Zw series

WHEEL LOADER

- **Model Code**: ZW310
- **Operating Weight**: 22,400 kg
- **Bucket Capacity**: ISO Heaped: 3.4-4.2 m³
- **Max Engine Output**: 220 kW (299PS)
Introducing the New-Generation Wheel Loaders:

ZW Series

Top-Class Production with Amazing Mobility

The new ZW Series wheel loaders are packed with numerous innovative technologies and mechanisms. Total control of engine and pump torque is an industry’s first. Three work modes and three driving modes help enhance operating ease and yield high production. What’s more, lots of advanced designs give power and speed for loading and travel.

The ZW Series will set a new standard of productive, easy-to-operate wheel loaders.

Productivity
Three work modes to increase production and decrease fuel consumption
Three driving modes for optimum speed shift
Automatic transmission with load-sensing system
High-torque engine and capacious torque converter
Torque proportioning differential
Limited slip differential (Optional)
Smother simultaneous operations with advanced hydraulic circuit
Selectable clutch cutoff Timing
Lift arm auto leveler (Optional)
Ride control system (Optional)

Panoramic comfortable cab
Bi-level auto air conditioner and pressurized cab
Front & rear defrosters
Low noise design
Panoramic cab
Enhanced upward visibility
Good rear visibility
Ergonomically positioned switches and controls
Down-Shift Switch (DSS) and Up-Shift Switch (USS)
Multi-functional joystick lever (Optional)
Comfort-designed suspension seat

Easy Maintenance
Extended hydraulic oil replacement intervals
Easy draining
Conveniently located filters
Easy-to-replace air conditioning filters
HN bushings
Strategically located Fuel supply port
Large tool box
Easy-to-read monitor
Flat cab floor
Hinged radiator cover
Dirt-Less (DL) front frame

Enhanced Durability
Robust differential gears
Durable axles
Variable displacement pumps
Robust frame
Hydraulically operated cooling fan with heat-sensing system
Capacious hydraulic oil cooler
Protected fuel tank
Aluminum radiator and oil cooler
LED indicators and instruments
O-Ring Seal (ORS) joints and water-resistant electric connectors

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Note: Pictures may or may not include standard and optional equipment that are specified individually by countries.
The new ZW Series is packed with lots of technological advances: the TT* system, newly developed hydraulic system and transmission, well matching of operations, impressive mobility and big production with less fuel consumption, and much more.

*Total Torque-control*

Three Work Modes to Increase Production and Decrease Fuel Consumption

Three work modes are selectable according to job needs and operator’s preference. In each work mode, “TT” system controls the total torque of the engine and pump for well matched penetration force and implement speed according to job needs. The three work modes can be optimally selected to suit materials to be handled for higher production.

Three Driving Modes for Optimum Speed Shift

The three driving modes can be selected according to job needs and operator’s preference.

L mode : Starts with the second gear and makes gear shift at fast timing. Suitable for long-distance travel on level ground.

N mode : Starts with the second gear and makes gear shift at slow timing. Suitable for ordinary digging and loading operation such as V-shaped load and carry method.

H mode : Makes gear shift at timing similar to the N mode, and automatically shifts down to the first gear according to loading conditions without need for shift down by DSS* or manual shifting.

*Down-Shift Switch*

Smooth Speed Shift by Electronic Control

Quick, smooth speed shift can automatically be done with less shocks by electronic control through helical gears. This allows speedy job-to-job travel with less soil spills in load-and-carry operation.

High-Torque Engine and Capacious Torque Converter

Max. output : 220 kW (299 PS)
Rated output : 216 kW (294 PS)
Max. torque : 1 400 Nm (143 kgf m)

The new engine yields big torque at a low speed in direct response to acceleration without need for full throttle. The capacious torque converter enables powerful travel under heavy load, such as climbing steep or long hills without losing speed.

Torque Proportional Differential (Standard)

The torque proportional differential adjusts driving forces to both wheels. When road resistances under both wheels are different, this feature prevents slippage of a wheel on softer ground, unlike conventional differentials. This feature enables the ZW series to get out of swamps or rough terrain easily.

Limited Slip Differential (Optional)

On snowy roads and rough terrain, the limited slip differential can work instead of the torque proportional differential. This delivers effective driving force to both wheels for enhanced grip and less slippage during travel.

Packed with Numerous Technological Advances for Amazing Mobility and Big Production
An Array of Elaborate Mechanisms for Impressive Mobility and Big Production

Improved Rise / Run Performance

Arm rising while traveling for improved rise / run performance. On the new ZW Series, 10% higher rise/run performance can be expected, boosting loading efficiency and increasing productivity.

Smother Simultaneous Operations with Advanced Hydraulic Circuit

With the new parallel/tandem circuits, the lift arm and bucket can be operated at the same time, unlike conventional machines. This can remarkably increase digging and loading efficiency for higher production.

Selectable Clutch Cutoff Timing

Clutch cutoff timing can be selected from three positions to suit various job conditions, including rapid operation on level ground, and surefooted operation on gradient.

Clutch cutoff position switch

S mode : The clutch is cutoff at fast timing by depressing the pedal for speedy loading on level ground.

N mode : The clutch is cutoff by depressing the pedal midway for surefooted loading on slope.

D mode : The clutch is cutoff by depressing the pedal fully for dumping into a hopper on slope.

OFF : The clutch is disabled.

Sophisticated Mechanisms for Higher Job Efficiency

Float System
The float system lets the lift arm follow up road irregularities by using its self-weight only, without using its hydraulic circuit. This system is useful in soil-split collecting during loading, and snow removing.

Bucket Auto Leveler
The bucket can automatically be leveled parallel to the ground after rolling the bucket out. This can eliminate cumbersome bucket repositioning for efficient loading.

Lift Arm Kick-Out System
The lift arm can automatically be raised up to the preset level. This function is convenient when loading onto a dump truck, and when operating at confined job sites with restricted working height.

Lift Arm Auto Leveler (Optional)
The lift arm can automatically be raised and lowered to the preset level. By using the switches in the cab, high and low lift kickouts can be programmed.

Operator-Friendly Designs for Higher Job Efficiency

Restriction Valve
The restriction valve can effectively reduce shocks when moving the lift arm up and down. The bucket does not have a shockless circuit to allow efficient mud removal.

Ride Control System (Optional)
The ride control reduces pitching and bouncing during traveling on rough terrain and snow road by automatic control of the implement. Shocks and vibration can be well suppressed for riding comfort.
**Operator-First Designs:**

**Controls for Operator Comfort**

- **Bi-Level Auto Air Conditioner and Pressurized Cab**
  - The bi-level air conditioner allows air conditioning at foot space and overhead simultaneously. Airflow volume and direction can automatically be adjusted according to the temperature setting. The pressurized cab shuts out dust and debris even in dusty environment.

- **Front / Rear Defrosters**
  - With the front and rear defrosters, airflow comes out from three front air outlets and two rear outlets to protect respective windows from fogging, keeping clear vision even in rain and cold weather.

- **Hat (Resin Cab Roof)**
  - The hollow hat is provided atop the cab to form an air space. This greatly helps reduce the temperature rise in the cab, and increases the cooling efficiency of the air conditioner.

- **Shock-Dampened Cab**
  - The cab rests on fluid-filled elastic mounts to absorb shocks and vibration, and reduce resonance.

- **Low Noise Design**
  - The cab is well sealed, and the new low-noise engine is utilized to reduce sound, along with the following measures:
    - Hydraulically operated cooling fan with heat-sensing system
    - New Hitachi Silent (HS) fan
    - Sound-absorbing materials inside engine cover and cab
    - Clever arrangement of hydraulic oil tank and bulkhead

- **Ergonomically Positioned Switches and Controls**
  - Switches and controls are efficiently laid out in the right console for ease of operation.

- **Down-Shift Switch (DSS) and Up-Shift Switch (USS)**
  - DSS and USS are designed for one-gear down-shift and up-shift at the touch of a button.

- **Multi-Functional Joystick Lever (Optional)**
  - The multi-functional joystick lever is provided atop of the control lever for operating ease.

- **An Array of Standard Accessories**
  - Hat (Resin Cab Roof)
  - Front / Rear Defrosters
  - Shock-Dampened Cab
  - Low Noise Design
  - Ergonomically Positioned Switches and Controls
  - Down-Shift Switch (DSS) and Up-Shift Switch (USS)
  - Multi-Functional Joystick Lever (Optional)

- **Panoramic Cab**
  - The panoramic cab gives almost all-round visibility with the widened front glass window and pillar less cab rear corners. Front wheels are always in the operator’s vision, enhancing safety and increasing loading efficiency.

- **Enhanced Upward Visibility**
  - The front curved glass window gives good upward visibility, so the operator can directly see the movement of the bucket for safer loading.

- **Good Rear Visibility**
  - The engine cover is low profile, and rounded for better rear visibility, so the operator can directly see the rear wheels and counterweight.

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    - Clever arrangement of hydraulic oil tank and bulkhead

- **Adjustable Steering Column**
  - The steering wheel is tiltable, and telescopic to suit operator of all builds for comfortable operation.
Enhanced Durability

Durability is enhanced with a number of advanced mechanisms for long, continuous operation.

**Dependable Drive System**

- **Transmission**
  The transmission can effectively reduce the transmitting load. This helps reduce sound and extend service life, enhancing reliability.

- **Robust Differential Gears**
  Differential gears are thickened to increase rigidity.

- **Durable Axles**
  Front and rear axles are improved for durability. The axle housing is thickened for tough operation at quarries.

- **Robust Frame**
  The box-section frame is thickened and strengthened to resist torsion and increase durability. Center pins are widely spaced for higher resistance to torsion.

- **Hydraulically Operated Cooling Fan with Heat-Sensing System**
  Fan speed can be adjusted depending on fluid temperature to effectively cool down coolant, hydraulic oil, transmission oil, and torque converter oil. The result is extended component service life and reduction in fuel consumption. The fan is also separate from the engine for easy servicing.

- **Capacious Hydraulic Oil Cooler**
  The ample cooling capacity of the hydraulic oil cooler helps reduce oil temperature fluctuation and extend service life of components.

- **LED Indicators and Instruments**
  On the indicators, monitors and alarms, many LEDs are utilized for longer service life resulting in less failure, enhancing the reliability.

- **O-Ring Seal (ORS) Joints and Water-Resistant Electric Connectors**
  Numerous elaborate components are utilized for higher durability and reliability. The proven ORS joints and high-pressure hydraulic lines are utilized in the hydraulic system, and water-resistant wiring connectors in the electrical system.

- **Aluminum Radiator and Oil Cooler**
  The radiator and oil cooler are made of aluminum instead of conventional steel or copper for corrosion protection.

- **Variable Displacement Pumps**
  New variable displacement pumps are exclusively developed and designed for Hitachi wheel loaders for tough earthmoving.

- **Improved Braking Ability**
  The brake is a wet-type multi-plate brake, and housed in the axle.

- **Dependable Drive System**
  The large counterweight is arranged to protect the fuel tank from collisions with obstacles during operation.
Reduced Running Costs

Running and maintenance costs are reduced greatly with concentrated inspecting points and durable components.

Extended Hydraulic Oil Replacement Intervals (Up from 2 000 to 4 000 Hours)
Hitachi genuine hydraulic oil can quadruple hydraulic oil replacement intervals. A hydraulic oil drain hose is mounted standard.

Extended Filter Replacement Intervals (250 to 500 Hours)
Filter replacement intervals are extended by increasing engine oil capacity and using high-performance filters, slashing servicing costs and downtime.

Easy Draining
The engine oil drain port is located for the convenience of maintenance. No need for reaching under the machine.

Conveniently Located Filters
Dual fuel filters with sedimentary function and engine oil filter are strategically located for the convenient daily inspection and servicing from the ground.

Easy-to-Replace Air Conditioning Filters
The fresh air filter can easily be replaced from the cab, and circulation air filter also replaced by detaching the drink holder.

HN Bushings
The HN bushing containing high-viscosity oil is provided at each joint to reduce grease consumption, extend lubrication intervals (100 to 500 hours), and increase durability.

Strategically Located Fuel Supply Port
The fuel supply port is located for convenient fuel supply from the ground.

Flat Cab Floor
The cab floor is stepless (flat) for ease of cleaning.

Large Tool Box
A large tool box is provided at the top step of the ladder on the right side of the machine. The tool box can hold a grease gun and tool kit.

Reversible Hydraulically Operated Cooling Fan
The rotation of the hydraulically operated cooling fan with heat-sensing system can be reversed for easy removal of dirt from the radiator. The fan itself can swing open for easy cleaning.

Dirt-Less (DL) Front Frame
The DL front frame is shaped for easy removal of dirt, stones and snow.

Easy-to-Read Monitor
With the easy-to-read monitor, the operator can see instructions for scheduled servicing and maintenance.

Monitor Indication Items:
- Clock, service intervals, travel speed, mileage, hour meter

Replacement Alerting:
- Engine oil / filter, fuel filter, hydraulic oil / filter, transmission oil / filter

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The fresh air filter can easily be replaced from the cab, and circulation air filter also replaced by detaching the drink holder.
Safety-First Design

Achieving a High-Level of Safety in the Working Environment with an Array of Advanced Mechanisms

ROPS / FOPS Cab
The ROPS / FOPS cab is provided to protect the operator from injury in an accident.

ROPS : Roll-Over Protective Structure : ISO3477
FOPS : Falling Object Protective Structure : ISO3446

Highly Reliable Dual-Line Brake System
The dual-line hydraulic brake system is utilized; even if one line fails, the other can work for braking. The brake is an enclosed wet multi-plate type for reliable braking.

Others Safety Features
Retractable Seat Belt
Inclined Ladder

Environmentally Friendly Design

A Cleaner Machine
The ZW Series is equipped with a clean but powerful engine to comply with Tier 3 and Stage III A. An engine emission regulations effective in the U.S. EPA and European Union from 2006. Exhaust gas is partly re-combusted to reduce particulate matter (PM) output and lower nitrogen oxide (NOx) levels.

High-Pressure Fuel Injection System
An injection pump and an injector are paired at each cylinder to inject fuel into the cylinder at an ultra-high pressure. By electronic control of the governor, fuel injection timing and amount can precisely be controlled. This helps reduce (PM) Particulate Matter, nitrogen oxide (NOx) fuel consumption and vibration.

Important: The use of fuels other than diesel fuel (JIS K-2204) (ASTM2-D) is prohibited. Otherwise, the engine may be damaged.

A Quieter Machine
A number of features make this machine quieter. First, isochronous control of the engine speed means a restriction of engine speed during no-load and light-duty operation to suppress sound. A fan with curved blades reduces air resistance and airflow noise. Third, a time-tested muffler suppresses engine noise significantly and reduces emissions. This advanced low noise design complies with the 2000 / 14 / EC, Stage II, directive effective in the European Union from 2006.

Hitachi Silent (HS) Fan
Low Noise Engine
The HS fan is capable of reducing air resistance and air flow sound are utilized at the radiator and oil cooler for quieter operation.

A Recyclable Machine
Approximately 95% of the ZW Series can be recycled. The resin parts are marked to facilitate recycling. The machine is completely lead-free. The radiator and oil cooler are made from aluminum and all wires are lead-less. In addition, bio-degradable hydraulic oil is available for jobsites where special environmental care is required.

Full Fan Guard
The cooling fan is enclosed by a full guard (metal net) to protect service technicians from injury during servicing and maintenance.

Emergency Steering System (Optional)
The emergency electric pump delivers the necessary oil pressure for power steering even in the case of an emergency. This allows normal steering at all times even if the engine fails.
**ENGINE**

- **Model**: DM/VE-230A1
- **Type**: 4-cylinder, turbocharged, intercooled
- **Maximum power**
  - ISO 9249: 220 kW (299 PS) at 1,800 rpm
- **Cooling system**: Forced circulation type
- **Air cleaner**: Rigid type with automatic degreasing

**POWER TRAIN**

- **Transmission**: Automatic Transmission with Load-Sensing System
- **Final drive**: Pto x 2, 12 V / 75 A, 294-min. rated reserve
- **Steering system**: Four-wheel drive system
- **Breaks**: Drum brake, rear (3) / Disc brake, front (2)
- **Tyres**: 12.8R20, 13.8R24

**HYDRAULIC SYSTEM**

- **Variable Displacement Axial Plunger Pump**: Total 26˚ (+13˚, -13˚)
- **Hydraulic oil tank**: 128 mm X 166 mm
- **Oil capacity**: 200 L
- **Filter**: Full-flow 15 micron return filter in reservoir

**ELECTRICAL**

- **Alternator**: 50 A and 24-volta
- **Starting system**: Two 12-volt batteries, 75 A / 294-min. rated reserve
- **Battery charger**: 220 V (12 V / 75 A, 294-min. rated reserve)

**STANDARD EQUIPMENT**

- **Lights**: Driving with guards / Turn signals with led switch / Stop, tail and back-up lights
- **Work lights (front, rear)**
- **Engine oil cooler**
- **Monitor and alarm system, multi-function electronic audible and visual warning include**
- **Tachometer**

**ACCESSORIES**

- **Air-conditioning system**
- **Fan guard**
- **Engine oil cooler**
- **Muffler, under hood with large exhaust stack**
- **Front / Rear defroster**
- **Adjustable armrest**
- **Retractable seat belt, 50 mm**
- **Window washer**

**OPTIONAL EQUIPMENT**

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### DIMENSIONS & SPECIFICATIONS

#### General Purpose

<table>
<thead>
<tr>
<th>Bucket type</th>
<th>Standard Arm</th>
<th>Rock Bucket</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General Purpose</td>
<td>General Purpose</td>
</tr>
<tr>
<td></td>
<td>Bolt-on Teeth</td>
<td>Bolt-on Cutting edge</td>
</tr>
<tr>
<td>Bucket capacity</td>
<td>ISO heaped</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>ISO struck</td>
<td>m³</td>
</tr>
<tr>
<td>A Overall length</td>
<td>mm</td>
<td>8.950</td>
</tr>
<tr>
<td>B Overall height</td>
<td>mm</td>
<td>8.940</td>
</tr>
<tr>
<td>C Width over tires</td>
<td>mm</td>
<td>3.000</td>
</tr>
<tr>
<td>E Ground clearance</td>
<td>mm</td>
<td>3.010</td>
</tr>
<tr>
<td>F Overall length (Traveling figure)</td>
<td>mm</td>
<td>3.450</td>
</tr>
<tr>
<td>G Bucket width</td>
<td>mm</td>
<td>3.450</td>
</tr>
<tr>
<td>H Turning radius (Centerline of outside tire)</td>
<td>mm</td>
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</tr>
<tr>
<td>I Loader clearance circle, bucket in carry position</td>
<td>mm</td>
<td>7.050</td>
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<tr>
<td>J Overall operating height</td>
<td>mm</td>
<td>5.600</td>
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<tr>
<td>L Dumping clearance 45 degree, full height</td>
<td>mm</td>
<td>3.000</td>
</tr>
<tr>
<td>M Digging depth (Horizontal digging angle)</td>
<td>mm</td>
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</tr>
<tr>
<td>N Max. roll back at carry position</td>
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<tr>
<td>Static tipping load</td>
<td>kgf</td>
<td>173</td>
</tr>
<tr>
<td>Full 40 degree turn</td>
<td>kgf</td>
<td>148</td>
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<tr>
<td>Operating weight</td>
<td>kg</td>
<td>22,890</td>
</tr>
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</table>

2. Static tipping load and operating weight marked with * include 26.5-25-15PR (L3) tires (No ballast) with lubricants, full fuel tank and operator. Machine stability and operating weight depend on counterweight, tire size and other attachments. High lift Arm specification are included heavy counterweight.

#### BUCKET SELECTION GUIDE

<table>
<thead>
<tr>
<th>m³</th>
<th>General purpose 3.0</th>
<th>General purpose 4.0</th>
<th>General purpose 5.0</th>
<th>Rock bucket 3.4</th>
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<td>1200</td>
<td>1300</td>
<td>1400</td>
<td>1500</td>
<td>1600</td>
</tr>
<tr>
<td>kg / m³</td>
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<td></td>
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</tr>
</tbody>
</table>

### MEMO

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These specifications are subject to change without notice. Illustrations and photos show the standard models, and may or may not include optional equipment, accessories, and all standard equipment with some differences in color and features. Before use, read and understand the Operator’s Manual for proper operation.