

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. Load trucks from the driver's side whenever possible.

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.

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

When travelling the machine with ripper inoperative, this must be kept in maximum raised position.

Lower it and rest it on the ground when parking.

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.

Be alert of people in the operating area of the machine. Load trucks from the driver's side whenever possible.

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

When crossing gullies or ditches, move at an angle (perpendicularly) 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 over-speed. Select proper gear before starting down grade.

Avoid side hill travel, whenever possible. Drive up and down the slope (from the top to the bottom). Should the machine slip 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.

With crawler machines, it is necessary to familiarise with the secrets of reversed steering: read the appropriate instructions in the relevant chapter.

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.

Avoid brush piles, logs or rocks. **NEVER DRIVE OVER THEM** or other surface irregularities that break 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 up-rooted causing the roll-over of the unit) etc..



**SAFETY RULES****STOPPING**

When the machine is stopped for whatever reason, always remember to position the transmission drive control in neutral and engage the control lock to secure the machine.

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.

Place the controls in rest position. Place the gearshift lever in neutral and cut-off the engine. Lock the gearshift control, set the parking brake and switch-off and lock the starter switch. 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. Set parking brake. 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, hands and feet away from blade, arms, bucket 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 unauthorized 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.

Securely block the machine and lock it every time you leave it unattended. Return keys to authorized security. Heed all shut-down operations of the Operation and Maintenance Instruction Manual are followed. Every time you leave the machine, engage parking brake (if equipping unit).

**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 unauthorized personnel to perform any maintenance operation. Do not perform maintenance operation without prior authorization. Follow all recommended maintenance and service procedures.

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 handholds when climbing on or off the machine. These components are movable and do not provide a solid support. Controls may also be moved unintentionally causing accidental machine or equipment movements.

Do not jump on or off the machine. Keep two hands and one foot, or two feet and one hand in contact with steps and 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 authorized operator co-operating in the operation to be performed.

Keep operator's compartment, stepping points, grab-rails and handles clear of foreign objects, oil, grease, mud or snow accumulation to minimize 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.

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

Always block with external supports any linkage or part on machine that requires work under the raised linkage, part or machine. Never allow anyone to walk under or be near unblocked raised equipment. Unless you are positively sure that total safe condition exist, avoid staying under raised equipment, even if blocked.