

752EX Vibratory Compactor

SERVICE MANUAL

Part number 48174560

English

April 2018

Sample of manual. Download All 475 pages at:

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CASE
CONSTRUCTION

Product: Case 752EX Vibratory Compactor Roller Service Repair Manual 48174560
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48174560 20/04/2018

EN

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INTRODUCTION

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Foreword - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your Sales and Service Networks.

Safety rules

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules

Carefully read the safety rules contained herein and follow advised precautions to avoid potential hazards and to safeguard your safety and personal integrity.

Your safety and that of the people around you depends on you.

It is essential that you understand this manual for a correct inspection, lubrication and repair of this machine.

Read this manual carefully and check that:

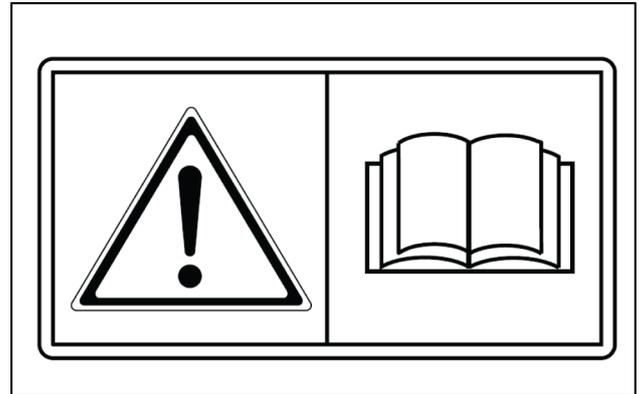
- You understand fully the symbols on the controls and the safety signs used in this manual and on the machine.
- You understand fully the speed, stability, braking and steering characteristics of the machine. If you are in any doubt, consult your Dealer.

The safety messages in this section concern situations which may arise during normal machine operation, servicing and repair. These safety messages also indicate the different ways of coping with these situations. Other safety messages are used throughout the manual to indicate specific dangers.

The information given in this chapter is a summary of the basic rules to respect at all times and does not exempt you from observing traffic regulations or the requirements of insurance companies.

The presence of grease, oil, mud or (in winter) ice on the steps and access handles can cause accidents. Make sure they are always clean.

When mounting or dismounting from the machine always face the machine and use the steps and access handles on the left-hand side of the machine.



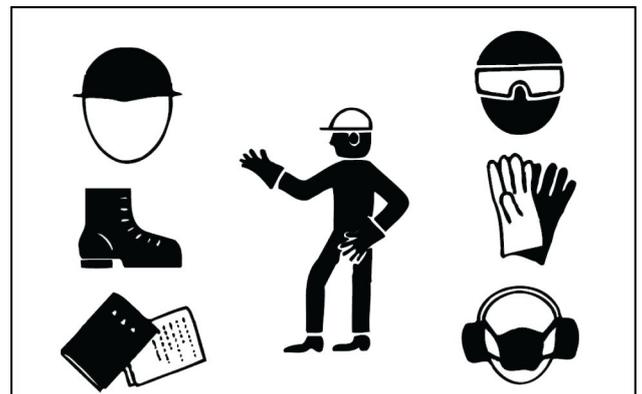
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Wear close fitting clothing and safety equipment appropriate for the job:

- Safety helmet
- Safety shoes
- Heavy gloves
- Reflective clothing
- Wet weather clothing

If the environment conditions make it necessary, the following personal safety equipment should be at hand:

- Respirators (or dustproof masks)
- Ear plugs or acoustic ears protections
- Goggles with lateral shield or masks for eyes protection



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Do not wear rings, wristwatches, jewels, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get caught into moving parts.

Any functional disorders, especially those affecting the safety of the machine, should therefore be rectified immediately.

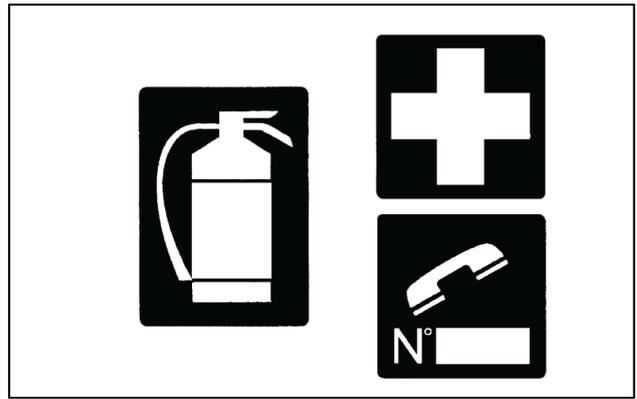
INTRODUCTION

Make sure that you fully understand the symbols of the safety decals applied on the machine. Make sure that they are always clean and perfectly legible.

Be prepared for emergencies.

Always keep a first aid kit and a fire extinguisher close at hand on the machine.

Make sure that the fire extinguisher is serviced in accordance with the manufacturer's instructions.



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Safety rules

Prevention of fire or explosions

The engine fuel can originate an explosion or a fire.

Never refuel when the engine is running.

Do not smoke during refuelling.

Take all the necessary safety measures when welding, grinding or when working near a naked flame.

Use a non-flammable product for cleaning parts.

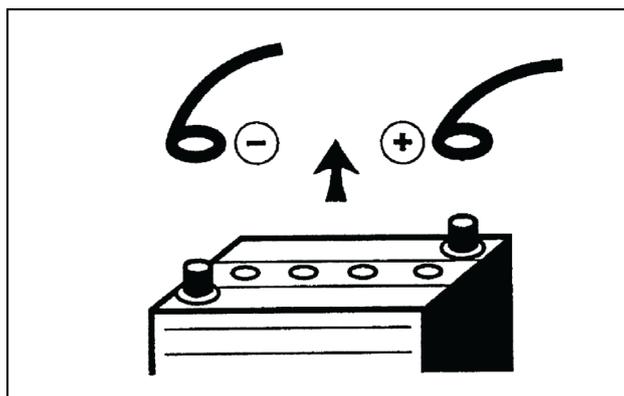


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A spark or a flame can cause the electrolyte of the battery to explode.

To prevent any risk of explosion, observe the following instructions:

- When disconnecting the battery cables, always disconnect the negative (-) cable first.
- To reconnect the battery cables, always connect the negative (-) cable last.
- Never short-circuit the battery clamps with metal objects.
- Do not weld, grind or smoke near a battery.



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The engine exhaust may produce sparks.

Before using the machine in an area which may contain inflammable vapours, ensure that there is good ventilation.

Always keep a fire extinguisher available on the machine.

Make sure that it is properly maintained in conformity with the manufacturer's instructions.

Prevention of burns

The battery electrolyte generates severe burns.

The battery contains sulphuric acid.

Avoid any contact with the skin, eyes or clothing.

Antidote:

- EXTERNAL: Rinse well with water, removing any soiled clothing.
- INTERNAL: Avoid vomiting. Drink water to rinse your mouth. Consult a doctor.
- EYES: Rinse thoroughly with water for **15 min** and get prompt medical attention.

When the electrolyte of a battery is frozen, it can explode if you attempt to charge the battery or if you try to start the engine using a booster battery.

Always keep the battery charged to prevent the electrolyte freezing.

Batteries generate explosive gases.

Keep all flames, sparks and cigarettes away.

Provide good ventilation when changing a battery or using a battery in an enclosed space.

Always protect your eyes when working near a battery.

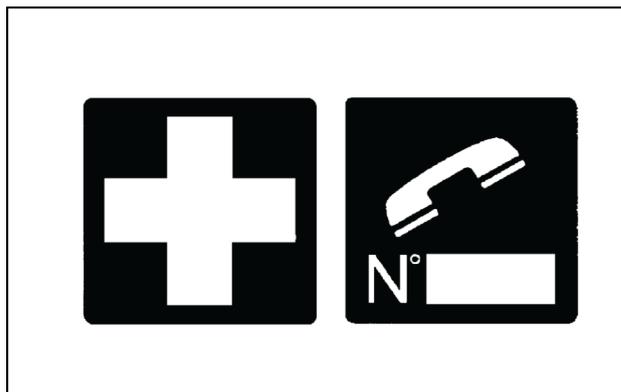
Never touch the battery terminals with your hands.

This can induce a state of electrolysis and impair the main organs of the body.

Hot coolant could spray out if the radiator cap is removed while the system is still hot.

To remove the cap: Allow the system to cool down, turn the cap to the first notch and wait until there is no more pressure.

Then remove the cap.



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LELI12TLB0054AA 4



LELI12TLB0055AA 5

Precautions for waste disposal

Improperly disposing of waste can threaten the environment.

Each country has its own Regulations on this subject. It is therefore advisable to prepare suitable containers to collect and store momentarily all solid and fluid materials that must not be scattered in the environment to avoid pollution.

At preset intervals these products will be delivered to disposal stations legally recognized and present in this Country.

Here below is a list of the products in the machine which require disposal:

- Hydraulic oil
- Brake system oil
- Coolant mixture, condensation residue and pure anti-freeze
- Diesel oil
- Oil and diesel oil filter elements
- Engine and air-conditioning air filter elements
- Battery

Also polluting rags, paper, sawdust and gloves must be disposed in compliance with the same procedures.

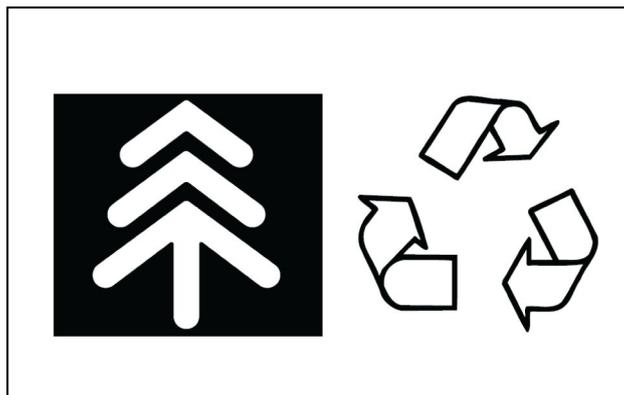
Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air-conditioning coolant escaping into the air can damage the Earth's atmosphere.

Government regulations may require a certified air-conditioning service centre to recover and recycle used air-conditioning coolant.

Obtain information on the proper way to recycle or dispose of waste from your local environmental or recycling centre, or from your Dealer.



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Personal safety

1. Make sure to arrest all fuel leaks. Any fuel or oil spilled on hot surface or electrical components may cause fire accidents. Make sure that the machine is sealed from leakage.
2. Do not allow straw, trash, bird nests or flammable material in the machine and remove the same as they can ignite fire on hot surfaces.
3. Make sure the fire extinguisher installed on or near the machine. If already equipped, the fire extinguisher is maintained and serviced according to the manufacturer's instructions.
4. Check and make sure to clean all the trash from the machine especially around hot components such as the engine, transmission, exhaust, battery, etc. Do these checks and clean the machine at least once a day, probably at the end of the day. More frequent checks and cleaning of machine may be necessary depending on the operating environment and conditions.
5. Inspect the electrical system for loose connections and frayed insulation. Repair or replace the loose or damaged parts.
6. Check and remove the debris accumulation around moving components such as bearings, pulleys, belts, gears, cleaning fans, etc. More frequent cleaning of the machine may be necessary depending on the operating environment and conditions.
7. Check all fuses, relay, and MCB's for correct ratings and validity. Replace the defective or non-complaint parts. Do not to bypass/override/tamper any safety systems of the machine.
8. Check and remove any oily rags or other flammable material on the machine. Do not to store such material around or on the machine.
9. Make sure that do not weld or flame cut any items that contain flammable material. Clean the items thoroughly with non-flammable solvents before welding or flame-cutting.
10. Immediately investigate any unusual smells or odors that may emerge during operation of the machine. Always aware of such observations and actions thereof.
11. Make sure that the machine is serviced only by authorized CASE CONSTRUCTION dealer service team and not by any external parties.
12. Check and remove any non-recommended devices that are fitted on the machine. Do not to use any devices that are not a standard fitment by the company.
13. The personnel make sure that they do not smoke or use mobiles while refuelling. It is not advisable to park the machine near a place which poses fire hazard (Workshops where welding, grinding, gas cutting etc is underway, bonfires etc).

NOTICE: Any damage to the machine due to non-adherence of the above guidelines and instructions may lead the warranty void for the machine.

Safety rules - Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE CONSTRUCTION strongly recommends that you return all used batteries to a CASE CONSTRUCTION dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



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Mandatory battery recycling

NOTE: The following requirements are mandatory in Brazil.

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

Safety rules - Shop and assembly

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
 - Position the welder ground clamp as close to the welding area as possible.
 - If you weld in close proximity to a computer module, then you should remove the module from the machine.
 - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

5. Remove the battery ground cable. Reconnect the cable when you complete welding.

WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Failure to comply could result in death or serious injury.

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Special tools

The special tools that CASE CONSTRUCTION suggests and illustrate in this manual have been specifically researched and designed for use with CASE CONSTRUCTION machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

Torque

Size	Grade 8.8	Grade 10.9	Grade 12.9
M5	5.5 N·m	7.5 N·m	9 N·m
M6	9 N·m	12.5 N·m	15 N·m
M8	22.5 N·m	31.5 N·m	36 N·m
M10	44 N·m	62 N·m	75 N·m
M12	77.5 N·m	110 N·m	130 N·m
M14	120 N·m	170 N·m	210 N·m
M16	190 N·m	265 N·m	320 N·m
M18	260 N·m	365 N·m	435 N·m
M20	370 N·m	520 N·m	620 N·m
M22	500 N·m	700 N·m	840 N·m
M24	640 N·m	900 N·m	1080 N·m
M27	950 N·m	1350 N·m	1620 N·m
M30	1300 N·m	1800 N·m	2160 N·m

Unions, connections and plugs

Diameter * Pitch	
M10 x 1	20 N·m
M12 x 1.5	35 N·m
M14 x 1.5	45 N·m
M16 x 1.5	60 N·m
M18 x 1.5	70 N·m
M22 x 1.5	100 N·m
M27 x 2	200 N·m
M33 x 2	280 N·m
M42 x 2	380 N·m

Nuts for pipes and hoses

Diameter * Pitch	
M16 x 1.5	20 N·m
M18 x 1.5	35 N·m
M20 x 1.5	45 N·m
M24 x 1.5	60 N·m

Flanges

Diameter * Pitch	
M8 X 1.5	28 N·m
M10 x 1.5	55 N·m
M12 x 1.75	90 N·m
M14 x 2	145 N·m
M16 x 2	230 N·m

Hydraulic contamination - Contamination

Contamination in the hydraulic system is a major cause of the malfunction of hydraulic components. Contamination is any foreign material in the hydraulic oil. Contamination can enter the hydraulic system in several ways.

1. When you drain the oil or disconnect any line.
2. When you disassemble a component.
3. From normal wear of the hydraulic components.
4. From damaged or worn seals.
5. From a damaged component in the hydraulic system.

All hydraulic systems operate with some contamination. The design of the components in this hydraulic system permits efficient operation with a small amount of contamination. An increase in this amount of contamination can cause problems in the hydraulic system. The following list includes some of these problems.

1. Cylinder rod seals leak.
2. Control valve spools do not return to neutral.
3. Movement of control valve spools is difficult.
4. Hydraulic oil becomes too hot.
5. Pump gears, housing, and other parts wear rapidly.
6. Relief valves or check valves held open by dirt.
7. Quick failure of components that have been repaired.
8. Cycle times are slow; machine does not have enough power.

If your machine has any of these problems, check the hydraulic oil for contamination. See types of contamination below. If you find contamination, use the Portable Filter to clean the hydraulic system.

NOTE: *There are two types of contamination, microscopic and visible.*

Microscopic contamination occurs when very fine particles of foreign material are in suspension in the hydraulic oil.

These particles are too small to see or feel. Microscopic contamination can be found by identification of the following problems or by testing in a laboratory. Examples of the problems:

1. Cylinder rod seal leak.
2. Control valve spools do not return to NEUTRAL.
3. The hydraulic system has a high operating temperature.

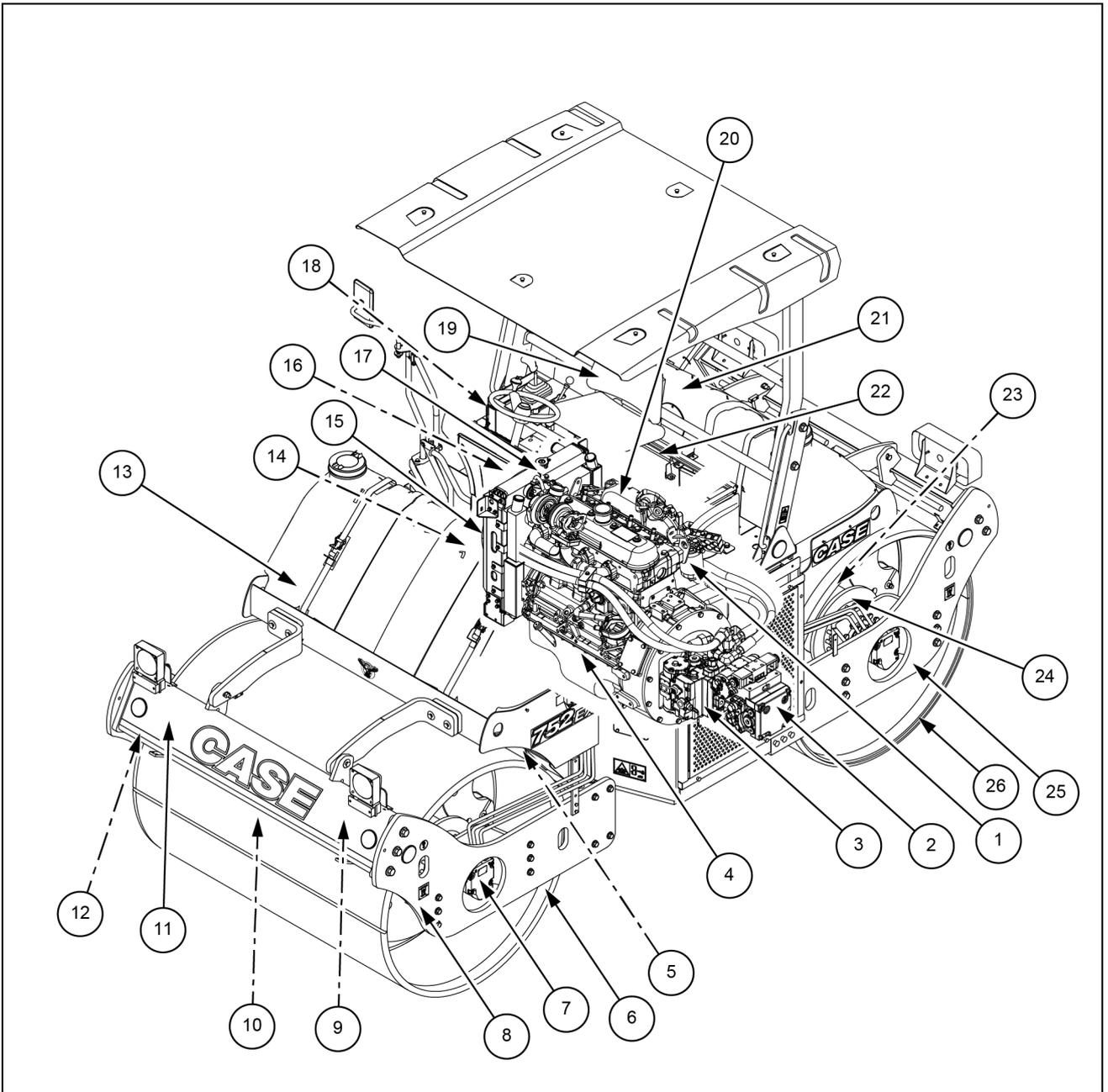
Visible contamination is foreign material that can be found by sight, touch, or odor. Visible contamination can cause a sudden failure of components. Examples of visible contamination:

1. Particles of metal or dirt in the oil.
2. Air in the oil.
3. The oil is dark and thick.
4. The oil has an odor of burned oil.
5. Water in the oil.

Capacities

Fuel tank	65 L (17 US gal)
Hydraulic oil	System capacity - 118.0 L (31 US gal) Tank capacity - 70.0 L (18 US gal)
Water tank - front	390 L (103 US gal)
Water tank - rear	390 L (103 US gal)
Engine oil	9.1 L (2.4 US gal) (Filter oil included) 8.6 L (2.3 US gal) (Filter oil excluded)
Coolant	18.5 L (4.9 US gal)
Exciter oil	3.5 L (0.9 US gal) Each
Gearbox oil	1.5 L (0.4 US gal) Each

Product identification



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- | | | | |
|-----|-----------------------|-----|----------------------|
| 1. | Hydraulic oil filters | 14. | Steering cylinder |
| 2. | Vibration pump | 15. | Hydraulic oil cooler |
| 3. | Travel pump | 16. | Steering unit |
| 4. | Engine | 17. | Radiator |
| 5. | Articulation Joint | 18. | Vibration motor |
| 6. | Front roller drum | 19. | Operators seat |
| 7. | Front travel motor | 20. | Steering pump |
| 8. | Scraper | 21. | Rear tank |
| 9. | Sprinkler tube | 22. | Battery |
| 10. | Front exciter shaft | 23. | Rear exciter shaft |
| 11. | Front roller frame | 24. | Rear travel motor |
| 12. | Elastic suspension | 25. | Rear chassis |
| 13. | Front tank | 26. | Rear roller drum |



SERVICE MANUAL

Machine completion and equipment

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Contents

Machine completion and equipment - 05

[05.102] Machine completion	05.1
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Machine completion and equipment - 05

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TECHNICAL DATA

Machine completion

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Machine completion - General specification

	Vibration stage 1	Vibration stage 2
	(Low Fre. High Amp.)	(High Fre. Low Amp)
Service weight	8840 kg	
Front axle load	4280 kg	
Rear axle load	4560 kg	
Nominal amplitude	1.0 mm	0.2 mm
Exciter frequency	33.3 Hz	50 Hz
Exciter force per drum	69.72 kN	34.5 kN
Static linear load per unit length (front)	25.50 kg/cm (26.37 lb/in)	25.50 kg/cm (26.37 lb/in)
Static linear load per unit length (rear)	27.22 kg/cm (28.09 lb/in)	27.22 kg/cm (28.09 lb/in)
Oscillating angle of front drum	10°	
Grade ability	36%	

Engine	
Make	IVECO,
Type	4 stroke, 4 cylinder, direct injection water cooled Turbocharger Engine, turbo pre-cleaner
Model	S8000
Bore	104.0 mm (4.1 in)
Stroke	115.0 mm (4.5 in)
Displacement	3908CC
Compression ratio	18:1 ±0.5
Nature of aspiration	Turbocharged
Power rating	56 kW (76 Hp) at 2200 RPM
Direction of rotation	Anti-clockwise (view from flywheel)
Type of fuel pump	Rotary
Type of fuel	Diesel
Type of air filter	Dry type with dual element
Type of governing	Mechanical with variable speed
Engine mounting	Transverse
Starting system	Electrical
Lubrication system	Forced feed
Net weight	330 kg

Propulsion	
Type	Hydrostatic system acting on both the drums.
Travel pump	Bidirectional, axial piston variable displacement with manually operated, servo controlled
Travel motor	Combination of a HSLT motor and a reduction gear box from Bonfiglioli
	The system consist of brakes on both front and rear drum
Working speed	0.0 – 5.5 km/h (0.0 – 3.4 mph) (Low speed high torque bidirectional, radial piston type, single displacement without brake on front drum and without brake on rear drum)
Transporting speed	0.0 – 11.0 km/h (0.0 – 6.8 mph) (Infinitely variable forward and reverse)

Exciter drive	
Type	Hydrostatic system acting on the front and rear exciter shafts.
Kind of exciter	Exciter shaft supported with both side bearing, Single shaft with two floating masses for dual amplitude
Vibration motor	Fixed displacement axial piston motor
Vibration pump	Bidirectional, Axial piston dual displacement, electrically operated, servo controlled

Exciter control	
Stage 1 (33.3 Hz)	High exciter force, low frequency, high amplitude
Stage 2 (50 Hz)	Low exciter force, high frequency, low amplitude

Steering system	
Type	Hydrostatic system controlled by open centred power steering unit, activated by two steering cylinders and steering cylinder mounted in the articulated joint
Steering pump	Fixed displacement gear type
Steering lock angle (Left-hand side and Right-hand side)	25°
Turning radius	
Minimum turning circle diameter	15.5 m (610.24 in)
Maximum clearance circle diameter	15.6 m (614.17 in)

Electrical system	
Battery	12 V, 110 A·h
Alternator	12 V, 65 A / 12 V, 105 A

Hydraulic oil filter	
Type	Micro glass element
Filter rating	10 Micron
Number of filters	1
Indicators	Indicators for battery non charging, engine low lubrication oil pressure, hydraulic oil filter clog, parking brake, turn hazard and high speed
Gauges	Digital hour meter, coolant temperature gauge, fuel gauge, and RPM gauge
Safety feature	Automatic vibration control Automatically applied parking brake in case of engine shutdown and no vibration in neutral
Standard equipment	Horn, dual drum vibration, vibration control on front/rear/both drums, 2 frequency/2amplitude, pressurized water sprinkler system, wear resistant scrapper, sun roof canopy, night working lights

Brakes	
Service brake	Hydrostatic
Parking brake	Hydraulic

Main components weight

Component	Weight
Engine	330.0 kg (727.5 lb)
Rear chassis	1044.0 kg (2301.6 lb)
Roller (bare)	1216.9 kg (2682.8 lb)
Roller (dressed)	1775.0 kg (3913.2 lb)
Articulation joint	170.0 kg (374.8 lb)
Eccentric mass	116.0 kg (255.7 lb)

Machine completion - Technical Data

Type	Hydrostatic system acting via the steering wheel, steering unit and steering cylinder mounted in the articulated joint
Steering pump	
Type	Gear type
Make	Ognibene
Displacement	15.7 cm³/rev
Steering lock angle or articulation angle (left-hand side and right-hand side)	25°

Minimum turning circle diameter	15.5 m (610.2 in)
Maximum clearance circle diameter	15.6 m (614.17 in)

Battery	12 V, 110 A·h
Alternator	12 V, 65 A / 12 V, 105 A (optional for additional work lights)

Fuse box

Fuse box is available below the operator's platform which is accessible from front left-hand side. . Three **15 A** and three **10 A** spare fuses are available in the fuse box.

	12	11	10	9	8	7	6	5	4	3	2	1	
A12					15 A Low beam		15 A High beam		10 A Neutral / high-low beam indicator				A1
B12					15 A Rear work lamp		15 A Front work lamp		10 A Vibration switch		10 A Reverse buzzer / lamp		B1
C12					15 A FIP Solenoid		10 A Tank refill pump		10 A Water pump-2		10 A Water pump-1		C1
D12					10 A Horn		10 A Hazard		10 A Drum selection		15 A Two speed / vibration/ stop / parking		D1
E12					10 A Pump control unit		15 A Side work lamp		10 A Instrument cluster		10 A Position lamp		E1

Bulb specification

Description	Rating
Head lamp	Low beam - 55 W and High beam - 60 W
Tail lamp	21 W
Front work light	55 W
Rear work light	55 W
Stop lamp	21 W
Park lamp (front)	5 W
Park lamp (rear)	10 W
Reverse lamp	21 W
Turn lamp	21 W