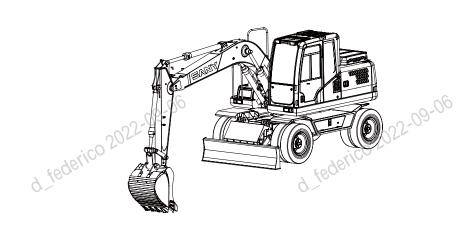
d federico 2022



Wheeled Hydraulic Excavator

SY155W



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Safety, Operation and Maintenance Manual

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WARNING

Read and follow the safety precautions and instructions in this manual and on the ma- chine decals. Failure to do can cause serious injury, death or property damage. Keep this manual with the machine for reading and future reference.

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EXEMPTION OF LIABILITY

Specific Declaration

federico 2022-09-06 Wheeled Hydraulic Excavator is a multi-purpose construction machine that is primarily used for digging or loading earth and stones. It can also be used for grading, slope-trimming, lifting, breaking, demolishing and trenching applications. The excavator is widely used in road and railway construction, bridge building, city construction, as well as airport, sea port and water conservation construction. It can also perform the function of bull dozer, loader and crane. Application other than the specified range are excluded from the scope. Sany assumes no responsibility for any consequence caused by unauthorized applications.

Sany assumes no responsibility for consequences caused by the following factors:

- · Misuse of the excavator due to failure to observe the information provided hereunder in this d federico 20 manual;
- Unauthorized restructuring or modification to the excavator;
 - Use of non-genuine parts, or untested or unapproved parts or tools;
 - Machine failure or damage resulted from natural disasters (such as earthquake, typhoon, etc.), wars and other force majeure.

Sany cannot anticipate all potential hazards that may occur on work site. Therefore, excavator operator and owner shall attach great importance to the issue of safety.

Local government may impose higher standards for use of a hydraulic excavator. If local regulations have conflicts to the safety rules described herein, whichever the stricter applies.

Obligations of Sany

- Offer quality excavators along with correct information.
- Abide by after-sales service commitment and keep a record for all maintenance work and repair work.
- Provide training for excavator operators and service persons as required.

Obligations of owners or authorized persons

- Only trained personnel who fully understand the Parts Book and the Safety, Operation and Maintenance Manual are allowed to operate and service the hydraulic excavator.
- Make sure that the excavator operator and service person are qualified for this job and know their responsibilities.
- Regularly inspect the safety awareness of related persons at work.
- Should any fault threatening safety occurs, shut down the excavator immediately.
- Sany service personnel have the right to carry out safety inspection to the excavator when required.
- Besides the checks specified by Sany, local laws and regulations on excavator shall also be observed.
 - Ensure timely maintenance and repair of the hydraulic excavator.



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Make a detailed plan for proper use of the hydraulic excavator.

Obligations of all operating personnel

- federico 2022-09-06 Any abnormalities that could bring improper operation of the hydraulic excavator or potential hazards should be reported to your supervisor. The abnormalities should be corrected timely if possible.
- All workers around the hydraulic excavator must know and obey all warning signals, and be alert to safety of oneself and others.
- All operators must know the operating items and procedures.
- Be alert to any hazardous situation and immediately inform operator and signalman of the hazards such as high voltage cables, irrelevant people and worse ground condition.

Obligations of manager

- The operator must have been trained and fully understand the provision of the Safety, Operation and Maintenance Manual. The operator must be healthy and " allowed to operate the hydraulic excavator.
- Make sure that the operator has good sense, cooperation awareness and psychological quality, or he/she is not allowed to operate or service the hydraulic excavator.
- Make sure that the signal person has good visibility and hearing ability, knows standard command signals and can give signals clearly and correctly. The signal person shall also have enough experience to recognize hazardous factors and timely tell the operator to avoid the hazards.
- Make sure that the assistant person can positively identify the model and working condition of hydraulic excavator and choose a suitable hydraulic excavator.
- Each operating personnel of a project shall bear certain safety responsibilities and is required to timely report unsafe factors to the supervisor. d federics

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Table of Contents

| Table of Contents 1 Foreword | 2022-09-06 |
|---|------------|
| inderico co coderico | 5 20 |
| d.)60 | 4.4 |
| 11 Oleword | I = I |
| 1.1 Overview | |
| 1.2 Safety Information | |
| 1.3 Page instruction | |
| 1.4 Brief Introduction | |
| 1.4.1 introduction | |
| 1.4.2 Machine directions | 1-7 |
| 1.4.3 Run-in period of a new machine | 1-7 |
| 1.5 Machine information | 1-80 |
| 1.5.1) introduction | |
| 1.4.3 Run-in period of a new machine | 1-8 |
| 1.5.3 Engine identification plate | 1-8 |
| 2 Safety | 2-1 |
| 2.1 Safety information | |
| 2.1.1 Safety signs and plates | |
| 2.1.2 Positions of safety signs and plates | |
| 2.1.3 Description of safety plates | |
| 2.2 General Precautions | |
| | |
| 2.2.1 Safety rules | 2 10 |
| 2.2.2 Aprilo mai cases | 2-10 |
| 2.2.5 Fersonal protective equipment | 2-20 |
| 2.2.3 Personal protective equipment | 2-20 |
| 2.2.6 | |
| 2.2.7 Keeping cab clean | |
| 2.2.8 Lock the hydraulic controls before leaving the cab | |
| 2.2.9 Handholds and steps | |
| 2.2.10 Elevated work | |
| 2.2.11 No sitting on attachment | |
| 2.2.12 Articulated parts | |
| 2 2 13 Prevention of hurns and scalds | 2-24 |
| 2.2.13 Prevention of burns and scalds 2.2.13.1 Hot coolant 2.2.13.2 Hot oil 2.2.14 fire and explosion prevention | 2-24 |
| 2.2.13.1 Flot Goolant | 2 25 |
| 2 2 14 fire and explosion prevention | 2 26 |
| 2.2.14 life and explosion prevention | 2 26 |
| 2.2. 14. 11 lie caused by fuel of oils | 2-20 |
| 2.2.14.2 Fire caused by flammable materials | Z-Zb |

| 00 | 00 |
|--|--------|
| 2.2.14.3 Fire caused by electric lines | 2-27 |
| 2.2.14.4 Fire caused by hydraulic lines | . 2-27 |
| 2.2.14.5 Fire caused by illumination equipment | 2-27 |
| 2.2.14.6 Fire caused by heat shield | 2-27 |
| 2.2.15 In the event of fire | |
| 2.2.16 Windshield cleaning detergent | 2-28 |
| 2.2.17 Ejecting parts | 2-28 |
| 2.2.18 Falling object protection | 2-29 |
| 2.2.19 Attachment installation | 2-29 |
| 2.2.20 Attachment combination | |
| 2.2.21 Cab windows glasses 2.2.22 Unauthorized modification 2.2.23 Worksite investigation 2.2.24 Operation on loosen ground 2.2.25 Overhead power cables | 2-30 |
| 2.2.22 Unauthorized modification | 2-30 |
| 2.2.23 Worksite investigation | 2-31 |
| 2.2.24 Operation on loosen ground | . 2-31 |
| 2.2.25 Overhead power cables | 2-32 |
| 2.2.26 Visibility | 2-33 |
| 2.2.27 Ventilation | |
| 2.2.28 Asbestos | |
| 2.2.29 Alternate exit | |
| 2.3 safe machine operation | |
| 2.3.1 safe operation precautions | |
| 2.3.1.1 Safe get in and out of the machine | 2-35 |
| 2.3.1.2 Operator seat | 2-36 |
| 2.3.1.2 Operator seat | 2-36 |
| 2.3.1.4 Before starting the engine | . 2-36 |
| 2.3.1.5 Turning on the machine safely | 2-37 |
| 2.3.1.6 Starting engine in cold season | 2-38 |
| 2.3.1.7 Necessary Auxiliary Equipment For Machine Start-up | 2-38 |
| 2.3.1.8 After starting the engine | 2-38 |
| 2.3.2 Operation | 2-38 |
| 2.3.2.1 Inspection before operation | 2-38 |
| 2.3.2.2 Prior-operation precautions | 2-39 |
| 2.3.2.3 Travel direction confirmation | 2-40 |
| 2.3.2.4 Safety rules for turning | 2-41 |
| 2.3.2.5 Safety rules for traveling | 2-42 |
| 2.3.2.6 Safe traveling | 2+43 |
| 2.3.2.4 Safety rules for turning 2.3.2.5 Safety rules for traveling 2.3.2.6 Safe traveling 2.3.2.7 Machine operation on slope | . 2-45 |
| 2.3.2.8 Operation in snowy weather | 2-45 |
| 2.3.2.9 Restricted operation | 2-46 |



| 0.00 | |
|---|----------|
| 2.3.3 Parking the machine | 2-48 |
| 2.3.3 Parking the machine | 2-48 |
| 2.3.3.2 Machine shutdown | 2-49 |
| 2.3.4 Transportation | 2-49 |
| 2.3.4.1 transportation of machine | 2-49 |
| 2.3.4.2 Loading and unloading | 2-50 |
| 2.3.4.3 Battery | |
| 2.3.4.4 Lifting objects with the machine | 2-53 |
| 2.3.5 Towing | |
| 2.4 Precautions for Maintenance | |
| 2.4.1 Prior-maintenance precautions | 2-54 |
| 2.4.1 Prior-maintenance precautions 2.4.2 Get prepared 2.4.3 Select a working area | 2-55 |
| 2.4.3 Select a working area | 2-55 |
| 2.4.4 Procedures of shutting down engines Before maintenar | nce 2-56 |
| 2.4.4 Procedures of shutting down engines Before maintenar 2.4.5 Lockout and tag-out measures | 2-57 |
| 2.4.6 Use proper tools | 2-57 |
| 2.4.7 Maintenance with engine running | |
| 2.4.8 Work under the machine | |
| 2.4.9 Track maintenance | 2-59 |
| 2.4.10 Hot cooling system | 2-60 |
| 2.4.11 High-pressure hoses | 2-60 |
| 2.4.12 Pressurized fluid | |
| 2.4.13 Welding operation | 2-62 |
| 2.4.13 Welding operation 2.4.14 Maintain Air-conditioner safely 2.4.15 High voltage precautions 2.4.16 Accumulator 2.4.17 Fire and explosion prevention | 2-62 |
| 2.4.15 High voltage precautions | |
| 2.4.16 Accumulator | 2-63 |
| 2.4.17 Fire and explosion prevention | 2-63 |
| 2.4.18 Regular replacement of safety-related parts | 2-64 |
| 2.4.19 Maintenance operation | 2-64 |
| 2.4.20 Proper disposal of wastes | 2-65 |
| 2.5 Precautions for Maintenance | 2-65 |
| 2.5.1 Prior-maintenance precautions | 2-65 |
| 2.5.2 Get prepared | 2-66 |
| 2.5.3 Select a working area | 2-66 |
| 2.5.4 Procedures of shutting down engines Before maintenar | ice 2-67 |
| 2.5.5 Lockout and tag-out measures | 2-68 |
| 2.5.6 Use proper tools | 2-68 |
| 2.5.5 Lockout and tag-out measures | 2-69 |
| 2.5.8 Work under the machine | 2-70 |
| 2.5.9 Track maintenance | |

| 06 | 00 |
|--|-------------------------|
| 2.5.10 Hot cooling system | 2-71)-09-00 |
| 2 5 11 High-pressure hoses | |
| 2.5.10 Hot cooling system | 2-72 |
| 2.5.13 Welding operation | 2-73 |
| 2.5.14 Maintain Air-conditioner safely | 2-73 |
| 2.5.15 High voltage precautions | |
| 2.5.16 Accumulator | |
| 2.5.17 Fire and explosion prevention | 2-74 |
| 2.5.18 Regular replacement of safety-related parts | |
| 2.5.19 Maintenance operation | |
| 2.5.20 Drangs diagonal of wasten | 2.76 |
| 00.06 | 00.00 |
| 3 Technical Specifications 3.1 Overall dimensions 3.3 Digging Range | 3-1 2-09 |
| 3.1 <u></u> | 3-3 |
| 3.2 Overall dimensions | 3-3 |
| 3.3 Digging Range | 3-4 |
| 3.4 Technical Parameters | 3-5 |
| | |
| 4 Operation | 4-1 |
| 4.1 Operation | 4-5 |
| 4.1.1 Machine Overview | 4-5 |
| 4.2 Controls and instruments description | |
| 4.2.1 Monitoring System | 4-6 |
| 4.2.2 Monitor operation | 4-10 09- ⁰⁰⁰ |
| 4.2.3 Switches | 4-22 |
| 4.2.3.1 Summarize | 4-22 |
| 4.2.3.2 Starting up switch | 4-22 |
| 4.2.3.3 Throttle knob | 4-24 |
| 4.2.3.4 Work lamp switch | 4-24 |
| 4.2.3.5 Horn switch | 4-25 |
| 4.2.3.6 Cabin lamps | 4-25 |
| 4.2.3.7 Cigarette lighter and auxiliary power supply | |
| 4.2.3.8 Headlamp switch | |
| 4 2 3 9 Climbing switch | 4-27 |
| 4 2 3 10 Reversing alarm release switch | 4-27 |
| 4.2.3.10 Reversing alarm release switch 4.2.4 Joystick, pedals 4.2.4.1 summurize 4.2.4.2 Safety lock lever | 4-28 |
| 4.24.1 summurize | |
| 4 2 4 2 Safety lock lever | |
| 4.2.4.3 Joysticks | Λ-20 |
| • | |
| 4.2.4.4 Brake pedal | 4-33 |

| 00 | 206 |
|---|------|
| 4.2.4.5 Accelerating pedal | 4-33 |
| 4.2.5 The steering column switch and indicator | 4-34 |
| 4.2.5.1 Summurize | 4-34 |
| 4.2.5.2 Combination switch (left lever) | 4-34 |
| 4.2.5.3 Travel combination switch (right-hand lever) | 4-36 |
| 4.2.5.4 Parking brake indicator | |
| 4.2.5.5 Operating mode indicator | |
| 4.2.5.6 High beam | |
| 4.2.5.7 Damping lock on indicator | |
| 4.2.5.8 Park / Work / Travel mode select button | |
| 4.2.5.9 Warning light switch | 4-40 |
| 4.2.5.9 Warning light switch | 4-41 |
| 4.2.6 Top window | |
| 4.2.7 windshield | 4-43 |
| 4.2.8 Cab windows and doors | 4-50 |
| 4.2.9 Cup holder | 4-51 |
| 4.2.10 Ash tray | 4-51 |
| 4.2.11 Information kits | 4-51 |
| 4.2.12 Beverage holder | 4-52 |
| 4.2.13 Emergency exit | 4-52 |
| 4.2.14 Fire extinguishers | 4-53 |
| 4.2.15 Controller | 4-54 |
| 4.2.16 Fuse piece | 4-54 |
| 4.2.17 Air Conditioning System | 4-55 |
| 4.2.17.1 Control panel | 4-55 |
| 4.2.18 Radio | 4-57 |
| 4.2.16 Fuse piece 4.2.17 Air Conditioning System 4.2.17.1 Control panel 4.2.18 Radio 4.2.18.1 Control panel | 4-57 |
| 4.2.18.2 Control buttons and liquid crystal display | 4-58 |
| 4.2.18.3 Radio operation | 4-60 |
| 4.2.19 Door locks | |
| 4.2.20 Lockable cover | 4-64 |
| 4.2.20.1 Summurize | 4-64 |
| 4.2.20.2 Open and close the cover with the lock | 4-64 |
| 4.2.20.3 Open and close the lock cover | 4-65 |
| 4.3 Operation and control of the machine | 4-66 |
| 4.3.1 Before start the engine | |
| 4.2.20.3 Open and close the lock cover 4.3 Operation and control of the machine | 4-66 |
| 4.3.1.2 Check before the start of the engine | 4-67 |
| 4.3.1.3 Adjustment before operation | |

| 00 | 00 |
|--|------------------------|
| 4.3.1.4 Operation before staring engine | 4-78) |
| 4.3.2 Start the engine | 4-79 |
| 4.3.3 Engine Preheating | 4-82 |
| 4.3.1.4 Operation before staring engine | 4-83 |
| 4.3.5 Machine operation | 4-84 |
| 4.3.5.1 summurize | |
| 4.3.5.2 Turn off the engine | 4-84 |
| 4.3.5.3 Machine travelling | |
| 4.3.5.4 work equipment control and operation | |
| 4.3.6 Actions Forbidden | |
| 4 3 7 Allowed Water Immersion Denth | 4-97 |
| 4.3.8 Operating on slopes | 4-98 09- ⁰⁶ |
| 4.3.8.1 summurize | 4-98 |
| 4.3.8.2 Engine Stalls on a Slope | 4-99 |
| 4.3.8 Operating on slopes | 4-99 |
| 4.3.9 Recommended use | 4-100 |
| 4.3.9.1 summurize | |
| 4.3.9.2 Backhoe Operation | |
| 4.3.9.3 Trenching Operation | |
| 4.3.9.4 Loading Operation | |
| 4.3.10 Parking | |
| 4.3.11 Maintenance for Daily Operation | |
| 4.3.12 Locking. 00 | 4-104 |
| 4.3.12 Locking | 4-105 |
| 4.3.13.1 Operations in Cold Environment | 4-105 |
| 4.3.13.2 Maintenance after Daily Operation | 4-105 |
| 4.3.13.3 Maintenance after Cold Season | 4-106 |
| 4.3.14 Long-term storage | 4-106 |
| 4.3.14.1 Prior to storage | |
| 4.3.14.2 During Storage | |
| 4.3.14.3 Operations After Storage | |
| 4.3.14.4 Start engine after long storage | |
| 4.4 transportation | |
| | |
| 4.4.1 Summurize | 4-108 ₁₀ |
| 4.4.3 Transportation Methods | 4-108 |
| 4.4.4 Trailers for loading and unloading machine | 4-109 |
| 4.4.4.1 summurize | 4-109 |
| 4.4.4.2 Loading | |



| 4.4.4.3 Fastening Machine | 4-111 |
|--|-----------|
| 4.4.4.4 Unloading | 4-114 |
| tegello tegello | gerio |
| 5 Maintenance | 5-1 |
| 5.1 Maintenance Information | 5-5 |
| 5.2 Oil, fuel and coolant | 5-7 |
| 5.2.1 Oil | 5-7 |
| 5.2.2 Fuel | 5-8 |
| 5.2.3 Coolant | 5-8 |
| 5.2.4 Grease | 5-9 |
| 5.2.5 Oil and fuel storage | 5-9 |
| 5.2.6 Filter element | 5-10 |
| 5.3 Electrical system | 5-10 |
| 5.2.6 Filter element 5.3 Electrical system 5.4 Wear Parts 5.5 Recommended Fuel, Coolant and Lubricant | 5-10 |
| 5.5 Recommended Fuel, Coolant and Lubricant | 5-11 |
| 5.6 Lightening Torque Table | 5-15 |
| 5.7 Safety Critical Parts | |
| 5.8 Maintenance Schedule | |
| 5.9 Maintenance Procedures | |
| 5.9.1 Initial 50 hours of operation (only the first 50 hours) | |
| 5.9.2 If required | |
| 5.9.2.1 Check and tighten the nut of wheel | |
| 5.9.2.2 Check and tighten the nut of transmission axle | 5-23 |
| 5.9.2.3 Bucket - replace | 5-24 |
| 5.9.2.4 Bucket tips - replace | 5-26 |
| 5.9.2.5 Bucket clearance - adjust | 5-28 |
| 5.9.2.6 Window washer fluid level - check/fill | 5-29 |
| 5.9.2.7 Refrigerant level - check | 5-30 |
| 5.9.2.8 Ceiling window gas spring - inspect | 5-32 |
| 5.9.3 Inspection before the Startup | 5-34 |
| 5.9.4 Every 100 service hours | 5-34 |
| 5.9.4.1 Lubrication | 5-34 |
| 5.9.4.2 Blade lubrication | 5-37 |
| 5.9.5 Every 250 service hours | 5-42 |
| 5.9.5.1 Air filter element - inspect/clean/replace | 5-42 |
| 5.9.5.2 Compressor belt tension - inspect/adjust | 5-45 |
| 5.9.5.3 Check the vehicle axle and gearbox ,oil level, add oil and check | the front |
| 5.9.5.2 Compressor belt tension - inspect/adjust | 5-46 |
| 5.9.5.4 Lubricate the transmission shaft | |
| 5.9.5.5 Lubricate front axle oscillating shaft | 5-49 |

| 06 | do |
|--|--------|
| 5.9.5.6 Lubricate front axle oscillating shaft | 5-50 |
| 5.9.6 Every 500 service hours | 5-51 |
| 5.9.6.1 Introduction | 5-51 |
| 5.9.6.2 Swing bearing - lubricate | 5-51 |
| 5.9.6.3 Engine pan oil and filter element - change/replace | |
| 5.9.6.4 Check the height of the grease in the rotating pinino and add | |
| grease | 5-53 |
| 5.9.6.5 Primary fuel filter element - replace | |
| 5.9.6.6 Secondary fuel filter element - replace | |
| 5.9.6.7 Radiator and oil cooler fins - inspect/clean | |
| | |
| 5.9.6.9 Swing drive oil level - check/fill | 5-64 |
| 5.9.7 Every 1000 service hours | . 5-65 |
| 5.9.6.8 Air conditioner fresh air/recirculation filter - clean 5.9.6.9 Swing drive oil level - check/fill 5.9.7 Every 1000 service hours 5.9.7.1 Introduction 5.9.7.2 Hydraulic oil return filter element - replace 5.9.7.3 Swing drive oil - change | . 5-65 |
| 5.9.7.2 Hydraulic oil return filter element - replace | 5-65 |
| 5.9.7.3 Swing drive oil - change | 5-67 |
| 5.9.7.4 Cab door lock and front window lock catch - inspect/tighten | 5-68 |
| 5.9.7.5 Cab door hinge and front window slide rail - inspect/add grease | 5-69 |
| 5.9.7.6 Windshield wiper arm nut - Inspect/tighten | 5-70 |
| 5.9.7.7 Engine exhaust pipe clamps - check | 5-70 |
| 5.9.7.8 Fan belt tension - check/replace | 5-70 |
| 5.9.7.9 Nitrogen pressure in accumulator (breaker) - check | 5-70 |
| 5.9.7.10 Breather valve - service | |
| 5.9.8 Every 2000 service hours | 5-72 |
| 5.9.8.1 Introduction | . 5-72 |
| | |
| 5.9.8.3 Check the nitrogen pressure in the accumulator | |
| 5.9.8.4 Cooling system interior - clean | |
| 5.9.8.5 Alternator - inspect | 5-77 |
| 5.9.8.6 Engine valve clearance - check/adjust | |
| 5.9.9 Every 4000 service hours | |
| 5.9.9.1 Introduction | |
| 5.9.9.2 Water pump - inspect | 5-78 |
| 5.9.9.3 Start motor - check | 5-78 |
| 5.9.9.3 Start motor - check | 5-79 |
| 5.9.9.5 Accumulator - replace | . 5-80 |
| | |
| 5.9.9.7 Compressor working condition - inspect | |
| 5.9.10 Every 8000 service hours | 5-82 |



| 5.9.10.1 Introduction 5.9.10.2 High-pressure tube clam | 0.09.06 | 5.82 |
|---|-----------------|--------|
| 5.9.10.2 High pressure tube clam | ne renlace | 5-82 |
| 5.9.11 Every 10000 service hours | ps - replace | 5-02 |
| 5.9.11 Every 10000 service hours | | J-02 |
| 6 Troubleshooting | | 6-1 |
| 6.1 Special introduction | | |
| 6.1.1 Special introduction | | 6-3 |
| 6.2 Troubleshooting Preparation | | 6-4 |
| 6.2.1 Checks before troubleshooting |] | 6-4 |
| 6.2.2 Troubleshooting precautions | | 6-5 |
| 6.2.3 Electrical circuits troubleshoot | ing precautions | 6-6 |
| 6.2.4 Hydraulic components handlin | g precautions | 6-7.06 |
| 6.3 Engine Failures | | 6-8 |
| 6.3.1 Engine troubleshooting table | aico re | 6-8 |
| 6.3 Engine Failures | <i>y</i> o. | 6-12 |
| 6.3.3 Engine oil pressure low | | 6-13 |
| 6.3.4 When fuel runs out | | 6-14 |
| 6.3.5 When engine rotates reversely | / | 6-15 |
| 6.4 Failures of the Electrical System | | 6-15 |
| 6.4.1 Electrical system troubleshoot | ing table | 6-15 |
| 6.4.2 Failure codes | | 6-18 |
| 6.4.3 Battery | | 6-20 |
| 6.4.3.1 Introduction6.4.3.2 Battery removal and instal | 20 | 6-20 |
| 6.4.3.2 Battery removal and instal | lation | 6-21 |
| 6.4.3.3 Battery charging | 2024 | |
| 6.4.3.4 Starting engine with jumps | er cable | 6-22 |
| 6.5 Failures of the Hydraulic System | | 6-24 |
| 6.5.1 Failures of the Hydraulic Syste | | |
| 6.6 Other Common Failures | | 6-29 |
| 6.6.1 Other Common Failures | | 6-29 |





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Foreword

| (10) | | |
|--------------------------|------------------------|----------|
| 1 Foreword | 09-0 | 1-1 |
| 1.1 Overview | g jogetico 50 tr 00-00 | 1-3 |
| 1.2 Safety Information | tege _{llo} | 1-4 |
| 1.3 Page instruction | 97, | 1-6 |
| 1.4 Brief Introduction | | 1-6 |
| | | |
| | ons | |
| 1.4.3 Run-in period of | a new machine | 1-7 |
| 1.5 Machine information. | | 1-8 |
| 1.5.1 introduction | | 1-8 |
| 1.5.2 Product identific | ation plate | 1-8 |
| 1.5.3 Engine identifica | ation plate | 1-8 % |
| 1.5.3 Engine Identifica | ation plate | 2022-09 |
| derico | derico | derico L |
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WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operation or maintaining it. Failure to do this could result in death or serious injury. d federico 2002

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1.Foreword

1.1 Overview

d federico 2022-09-06 d_federico 2022-09-06 This Operation and Maintenance Manual is a guide for you to operate your machine properly. It contains technical and safety information necessary for operation of your machine. Please read and understand each section of the manual.

Only eligible and experienced operators with an official license (according to local laws) are allowed to operate the machine.

Always operate your machine according to national and/or local laws and regulations. The operation safety information and description in this manual are just suggestive and attentive.

Sany cannot anticipate every possible circumstance that might involve a potential hazard during operation and maintenance. The Safety messages in this manual and on the product are, therefore, not all inclusive. If a procedure, work method or operating technique that is not specifically recommended in this manual is used, you must be sure that it is safe for you and for others.

Modifying or abusing the machine according to your own will might impair the machine's performance, or result in more serious potential hazard. For instance, the specific volume of fuel oil exceeds set limit or the machine is overloaded. Please drive and operate the machine carefully. Improper operation or application may cause personal injury or damage. Sany assumes no responsibility for such losses.

Machines covered by this manual are used for various operations under normal conditions. Do not use the machine in flammable or explosive environment, or in areas containing asbestos dust.

Please select a Sany excavator with a configuration suitable for high-plateau operation when operating in areas 2,000 m above sea level.

This machine has gone through electromagnetic capacity test according to EN 13309-200C. All unapproved electronic attachments (such as communication devices) are therefore to be tested before installation and application. Make sure that the electromagnetic attachments will not cause electromagnetic interference.

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. Sany reserves the right to change this information at any time without prior notice. Please consult Sany dealer to obtain the latest information or if you have any question on the information provided in this manual.

Machine with standard configuration suitable for work under 2000m altitude, atmospheric temperature ranging from -20°C to 40°C d federico 202 d federico 20° ture ranging from -20°C to 40°C. d federic



A CAUTION

Before starting operation and maintenance, operator and maintainer shall observe the following items:

- Read and understand the whole manual.
- Read and understand the safety notices contained in this manual and the safety messages on the machine.
- Do not apply or operate your machine under any circumstances in a manner that is prohibited in this manual.
- If the amount of fuel added, content of particles, or latitude is beyond the specification of this type of machine, damage could occur and the warranty of your machine would become invalid.
- The manual should be kept in the cab all the time for operator to refer to at any time.
- Please contact Sany dealer to obtain a new manual if the original one is missing or cannot be read.
- This manual should be regarded as a permanent component of your machine. If the machine is sold to a third party, please give this manual to the new owner.
- The machine provided by Sany to its buyer is in line with all specifications and standards of buyer's country. If the machine is purchased from another country or someone of a third country, it might be lacking of some safety devices or technical requirements necessary for using the machine in your country. In case you question whether the machine is in accordance with the standards and specifications of your country, please contact Sany dealer before operating the machine.

1.2 Safety Information

For your safety during operation this machine, Safety precautions are given in this manual and warning decals, both textual and graphical, are adhered to various parts on the machine to provide information of hazardous situations and the method to avoid such situations.

Before conducting operation and maintenance on the machine, the operator and after-sale service personnel must understand all warning signs or symbols on the machine decals, strictly follow the safety rules and precautions in this manual, and take positive actions so as to reduce the risk of personal injury and death, the damage of machine caused by improper service, and the risk of unsafe factors, to the minimum.

Hazard Alert

Hazard alert words are used in this manual and on some of the machine decals to inform the operator of imminent or potential hazard that lead to death, personal injury or property damage, different alert words are used to indicate the degree of hazard.

Three hazard warning words are applied in the manual, DANGER, WARNING and CAUTION. Their meanings are indicated as below.



It indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

It indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

It indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate in- jury. It can also be used to alert unsafe operation as which may cause property loss.

An example alert wording and alert text

▲ WARNING

- The lockout lever must be placed in the locked position before leaving the cabin.
- A free control lever can cause serious injury or death if touched by mistake.

Safety decals

Safety decals are fixed to the machine to alert the operator or maintenance workers that potential danger might be involved when operating or servicing the machine.

The machine uses textual and graphical (or combined) decals to indicate hazardous situation and safety measures.

a. Example of textual safety decals

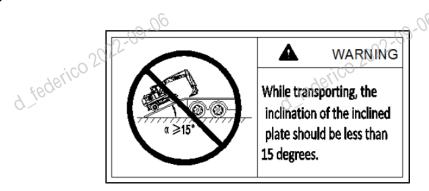


Fig.1-1



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b. Graphical safety decals

Graphical safety decals use images or symbols to indicate a hazardous situation and how to avoid it.

The upper triangle indicates the type of hazardous situation while the lower circle indicates the way to avoid it.

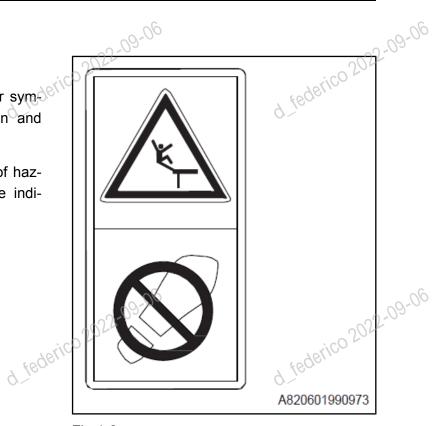
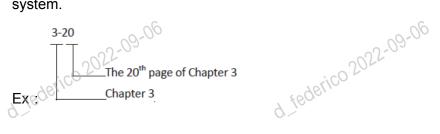


Fig.1-2

1.3 Page instruction

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The instruction applies the relative page system.



1.4 Brief Introduction

1.4.1 introduction

Sany hydraulic excavators are designed for following operations

Excavating

:ico 5055-09-06 Leveling

Ditching

Loading

Demolishing



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Figures in photos are coincide with figures inside [] symbol in articles. (Ex : 1 → [1])

All measurements in this brochure applied with international standard (C)

1.4.2 Machine directions

In this manual, the front, rear, left or right direction indicates, when the cab faces the front and the final drive is behind of the machine. the moving direction that you could see from the cab.

- [A] Front
- d fed(B) Rear
 - 【C】Left
 - 【D】 Right
 - 【E】 Cabin
 - (F) Dozer

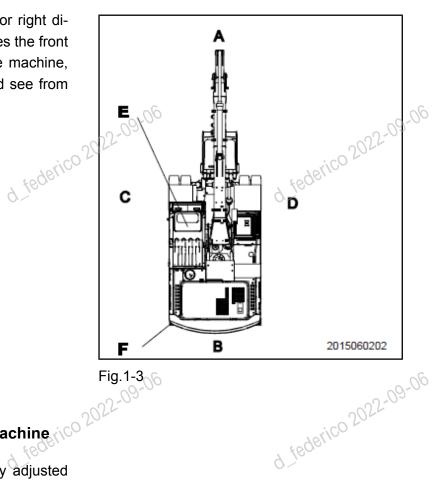


Fig.1-3

1.4.3 Run-in period of a new machine

Your machine has been thoroughly adjusted and tested before shipment. However, initial operation of the machine under severe conditions can adversely affect the performance of the machine or shorten the machine life.

Please follow the instructions for the first 100 hours' run- in operation for a new machine. (Refer to the working hours indicate of the

Please make sure you are fully aware of the contents of this brochure, and follow the structions to structions below:



machines for 3 to 5 minutes, during this period, do not operate the joysticks and fuel control knob, then stort 2-09-06 speed up to 1200 RPM with slow operation, until the water temperature reached around 60°C.

Avoid heavy load operation under a high speed operation. Avoid sudden acceleration, unnecessary sudden stop and sudden change d_federico 2022-09-06 of direction after the engine turned on.

1.5 Machine information

1.5.1 introduction

Please provide with under listed information to authorized distributors when maintenance or purchase of spare parts.

1.5.2 Product identification plate

On the right side of the operator's cab on the bottom.

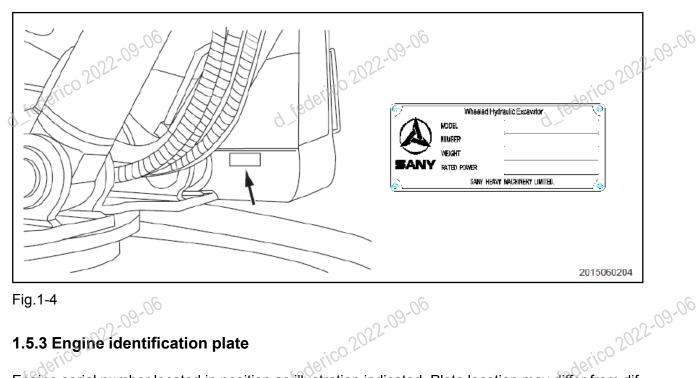


Fig.1-4

1.5.3 Engine identification plate

Engine serial number located in position as illustration indicated. Plate location may differ from different engine model. ISUZU Engine



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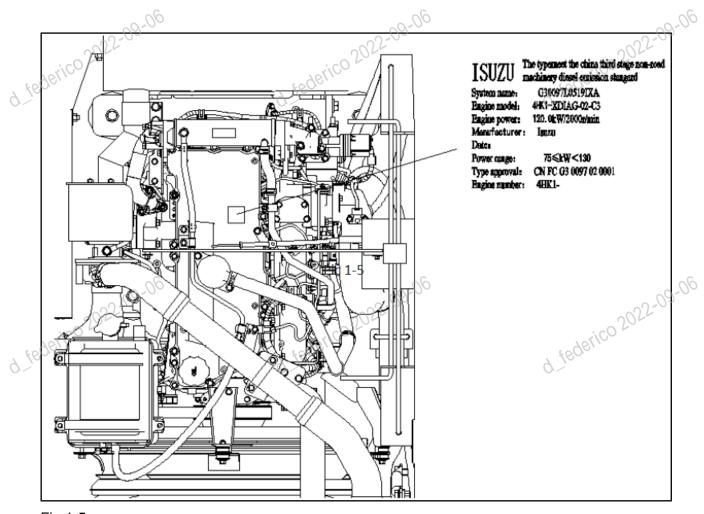


Fig.1-5

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Safety

| 2 Safety | 2-1 |
|--|------|
| 2.1 Safety information | 2-7 |
| 2.1.1 Safety signs and plates | 2-7 |
| 2.1.2 Positions of safety signs and plates | 2-7 |
| 2.1.3 Description of safety plates | |
| 2.2 General Precautions | |
| 2.2.1 Safety rules | |
| 2.2.2 Abnormal cases | |
| 2.2.3 Personal protective equipment | |
| 2.2.4 Fire extinguisher and first aid kit | |
| 2.2.5 Safety equipment | 2-21 |
| 2.2.5 Safety equipment | 2-21 |
| 2.2.7 Keeping cab clean | 2-22 |
| 2.2.8 Lock the hydraulic controls before leaving the cab | 2-22 |
| 2.2.8 Lock the hydraulic controls before leaving the cab | 2-23 |
| 2.2.10 Elevated work | 2-24 |
| 2.2.11 No sitting on attachment | 2-24 |
| 2.2.12 Articulated parts | |
| 2.2.13 Prevention of burns and scalds | 2-24 |
| 2.2.13.1 Hot coolant | 2-24 |
| 2.2.13.2 Hot oil | 2-25 |
| 2.2.14 fire and explosion prevention | 2-26 |
| 2.2.14.1 Fire caused by fuel or oils | 2-26 |
| 2.2.14.1 Fire caused by fuel or oils | 2-26 |
| 2 2 14.3 Fire caused by electric lines. | 2-27 |
| 2.2.14.4 Fire caused by hydraulic lines | 2-27 |
| 2.2.14.4 Fire caused by hydraulic lines | 2-27 |
| 2.2.14.6 Fire caused by heat shield | |
| 2.2.15 In the event of fire | 2-28 |

| 20 | 200 |
|--|-------------------|
| 2.2.16 Windshield cleaning detergent | 2-28 -09-00 |
| 2.2.17 Fiecting parts | 2-28 |
| 2.2.18 Falling object protection | 2-20 |
| 2.2.19 Attachment installation | 2-29 |
| 2.2.20 Attachment combination | |
| 2.2.21 Cab windows glasses | |
| 2.2.22 Unauthorized modification | |
| 2.2.23 Worksite investigation | |
| 2.2.24 Operation on loosen ground | |
| 2.2.25 Overhead power cables | |
| 2 2 26 Visibility | 2-33 |
| 2.2.27 Ventilation | 2-34 |
| 2.2.28 Aspestos | 2-34 |
| 2.2.29 Alternate exit | 2-35 |
| 2.2.27 Ventilation 2.2.28 Asbestos 2.2.29 Alternate exit 2.3 safe machine operation 2.3.1 safe operation precautions | |
| 2.3.1 safe operation precautions | 2-35 |
| 2.3.1.1 Safe get in and out of the machine | 2-35 |
| 2.3.1.2 Operator seat | |
| 2.3.1.3 Seat belt | |
| 2.3.1.4 Before starting the engine | 2-36 |
| 2.3.1.5 Turning on the machine safely | 2-37 |
| 2.3.1.6 Starting engine in cold season | 2-38 |
| 2.3.1.7 Necessary Auxiliary Equipment For Machine Start-up | 2-38 |
| 2.3.1.8 After starting the engine | 2-38 |
| 2.3.2 Operation | 2 ₇ 38 |
| 2.3.2.1 Inspection before operation | 2-38 |
| 2.3.2.2 Prior-operation precautions | 2-39 |
| 2.3.2.3 Travel direction confirmation | 2-40 |
| 2.3.2.4 Safety rules for turning | 2-41 |
| 2.3.2.5 Safety rules for traveling | 2-42 |
| 2.3.2.6 Safe traveling | |
| 2.3.2.7 Machine operation on slope | |
| 2.3.2.8 Operation in snowy weather | 2-45 |
| 2.3.2.9 Restricted operation | 2-46 |
| 2.3.3 Parking the machine | 2-48 |
| 2.3.3 Parking the machine 2.3.3.1 Select a parking place 2.3.3.2 Machine shutdown 2.3.4 Transportation 2.3.4.1 transportation of machine | 2-48 |
| 2.3.3 Machine shutdown | 2-49 |
| 2.3.4 Transportation | 2-49 |
| 2.3.4.1 transportation of machine | 2-49 |
| 2.3.4.2 Loading and unloading | |
| 2.3.4.3 Battery | 2-51 |

| | 0.06 | 0.0 |
|---------|--|------|
| | 2.3.4.4 Lifting objects with the machine | 2-53 |
| | 2.3.5 Towing | 2-54 |
| 402° | 4 Precautions for Maintenance | 2-54 |
| 9, | 2.4.1 Prior-maintenance precautions | 2-54 |
| | 2.4.2 Get prepared | |
| | 2.4.3 Select a working area | 2-55 |
| | 2.4.4 Procedures of shutting down engines Before maintenance | 2-56 |
| | 2.4.5 Lockout and tag-out measures | 2-57 |
| | 2.4.6 Use proper tools | 2-57 |
| | 2.4.7 Maintenance with engine running | 2-58 |
| | 2.4.8 Work under the machine | 2-59 |
| | 2.4.9 Track maintenance 2.4.10 Hot cooling system 2.4.11 High-pressure hoses 2.4.12 Pressurized fluid 2.4.13 Welding operation | 2-59 |
| | 2.4.10 Hot cooling system | 2-60 |
| | 2.4.11 High-pressure hoses | 2-60 |
| 4 fede | 2.4.12 Pressurized fluid | 2-61 |
| 0. | 2.4.13 Welding operation | 2-62 |
| | 2.4.14 Maintain Air-conditioner safely | 2-62 |
| | 2.4.15 High voltage precautions | |
| | 2.4.16 Accumulator | |
| | 2.4.17 Fire and explosion prevention | 2-63 |
| | 2.4.18 Regular replacement of safety-related parts | |
| | 2.4.19 Maintenance operation | |
| | 2.4.20 Proper disposal of wastes | 2-65 |
| 2. | 5 Precautions for Maintenance | 2-65 |
| | 2.5.1 Prior-maintenance precautions | 2-65 |
| 10' | 2.5.2 Get prepared | 2-66 |
| 4 18016 | 2.5.2 Get prepared | 2-66 |
| 0.7 | 2.5.4 Procedures of shutting down engines Before maintenance | 2-67 |
| | 2.5.5 Lockout and tag-out measures | |
| | 2.5.6 Use proper tools | |
| | 2.5.7 Maintenance with engine running | |
| | 2.5.8 Work under the machine | 2-70 |
| | 2.5.9 Track maintenance | |
| | 2.5.10 Hot cooling system | 2-71 |
| | 2.5.11 High-pressure hoses 2.5.12 Pressurized fluid | 2-71 |
| | 2.5.12 Pressurized fluid | 2-72 |
| | 2.5/13 Welding operation | 2-73 |
| . 46 | 2.5.14 Maintain Air-conditioner safely | 2-73 |
| 9 1600 | 2.5.15 High voltage precautions | 2-73 |
| | 2.5.16 Accumulator | 2-74 |
| | 2.5.17 Fire and explosion prevention | |

| 00-00 | ~0 | -00 | ,~O' |
|--------------------|----------------------------------|------|------|
| 2.5.18 Regular rep | lacement of safety-related parts | 2-75 |) |
| 0/// | e operation | 0// | |
| (10 | osal of wastes | 2-76 | |
| 9 10=101=01 1100 | 970 | 970 | |

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WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operation or maintaining it. Failure to do this could result in death or serious injury. d federico 202

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2.Safety

2.1 Safety information

2.1.1 Safety signs and plates

Below listed alerting signs and safety plates are implemented on machine

- Please be fully aware of the right position and contents of the signs and plates.
- To ensure the plates and signs clear to read, please make sure they are on proper positions and keep them clean. Please do not use organic solvents or gasoline while cleaning, or paints of the plates may peel.

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- Please treat the plates with the same solution above mentioned other than alerting signs and safety plates.
- Please change the plate with a new one if signs or plates are broken or unable to read. Please refer to this brochure or the signs or plates about part number of related plates or signs.

2.1.2 Positions of safety signs and plates

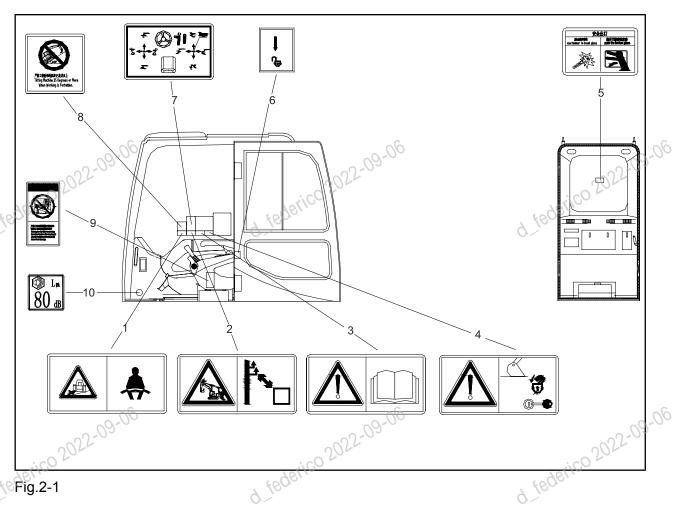


Fig.2-1

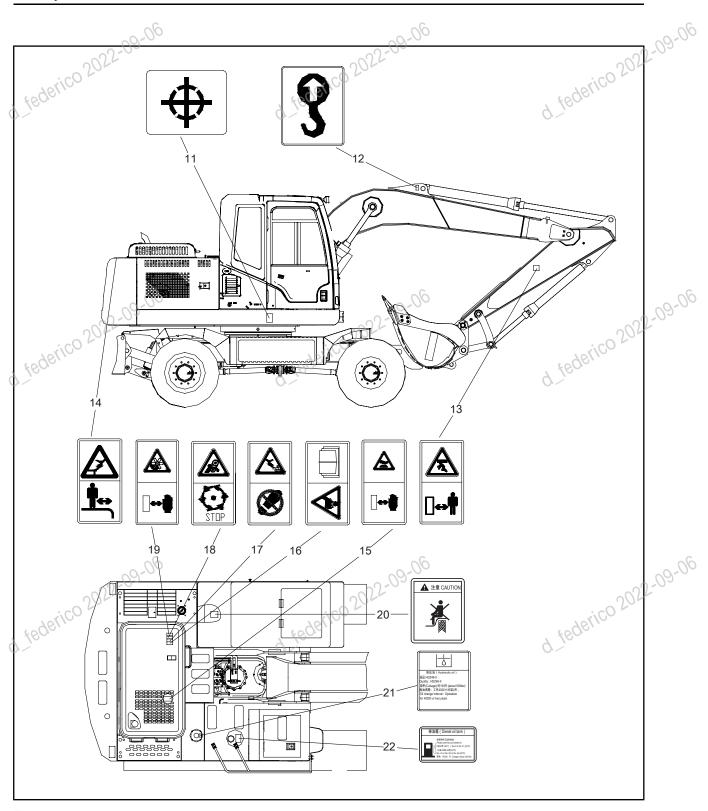


Fig.2-2

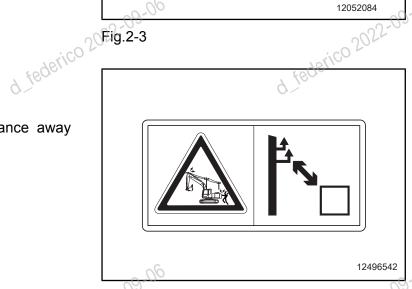
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2.1.3 Description of safety plates

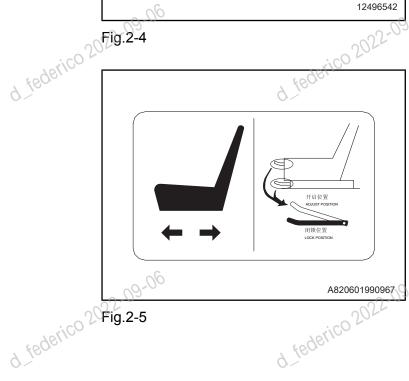
1. Buckle up



- Electrocution hazard.
- Electron
 Kr · Keep the machine a safe distance away from overhead power lines.



3 Cabin seat adjustment



- Read the Operation and Maintenance Manual prior to operation, maintenance sembly, assembly. machine

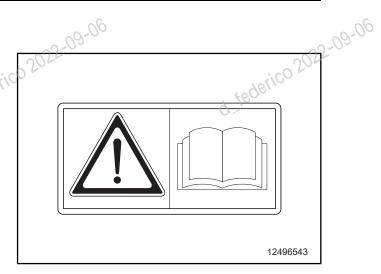
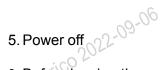


Fig.2-6



 Before leaving the machine, lower the work equipment to the ground, secure the lockout lever in the LOCKED position and remove the ignition key

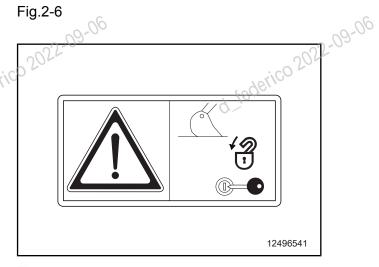


Fig.2-7

d federico 2022 6. Safety emergency exit sign

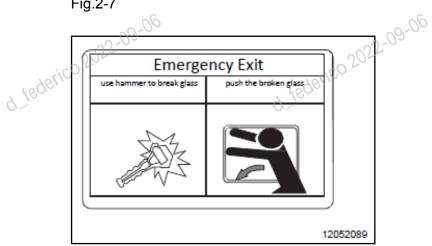


Fig.2-8

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7. Lock the front window

- Personal injury may occur if the front window is not latched in the overhead position
 - When the front window is raised, be sure to secure it with the lock pin



Fig.2-9

d federico 20 8. Cab door lock

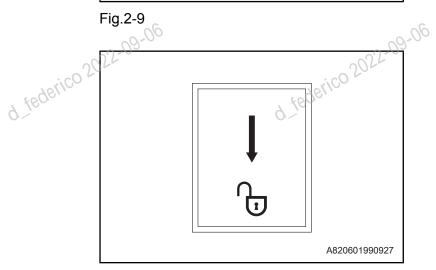


Fig.2-10

9. Excavator control signs

 To prevent personal injury or death accident, when operating the machine, please check the machine running state and mode of operation from screen panel, please pay attention to the surrounding environment, cautiously operate.

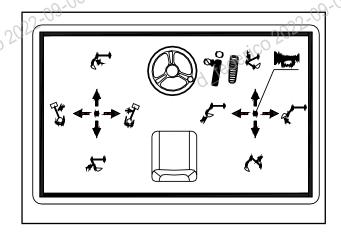


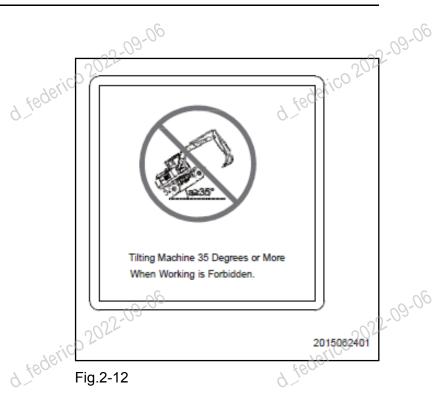
Fig.2-11

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10. Tilting working restriction signs

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11. Entering the Cab With Handholding Operation Handle or Running Control Lever is Forbidden Otherwise, it Will Cause Parts Damage

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Fig.2-13

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12.Noise level signs d federico 13.Gravity center signs d federico 20 14.Lifting point ang po

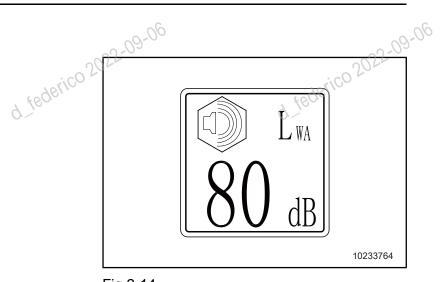


Fig.2-14

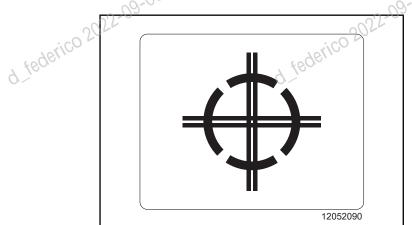


Fig.2-15

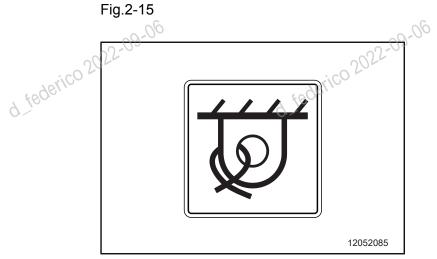


Fig.2-16

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15.Central joint greasing refill inlet warning d federicc

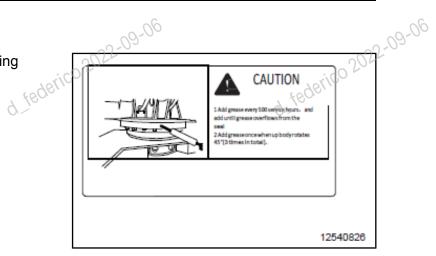


Fig.2-17

16. Transport anchor point d federico 2022

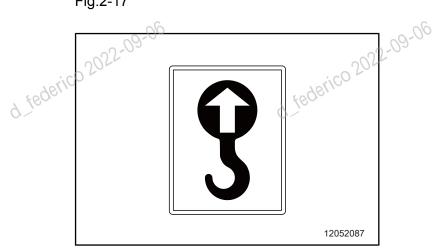


Fig.2-18

- 17. No entering in to surrounding area

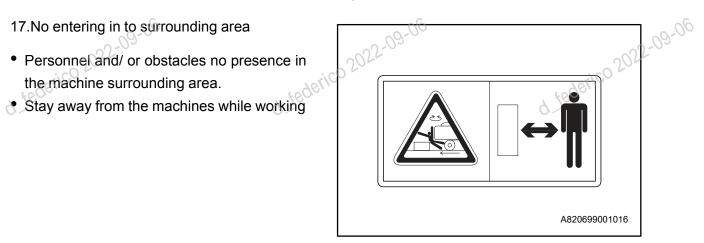


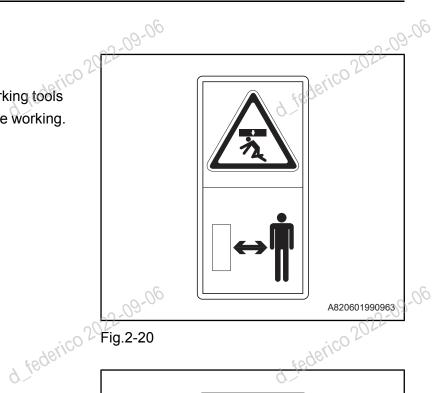
Fig.2-19

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18.Mind the working tools

- Potential risk of being hurt by working tools
 - Stay away from the machine while working.



d 19. Falling off warning

- · Risk of falling off.
- Do not stand close to the edge of the platform.



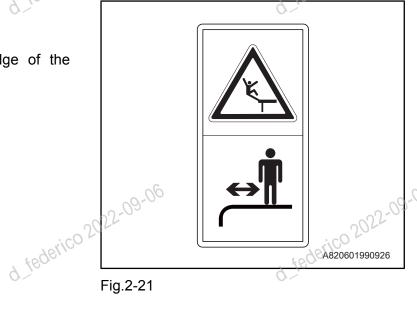
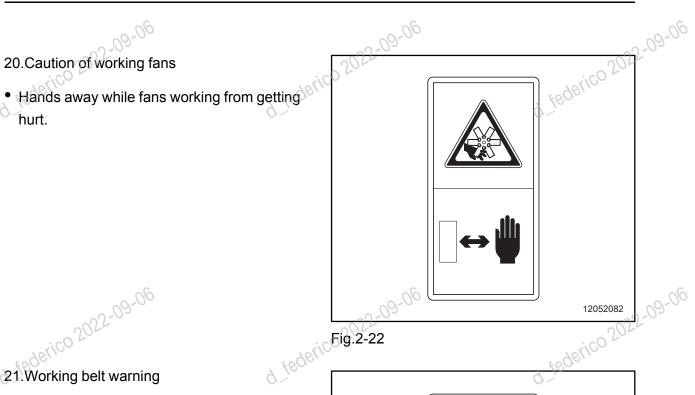


Fig.2-21

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2derico 2022-09-06 21. Working belt warning

- Caution working belt.
- Stop the belt before maintenance.

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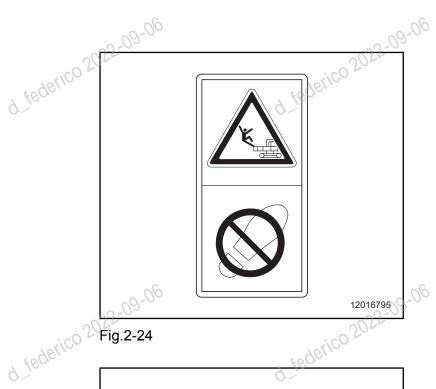


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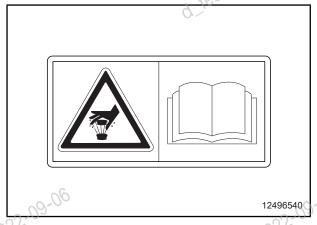
22. No standing around sign

Risk of falling off, do not step on



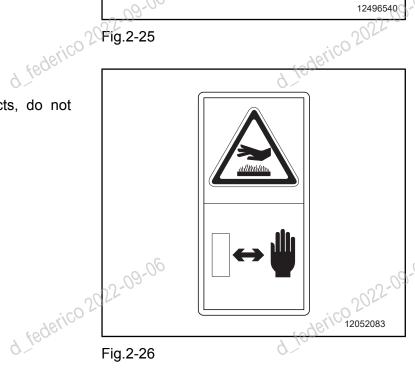
d federico 2022-09-06 23.Anti-spilting sign

• Release the pressure and open the cap slowly before opening up the fuel tank cap or any caps of containers in case of spilting, follow the instructions from the operation manual strictly.



3rico 2022-09-06 24.Hot objects warning

> • To prevent hurt from hot objects, do not touch any of them





2-18

d. federico 2022-09-06 J. federico 2022-09-06 25.No sitting down sign d federico CAUTION federico 2022-09-06 A820699001023 d jederic Fig. 2-27 federico Z 26. Hydraulic oil warning sign Hydraulic oil tank 0il brand:A₩46 (-10°C≤T≤30°C) or AW32 (-20°C≤T≤20°C) Cubage:about150liter Clean grade: NAS 8 Jerico 2022-09-06 rico 2022-09-06 Fig.2-28 A820601991075 27 Diesel tank warning sign Diesel oil tank No. 10 or No. 20 or No. 35 (≤0°C) Fig.2-299 d_federico 2022-09-06 d_federico 2022-09-06

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2.2 General Precautions

2.2.1 Safety rules

- d. federico 2022-09-06 · Only trained personnel are allowed to operate and service the machine.
- All safety rules, precautions and instructions must be followed when operating and servicing the machine.
- · Taking alcohol or drug could seriously impair one's ability in operating or repairing the machine, and it is hazardous for you
- When working with another operator or worksite traffic signalman be sure to all people understand all hand signals to be used.

2.2.2 Abnormal cases

In case of any abnormalities found during operation and maintenance, such as noise, vibration, odor, incorrect gauge display, smoke, or oil leakage, notify your Sany dealer and 2.2.3 Personal protective equipment

Wear proper work closs
text:

tective equipment (PPE) suitable for the environment of the worksite. You may need:

- Hard hat
- Safety shoes
- Safety glasses, goggles or face shield
- Protective gloves
- Hearing protection
- Reflective clothing
- Respirator or filter masker

Wear whatever is needed, and other safety equipment that the employer, public service



Fig.2-30



manage department (or government), rules and regulations request. Do not take chances.

A CAUTION

- Do not wear loose fitting clothes and decorative ornaments, which can easily catch on control lever or other protruding parts.
- Long hair outside safety hat may be caught by machine. In this case, long hair should be made into a bun to avoid being entangled by machine.
- Always wear safety hat and safety shoes.
 In operation or maintenance of machine, if the job requests, wear safety glasses, face shield, gloves, ear protection and seat belt.
- Check all protective devices for proper functioning prior to operation.

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2.2.4 Fire extinguisher and first aid kit

To prevent injury or fire, observe the following precautions:

- First aid kit and fire extinguisher should be available nearby.
- Read and understand the instruction attached to fire extinguisher. Use fire extinguisher properly.
- Regular inspection and maintenance shall be done to ensure proper functioning of fire extinguisher at any time.
- Check the first aid kit regularly and replenish it when necessary.
- Make emergency scheme to deal with fire and accidents.

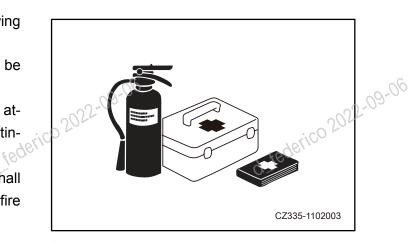


Fig.2-31





2.2.5 Safety equipment

To protect you and others around you, your machine may be equipped with the following safety equipment. Make sure that they are securely in place and in good condition.

- Falling object protective structures (FOPS)
- Front guard
- Protective pads
- Lamps
- Safety signs
- Horn
- Travel alarm
- Mirrors
- Fire extinguisher
 - First aid kit
 - Rain wipers

CAUTION

- Make sure all guards and covers are in correct position. Repair any damaged parts immediately once observed.
- Understand the operating methods of safety equipment and use them correctly.
- Jederiko 2022-09-06 Never remove the front guard of cab except for service.

2.2.6

- Clean the windshields, mirrors and lights. Make sure that the operating area, steps and handholds are free from oil, grass, snow, ice or mud, which can cause you to slip and fall. Clean the mud on your soles before getting on the machine.
- If the machine is checked or serviced with you to slip or fall, or dirt may get into your eyes. Keep the machine
 - If water has penetrated into the electrical system, do not rush to power on your

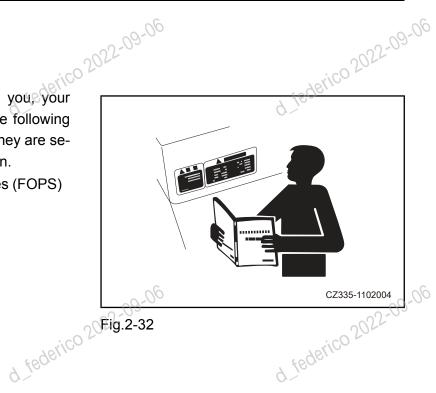




Fig.2-33



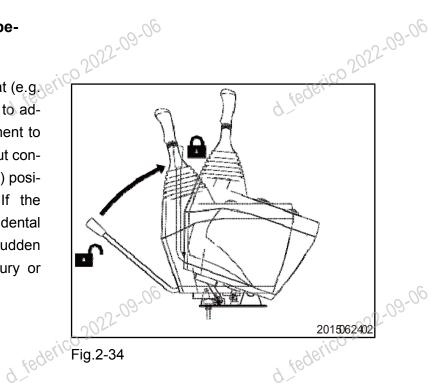
machine failure or cause damage to the electrical system. Do not flush the electrical system (including sensors tors, etc.) with wot-

2.2.7 Keeping cab clean

- Clean the mud and oil on your soles when getting into the cab. Mud or oil under your shoes can cause your foot to slip on the
- objects from the operator's area. Secure these items in the tool box or remove the from the machine Remove all loose personal items or other these items in the tool box or remove them
- Do not use cellular phone when operating or driving the machine.
- · Do not bring hazardous articles, such as flammable or explosive products, into the cab.

• Before you rise from the operator seat (e.g. to open or close the front window or the just the seath ' to open or close the front window or to adthe ground, move the hydraulic lockout control lever [1] from F (free) to L (locked) position, and then stop the engine. If the hydraulic control is not locked, accidental touching of control levers can cause sudden machine movement and serious injury or machine damage. d tegelico 5055-06

2-22



 Before leaving your machine, always lower the work equipment to the ground, place the hydraulic lockout control lever [1] to the L (locked) position, and then shut down the engine. Lock all lockable components and remove the key.

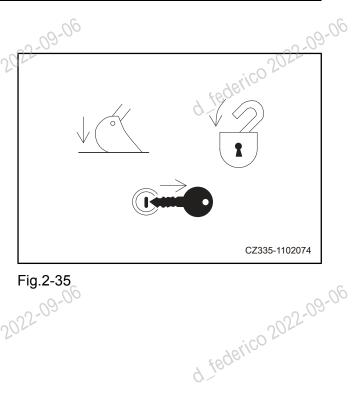


Fig.2-35

2.2.9 Handholds and steps

CAUTION

- Face the machine whenever you mount or dismount the machine.
- Never jump on/off the machine. Do not mount a moving machine. Do not jump onto the machine and try to stop it.
- The cab must be aligned with the undercarriage center line before you enter or exit the cab.

To avoid personal injuries due to slipping or falling off the machine, follow the instructions below:

- · Before mounting or dismounting the machine, check the handholds and steps (including track shoe). If oil, grease or mud is observed on handholds or steps (including track shoe), remove it immediately. Keep these components clean. Repair them in case of any damage. Tighten loosen bolts.
- Use handholds and steps when mounting or dismounting the machine.
- Face the machine and maintain a threepoint contact (two feet and one hand or two hands and one foot) with the handholds or step (including track shoe).



Fig.2-36

- Do not try to mount or dismount the machine.
 Do not mount or dismount the machine when you carry tools or supplier.
 Do not mount +-
- without a non-slip mat.

2.2.10 Elevated work

When working in a high place, use ladders or federico 2022-09-06 other supporting devices to ensure safe operation.

2.2.11 No sitting on attachment

To avoid falling hazard, no one is allowed to sit on work equipment or other machine attachments.

2.2.12 Articulated parts

The space around work equipment changes with the movement of the linkage. Serious 2.2.13 Prevention of burns and scalds

2.2.13.1 Hot coolant personal injury will result if one is stuck in be-

- To prevent scalds caused by hot coolant or steam when checking or discharging the coolant, always wait for the engine.
- Do not open the cap of radiator before the engine cools down. Loosen the cap of the radiator slowly before removing it. Internal pressure of radiator must be relieved to avoid serious scalds. d feder



Fig.2-37



2.2.13.2 Hot oil

To prevent scalds caused by hot oil when checking or discharging the oil, always wait for the engine oil to cool down before you proceed.

When the engine has cooled down, loosen the cover or screw plug slowly to relieve internal pressure.

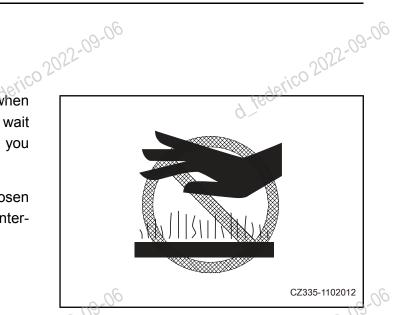


Fig. 2-38 Fig.2-39 d. federico 2027 d_federico 2022-09-06 CZ335-1102013

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- 2.2.14.1 Fire caused by fuel or oils

 Machine oil or fuel oil must ' ignator' ignated place, where unauthorized persons cannot enter.
- Do not smoke or use fire near fuel or machine oil.
- Tighten, repair or replace any missing, loose or damaged pipe clips, pipelines, hoses, oil coolers or other flange bolts.
- Refuel or store oils in a place with good ventilation.
- Shut down the engine before refueling.
- Do not leave the machine when refilling the fuel or machine oil.
- Do not let fuel overflow onto overheated surface or electrical components.
- Remove overflowed fuel or machine oil after refilling.
- Store oily rags and flammable materials properly to keep the job-site safe.
- Screw on the caps of fuel tank and oil tank tightly.
- When oil is used to clean the parts, use non-flammable oil. Do not use diesel oil or gasoline as they can easily catch on fire.
- All flammable materials should be moved to a safe place before carrying out grinding or welding operation on the chassis.
- · Do not weld or flame cut the lines containing flammable fluid.

2.2.14.2 Fire caused by flammable materials

chips, paper pieces, dirt and other flamma-ble materials built up or stuck on engin Remove at any time dry leaves, wood ble materials built up or stuck on engine, exhood to prevent fire.

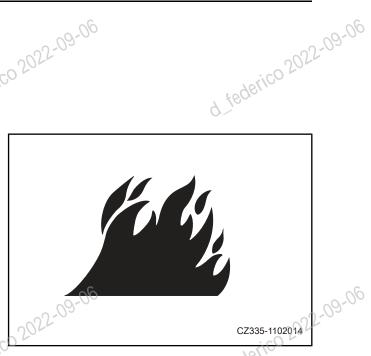


Fig.2-40



Fig.2-41



2.2.14.3 Fire caused by electric lines

Short circuit of electrical system can cause fire.

- Keep electric terminals clean and fastened.
- Check power cables and electric lines for looseness, entanglement, hardening or break each day after operating for 8-10 hours. Check the presence or damage of wiring terminal cover.
- In case of slack or entangled power cables wire clips, and repair or replace broken wires. d ted wires.

2.2.14.4 Fire caused by hydraulic lines

1.

- Check the clips, guards and gaskets of all hoses and pipes to see whether they are tightened in position.
- In case of loosening, their vibration in operfederico 2022-09-06 ation may lead to friction against other components, resulting damage of hose, ejection ous injury. of high-pressure oil, disastrous fire or seri-

2.2.14.5 Fire caused by illumination equipment

- Anti-blast illumination equipment shall be used to avoid explosion when checking fuel, oil, electrolyte, window cleaning detergent or cooling fluid.
- Instructions in this manual must be followed jederico 2022-09-06 when power outlet on the machine is used for illumination.

2.2.14.6 Fire caused by heat shield

 Damage or missing of heat shield may lead to f re.









of tederico 2022-09-06 • In case of any abnormality, heat shield must be repaired or replaced prior to operation of machine.

2.2.15 In the event of fire

When a fire breaks out, leave the machine immediately by the following steps.

- Turn the start switch to the OFF position and shut down the engine.
- Leave the machine with the help of handsederico 2022-09-06 holds and step.

2.2.16 Windshield cleaning detergent

Use alcohol based detergent. Do not use methanol based detergent as it irritates eyes.

2.2.17 Ejecting parts

The grease in track tensioner is under high pressure. Improper handling may result in serious injury, blindness or death. Observe the following instructions.

- Do not disassemble grease nozzle or valve components. These parts may eject. Keep your body and face away from the valve.
- Travel reducer is under pressure.
- Gear oil is hot liquid. Wait for it to cool down before loosening the vent plug to release pressure. Keep your body and face away from the plug to avoid injury.

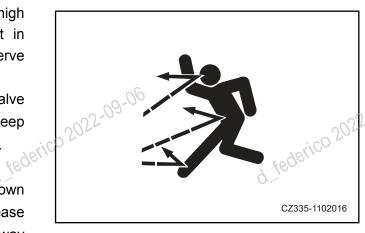


Fig.2-42

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2.2.18 Falling object protection

- When the machine is operating in places where the cab is likely to be hit or invaded by falling objects, scattered materials and foreign bodies, protective covers shall be used to protect the operator.
 - In demolishing or breaking operation, a front guard is necessary. In addition, a transparent glass film shall be applied onto the front window.
- In a coal mine or a quarry where falling obtection structures (FOPS) and front guard, and apply a transport front window. The operator shall wear a hard hat and goggles.
 - · Keep the front window shut in such conditions and make sure other people are kept a safe distance away from the operating area.
 - Other guards may be necessary according federico 2022-09-06 to different working conditions. In this case, contact your Sany dealer in advance.

2.2.19 Attachment installation

- Installation of optional parts or attachments may involve safety issues or be limited by the law. In this case, please contact your Sany dealer in advance.
- · Sany has no responsibility for the use of unauthorized attachments and parts, hence the injury, accidents and product failure.
- un 2022-09-06 Before installing and using machine attachments, read related instructions regarding attachment in this manual. the attachment and general precautions on

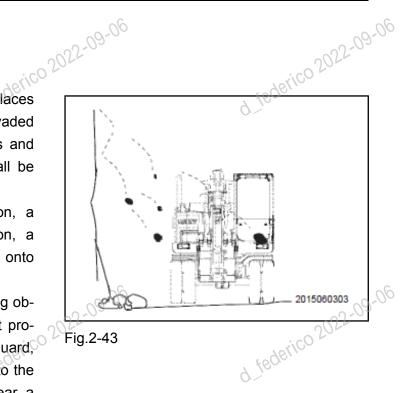


Fig.2-43



Different or combined work equipment may collide with the cab or interfere with other chine components. equipment you are not familiar with, check the clearance between it and the machine and operate carefully.

2.2.21 Cab windows glasses

- operator in disconnect with the work equipment. In this case, stop operation immediately and replace the glasses.

 Broken or dama Broken cab windows at the side of the work place the glasses.
- Broken or damaged window provides no protection to the operator. When the roof window is damaged, replace it immediately with a new one.

2.2.22 Unauthorized modification

Any modification unauthorized by Sany may lead to safety problems, personal injury or death. Improper modification can affect machine's strength and operator's view. Please contact your Sany dealer before making any modification. Sany assumes no responsibility for any accidents, failure or damage caused by unauthorized modification.

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2.2.23 Worksite investigation

- Machine operation near flammable materials (e.g. dry tree leaves) poses a fire hazard. Be careful during operation.
 - Check the terrain and ground condition and use the safest operating method. Do not operate in areas with the risk of landslide or falling stones.
 - Solidify the ground when operating beside a ditch or on road shoulders. Keep machine a safe distance away from the ditch or road shoulder. Assign a signal man, when necessary, to avoid accidental injury.
- When underground water mains, gas lines, cables or high-voltage electric wires are available on the work site, inform related utilities providers and mark the area. Be careful not to cut or damage any lines.
 - Prevent any unauthorized personnel from entering the work site. Assign a signal man and fence the work site when operating on a highway.
 - Be especially alert when operating on frozen ground. Increase of ambient temperature may result in soft and slippery ground.
 - When traveling or operating in shallow water or soft ground, check the type and condition of rock bed as well as the depth and water flow prior to operation.

2.2.24 Operation on loosen ground

 Avoid traveling or operating the machine near cliffs, road shoulders or trenches. The chine to sink or tumble down. The ground may become even softer after her an explosion an explosion or an earthquake.

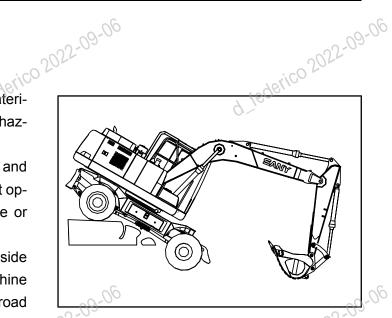


Fig.2-44

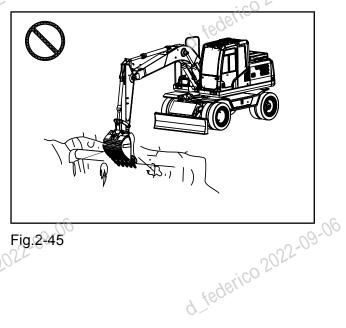


Fig.2-45



When operating on a dam or near an excavated ditch, vibration and machine weight may trigger a landslide. Prior to operation, take protective measures to prevent machine from tumbling down or falling over.

2.2.25 Overhead power cables

Do not travel or operate your machine near power cables, which may bring electrocution hazard and cause machine damage, personal injury or death. The following steps are to be followed while working at where power cables could be nearby.

- Prior to operation in the vicinity of power ca bles, inform local power company of the coming operation and ask them to take necessary measures.
- If the machine is too close to power cable, electric shock is most likely to occur and cause burns or death. A safe distance must be kept between machine and the cable (See the right table). Prior to operation, communicate with local power company regarding safety measures.
- A signalman is to be assigned to send signals if the machine is too close to the cable.
- Nobody is allowed to approach the machine when operating near high-voltage cables.
- If the machine is too close to the cable or touches the cable, to prevent electric shock, operator shall not leave the cab until power is surely cut off. In addition, nobody is allowed to approach the machine.
- To prevent accidents, wear rubber shoes and rubber gloves during operation. Cover the operator's seat with rubber sheet and pay attention to exposed part of body that should not touch the lower part of the machine.

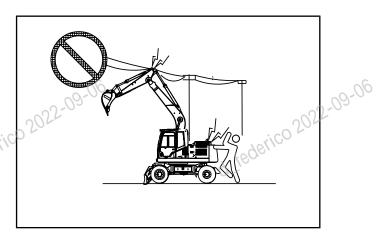


Fig.2-46

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| Cable Voltage | Safe Distance |
|---------------|------------------------------|
| 100V-200V | 2 m (7 ft) |
| 6,600V | 2 m (7 ft) |
| 22,000V | 3 m (10 ft) 4 m (14 ft) |
| 66,000V | 4 m (14 ft) |
| 154,000V | 5 m (17 ft) |
| 187,000V | 6 m (20 ft) |
| 275,000V | 7 m (23 ft) |
| 500,000V | 12 m (36 ft) |



The machine is equipped with rearview mirrors to improve the visibility of the one the decided the decided the decided to the decided the decided the decided the decided to the decided the decided the decided to the decided the decided to the dec the driver's seat.

When driving or operating the machine in places with poor visibility, uncertainty of worksite condition may cause machine damage and personal injury. Observe the following instructions when operating or driving the machine in a place without a clear view.

- Remove debris and adjust the view to ensure good visibility.

 Working in Check rear view mirrors on each workday.
- Working in a darkened area requires turning on work lights and headlights of the machine. Set up auxiliary illumination in the worksite if necessary.
- If a clear view cannot be guaranteed in days with fog, snow, rain or sand storm for example, stop operation.
- Road shoulder or soft ground should be shall especially pay attention to the marks and follow the instruction of the signal.

 • Prior to operation
 - ers understand the signals and gestures.

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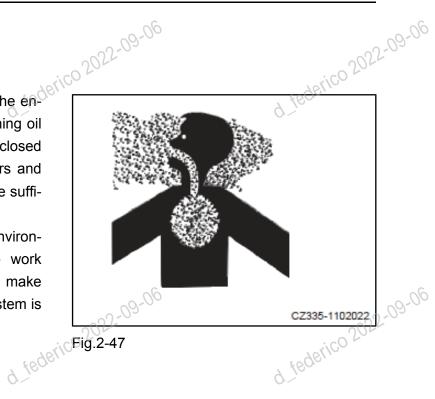
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2.2.27 Ventilation

- Engine exhaust gas can be fatal. If the engine must be started, or if fuel, cleaning or paint must be area, to prevent gas poisoning, doors and windows shall be kept open to ensure sufficient ventilation.
- Prevent working from poisonous environments or underground, if have to work under these environments, please make sure mask is wore and ventilation system is d federico 2022.



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2.2.28 Asbestos

Inhalation of asbestos dust can cause lung cancer. There is the danger of inhaling asbestos dust when engaging in tear-down operation or handling of industrial wastes at worksite. The following rules must be followed.

- Water, instead of compressed air, shall be used to clean the dust.
- If the air contains asbestos dust, operate the machine following the wind. All persons shall wear acceptable filter mask.
- Nobody is allowed to approach the machine during operation.
- The regulations, rules and environment criterion at worksite shall be observed.

WARNING

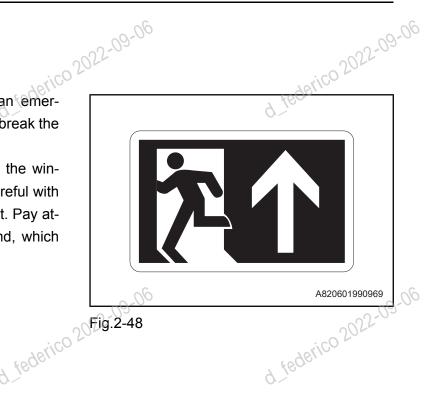
d. federico 2022-09-06 No asbestos is used in this machine. But aftermarket parts could contain asbestos. Therefore, use only the parts and components supplied by Sany.





2.2.29 Alternate exit

- If the cab door fails to open in an emergency, use the escape hammer to break the window.
 - · Remove the pieces of glass from the window frame before escaping. Be careful with the broken glass to avoid being cut. Pay attention to the debris on the ground, which may cause you to slip and fall.



d federico 2022-09-06 2.3 safe machine operation

2.3.1 safe operation precautions

2.3.1.1 Safe get in and out of the machine

When you mount or dismount the machine:

- Always face the machine and maintain a three-point contact (one hand and two feet or two hands and one foot).
- Never jump on/off the machine. Do not mount a moving machine.
 - Do not use any control lever as hand-hold.
 - Remove the mud, oil dirt and water from pedal, handholds and your soles at any time.
 - The cab must be aligned with the undercarriage center-line before you enter or exit the cab.



Fig.2-49

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• Uncomfortable seat position can easily lead to operator fatigue and operating mist.

The seat position of change of operator.



derico 2022-09-06 2.3.1.3 Seat belt

The operator may get seriously injured or killed when the machine tips over. Before operating the machine, examine your seat belt, the buckles and the anchor point. Replace the seat belt if damage or excessive wear is observed. When the machine is operating, keep your seat belt buckled up.

The seat belt shall be replaced every three years regardless of its condition.

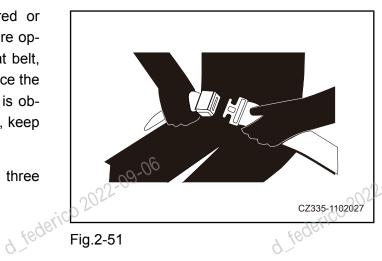


Fig.2-51

2.3.1.4 Before starting the engine

Before starting your daily work, the following items shall be observed prior to start of the engine.

- · Clean the front window and the mirrors to ensure good visibility.
- Clean the work lamps, and check if they work.
- Check coolant level, fuel level and engine oil level.
- Check for blocked air filter.
- Check for damaged electrical wires.

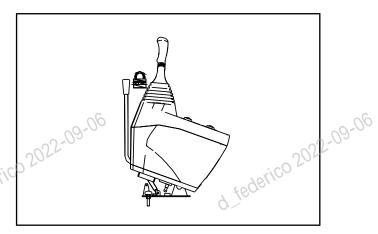


Fig.2-52

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- tion; check seat belt and buckles for damage and wear. • Adjust the seat to a position easy for operaage and wear.
 - Check if the hydraulic lockout control lever is in the LOCKED position.
 - Check if the control levers are all in neutral position. Check if the hydraulic lockout control lever is in the LOCKED position.
 - Adjust the rear view mirrors so as to see clearly from the driver's seat what is happening behind the machine.

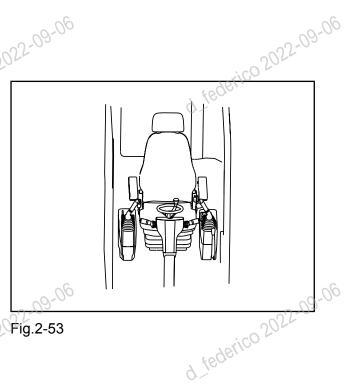
Please refer to the machine starting charter for correct turning on the machine

• Make 5

- · Make sure nobody is present in the surrounding area of the machine, horn before you turn on the machine
- · Sit on operator 's seat, adjust the seat to the comfortable position to operate all devices.
- Make sure you are familiar with all the warning devices, gauges and operation controls.
- Place all controls to idling/ or OFF position.
- Nobody else is allowed to present on Fig.2-53 machine.
 - Strictly follow the instructions of this manual to start the engine, do not short cut the turning-on circuit to start the engine.

WARNING

- Ample ventilation must be provided if you have to start the engine or operate the machine in a confined space, Excessive inha-
- If you do not know how to stop the machine do not turn it on





2.3.1.6 Starting engine in cold season

- ico 2022-09-06 Jerico 2022-09-06 Sufficient warm-up operation is necessary. Incomplete warming up may result in slow reaction and accidents.
- Before starting, check the battery electrolyte. In case of frozen electrolyte, do not charge the battery or use alternative power source to start the engine; instead, melt the electrolyte first. Otherwise, fire may break out on the battery.

2.3.1.7 Necessary Auxiliary Equipment For Machine Start-up

Improper handling may cause battery explosion or loss of machine control, resulting in personal injury and death. Never use jumper cables to start the engine unless necessary. Contact your Sany dealer before such an attempt.

- Using jumper cables to start the engine needs two persons working together with one seated in the operator seat and the other handling the battery.
- Wear goggles and rubber gloves before starting the engine with jumper cables.
- When connecting a normal machine with a faulty machine with jumper cables, battery voltage of the two machines shall be the same. Be careful not to allow the two machines to contact with each other.
- Turn both start switches to the OFF position when connecting the two machines. Otherwise, the machines may move and cause danger when power is on.
- Start with the positive terminal when connecting the jumper cable. Start with the ground or negative terminal when disconnecting the jumper cables.
- When disconnecting the jumper cable, take care not to allow the clips of jumper cable to contact with each other or with the machine.
- Control program will preheat the machine automatic, do not proceed preheating by acting to inlet system, or it will damage the engine.

2.3.1.8 After starting the engine

Run the engine at low idle for 3 to 5 minutes after engine startup, and check the running parameters and make sure they are normal and all readings are within normal working range

2.3.2 Operation

2.3.2.1 Inspection before operation

- and operate slowly. Any other person is not allowed to approach the machine.

 Be sure to faster. When conducting inspection, move the maallowed to approach the machine.
- Be sure to fasten the seat belt.





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- for abnormality; check the bucket, arm, boom, travel system, swivel such • Check the gauges and machine operation boom, travel system, swivel system and steering system for abnormal operation.
 - · Check for abnormal noise, vibration, heating, odor or gauge reading; check oil or fuel for leakage.
 - When the travel control levers are in neutral position, test the engine's speed control device; operate each control lever and confi rm they work properly. Understand the con-
 - and take corrective measures immediately. In case of any abnormality, stop operation

 Observe the machine and listen carefully for abnormal noise. In case of fault or abnormality, shut down the machine immediately. Do not operate the machine until corrective measures are taken.

2.3.2.2 Prior-operation precautions

To prevent serious injury or death, follow the items below before moving the machine.

- Working range of the machine is 12 m to the slewing center. It is dangerous to stay in the working range during machine operation.
 - Nobody is allowed to stay on or near the machine, or within the swivel range.
 - · To improve the visibility in the travel direction, you may turn the cab if necessary.
- d federico 2022-09-06 Assign a signalman where visibility is poor.

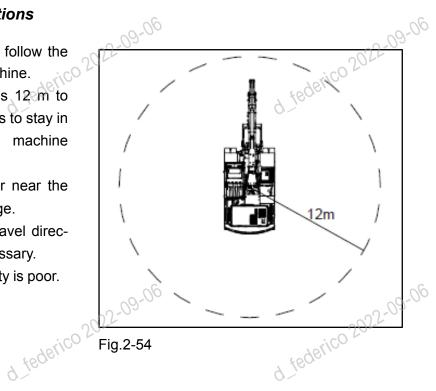


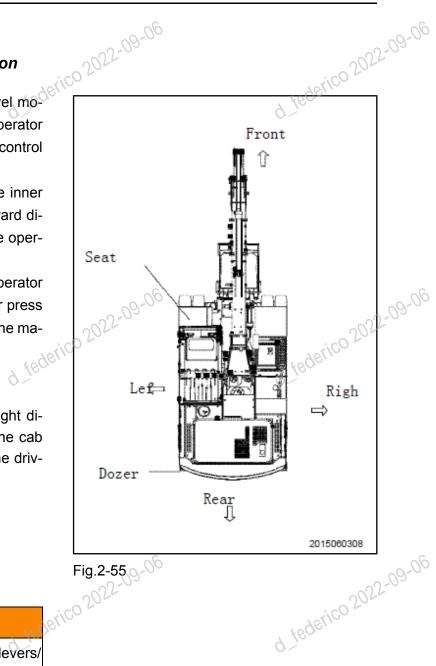
Fig.2-54

2.3.2.3 Travel direction confirmation

- Always check the position of the travel motor and the idler in relation to the one cab before you one levers or pedals.
- A direction mark is attached onto the inner side of track frame. It shows the forward direction when the idlers are before the operator cab.
- When the idlers are before the operator cab, push the travel control levers (or press the upper part of the pedal) to move the machine forward.

NOTE:

In this manual, the front, rear, left or right directions are the directions seen from the cab when the cab is straight forward and the driving wheels are in the rear.



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WARNING

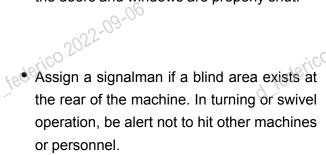
 Improper operation of travel control levers/ pedals can cause serious injury or death.

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2.3.2.4 Safety rules for turning

- Always drive and operate the machine in a seated position.
 - Nobody is allowed in the cab except the operator.
 - Check if the travel alarm works.
 - · Always secure the cab door or windows, either open or closed. At worksite where flying objects may get into the cab, check if the doors and windows are properly shut.



 Check for the presence of personnel and/ or obstacles again in the machine surroundings before traveling.

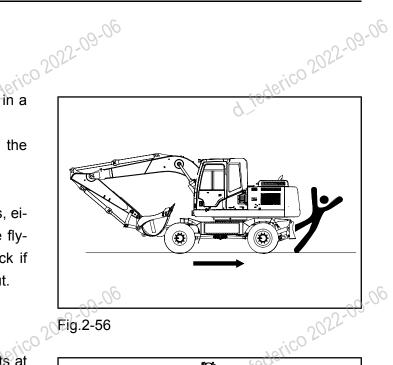


Fig.2-56

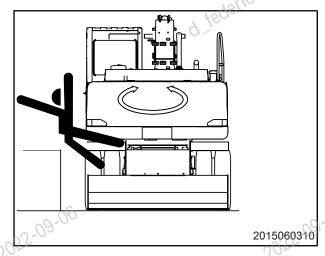
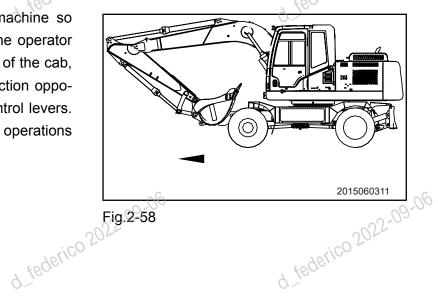


Fig.2-57

d federico 2022-09-06 Before traveling, position the machine so that the sprockets are behind the operator cab. If the sprockets are in front of the cab, the machine will move in a direction opposite to the move direction of control levers. Special attention must be paid to operations under such circumstances.



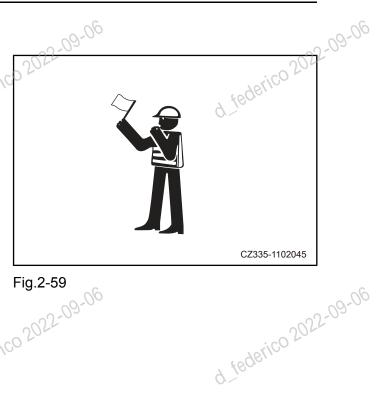
- If your vision is limited during reverse travel, assign a signalman and keep him within the range of your vision.
- When a signalman is necessary on some occasions, use hand signals specified in local regulations.
- The machine can only be moved when both the signalman and the operator understand the signals.
- Understand all vocal, graphic and flag sigfederico 2022-09-06 nals used in work and decide who is to give signals.
- Keep the windows, rear view mirrors and work lights clean and intact.
- Dust, heavy rain and fog may reduce visibility. Drive slowly and use proper lights in case of low visibility.

WARNING

 During reverse or swivel operation, people around the machine may get hit by the counterweight or work equipment, resulting in serious injury or even death.

2.3.2.5 Safety rules for traveling

- To prevent machine breakdown and avoid damage of work equipment, do not operate the machine beyond its maximum load or rated capacity.
- When driving or operating the machine, keep the machine a safe distance away from people, building or other machine so as to avoid collision.
- When traveling on a road, contact related departments in advance and follow their instructions.
- When traveling on flat ground, the work equipment should be retracted and kept 20-30cm (8-12in) off the ground.



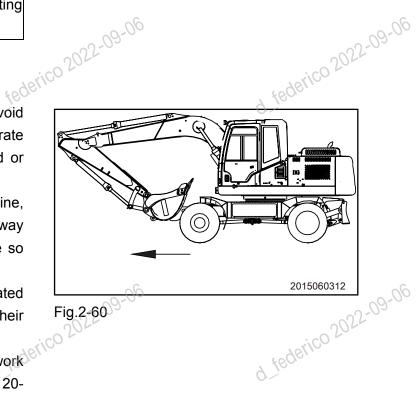


Fig.2-60



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- equipment should be retracted and kept off the ground. WWhen traveling on flat ground, the work the ground.
 - When traveling on rough ground or on a steep slope, the auto-deceleration switch (if equipped) shall be switched off. If autoidle is activated, engine speed and travel speed may drop suddenly.
 - Avoid traveling over a barrier if possible. If you have to do that, lower the work equipment close to the ground and drive slowly. Never let the machine travel on a barrier that would make it tilt sharply.
- Check first the structural strength of bridge or a building before driving the machine on it.
 - Operate slowly when working in a tunnel, under a bridge or power cables. Take care not to damage anything with equipment.

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Fig.2-61

2.3.2.6 Safe traveling

- Check the travel direction of the machine before driving it. Make sure you know how to operate the control levers and pedals.
- Work equipment should be kept 20-30cm (8-12 in) off the ground when moving on a slope. In case of an emergency, the work equipment could be lowered to ground immediately to help stop the machine.
 - When driving the machine up a slope, face the cab to the uphill direction; when driving down a slope, face the cab to the downhill direction.

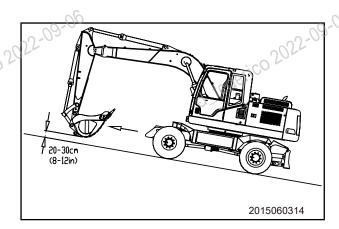


Fig.2-62

Driving the machine on a slope may cause it to slip or tumble down, resulting in a sinjury or death to slip or tumble down, resulting in serious



- Observe the hardness level of the ground before traveling.
- Before traveling, always check the hardness of ground before your machine.
- Speed down the engine and travel in a low speed while traveling down the slope.

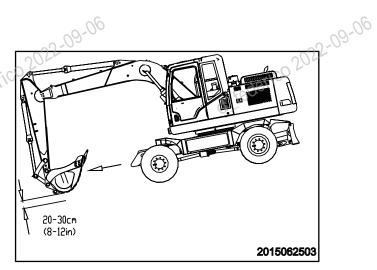


Fig.2-63

WARNING

Do not let machine move by its inertia, while doing down the slope, it may damage the travel motor

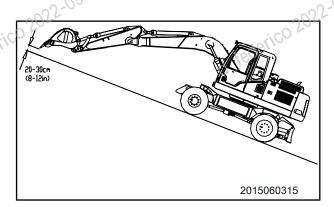


Fig.2-64

 Drive straight up and down a steep slope. It is very dangerous to turn on or drive across a slope.

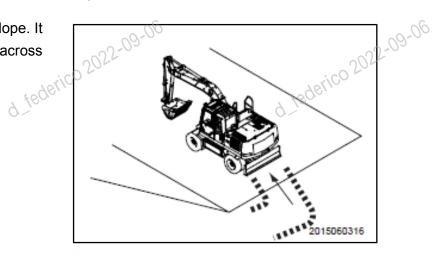


Fig.2-65

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- To adjust the position of the machine on a slope, drive it onto a flat surface, reposition it and driving the machine to the slope again.
 - Drive at low speed on meadow, fallen leaves or wet steel plate because even a small grade could cause the machine to slip.

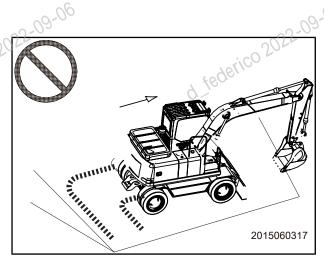
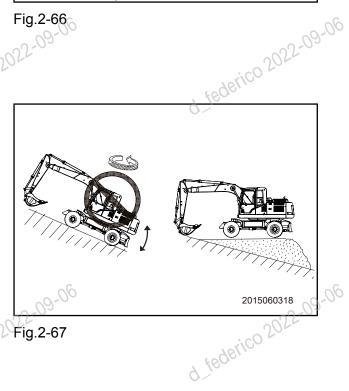


Fig.2-66

2.3.2.7 Machine operation on slope

Swinging the upper structure or operating the work equipment on a slope may cause the machine to lose balance and tumble down, resulting in serious injury or machine damage.

- When the bucket is fully-loaded, do not turn the work equipment from the higher part to the lower part of the slope, which is dangerous and may cause the machine to tumble down.
- If you have to operate your machine on a keep the machine as horizontal as possible. slope, build an earth platform that could



7 Fig.2-67

2.3.2.8 Operation in snowy weather

- · Snow-covered or frozen surfaces are slippery. Do not manipulate the control lever suddenly when driving or operating the machine. Extra attention should be paid to operation on a slope because even small inclination could cause the machine to slip.
- ico 2022-09-06 The machine may tip over on frozen surface which may become soft upon increase of ambient temperature.
- Avoid deep snow, which may cause your machine to tip over or to be buried in snow. Be noted that you shall never be away from



• When cleaning the snow, it is hard to see the snow-covered road shoulder and jects near the road. machine to tip over or hit the covered objects. Therefore, please operate with extreme caution.

2.3.2.9 Restricted operation

 Never dig under an overhang, which may lead to falling stones, collapse of overhang, d tederico and accidents.

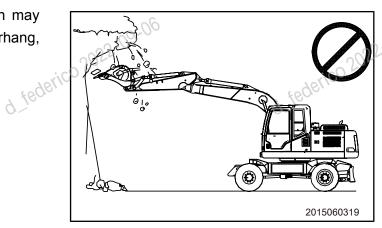


Fig.2-68

• Never dig too much under the machine, which may cause the ground to collapse due to cave-in, hence the accidents. d federico

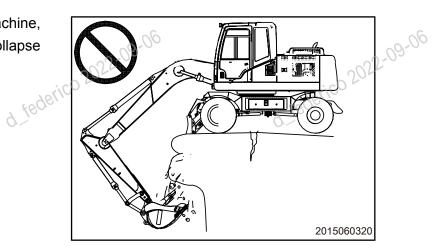


Fig.2-69

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- Never tear down under your machine, which may cause your machine to lose balance and roll over.
 - · When operating on building or other structures, strength of structure must be checked to avoid collapse of building, thus resulting injury or death.

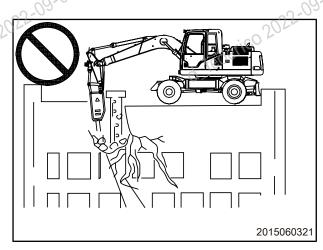
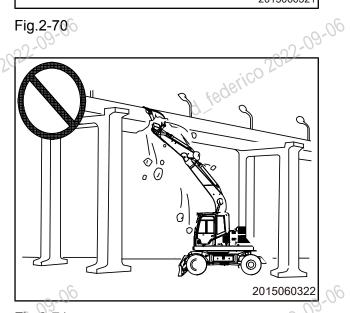


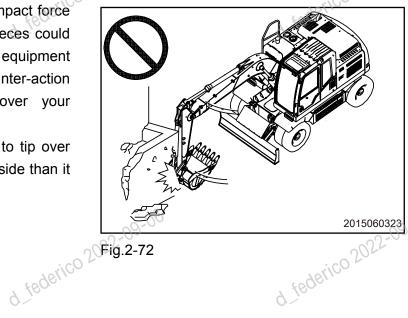
Fig.2-70

 Never tear down any structure over your machine. The falling of broken objects or collapse of building could damage your machine and cause personal injury or death.



- Fig.2-71

 Never break anything with the impact force of work equipment as broken pieces could lead to personal injury, the work equipment could be damaged, and the counter-action of impact force could roll over your machine.
- · Generally speaking, it is easier to tip over with the work equipment at one side than it is positioned in the front or rear. d.federico 2022-09-06



- Lifting, moving or swinging the bucket shall never pass over anybody or a truck's cab. The falling of substances from the bucket or collision of buckets could result in personal injury or machine damage.
- Do not lift any objects or transport people, it may be fatal.
- The use of crusher or other heavy working unit could cause your machine to lose balance and tip over. When operating on a flat

Never extend or retract the boom cylinder suddenly as which may cause vous chine to tip over different suddenly as which may cause vous suddenly as which may cause your ma-

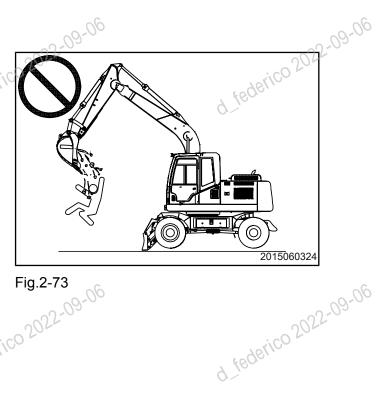


Fig.2-73

2.3.3 Parking the machine

2.3.3.1 Select a parking place

- Park your machine on a solid and flat surface.
- Park the machine in an area free of such hazards as falling stones or landslide. If the terrain is low, park it in a relatively higher place.
- Park the machine on a flat ground, if you have to park the machine on a slope, observe the following instructions:
 - Position the bucket in the downhill direction and cut the bucket tips into the earth.
 - Put the objects under the tyres to prevent unexpected movement.
- Do not park your machine on a road undergoing construction. If you have to park your machine in such a place, flags are to be used on daytime and signal lamps at night

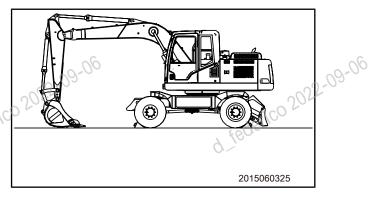


Fig.2-74

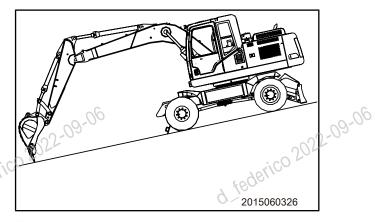


Fig.2-75



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d_federico 2022-09-06 to warn other people or vehicles according to local regulations.

2.3.3.2 Machine shutdown

Follow the procedures below to shut down the machine. For detailed information, please refer to the related chapters:

- Stop the machine.
- Position the machine properly.
- · Lower the work equipment to the ground or place it in a fixed position.
- Slow down the engine and keep it running at low idle for 5 minutes.
- Turn the start switch to OFF position to stop the engine.
- Move the lockout lever to the LOCKED position.
- Remove the key.
- Close the windows and the cab door.
- Lock all access doors. boxes and chambers.

NOTE:

When leaving your machine, face the machine and maintain a three-point contact with it. Do not jump off the machine.

Be careful with slippery track, step and handholds when dismounting the machine.

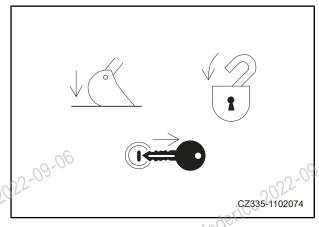


Fig.2-76

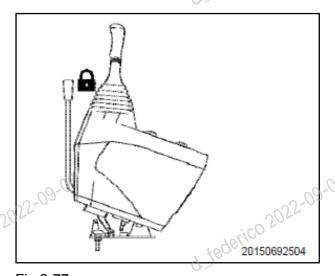


Fig.2-77

2.3.4 Transportation

2.3.4.1 transportation of machine

During transportation of machine, be aware of the following instructions:

- learn about overall length, width and height of transportation vehicles to avoid overhead obstacles and narrow passage obstacles.
- when passing bridges, inspect the load limit of the bridge; when travelling on highway,



d federico 2022-09-06 follow transportation regulations and follow direction policemen guidance.

2.3.4.2 Loading and unloading

Improper loading and unloading of the machine may cause it to fall or tip over. Follow the procedures below: :

- Load or unload the machine only on a solid and flat surface. Keep it a safe distance away from road sides or a cliff.
- Use an access ramp with enough strength. Make sure that the width, length and thickness of the access ramp is capable of providing a safe loading/unloading operation (at an angle ≤15°).
- Make sure the access ramp is free from grease, oil, water and debris. Clean the track if necessary. Be extremely careful when loading or unloading the machine in rainy or snowy weather.
- Never load or unload the machine using the force of work equipment, which may cause the machine to fall or tip over.
- Run the engine at low speed and drive slowly.
- Do not operate any control levers other than the travel control lever when the machine is driving up the ramp.
- Do not reposition the machine on the access ramp. If necessary, drive it off the ramp, reposition, and get on the ramp again.
- When loading or unloading the machine on a platform, make sure the platform has adequate width, strength and a proper grade.
- d. federico 2022-09-06 The trailer may become less stable with the machine on it. Retract the work equipment and swing the upper structure slowly.

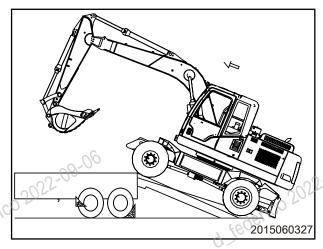


Fig.2-78

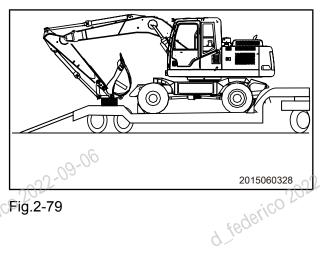


Fig.2-79



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- Once the machine is loaded, lock the cab door. Otherwise, it may swing open during transportation.
 Secure the machine ...
 - Secure the machine with chains and chocks.

2.3.4.3 Battery

Preventing hurting from battery

Battery contains sulfur acid, it generates flammable, explosive hydrogen, wrong operation might lead injury or fire damage, do please follow the instructions below:

- Do not smoke or use fire near a battery.
- Before check or handle the battery, make sure ignition key is in OFF position.
 - Wear safety glasses and rubber gloves when handling battery.
 - Electrolyte may cause blindness. Flush immediately with plenty of clean water when electrolyte gets into your eyes and seek medical attention.

follow instructions below to avoid explosion of battery

- Never allow tools and other metal parts to contact with battery terminals. Keep tools or metal parts away from batteries.
 - Stop the engine and wait for one minute before you proceed. Always disconnect the grounding terminal (negative (-)) first. To connect battery cables, always begin with the positive (+) terminal, and then connect the negative (-) terminal. Ensure all terminals are securely connected.
 - Battery temperature rises when it is being charged. When battery temperature exceeds 45°C, stop charging and wait till it is at ambient temperature. Reduce the charging current by half and continue the charging process.



Fig.2-80

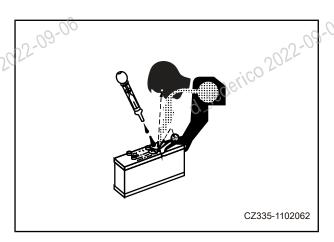


Fig.2-81



- move it from the undercarriage, put it in well-ventilated area and remove the confidence of the squirts out. · A battery being charged may give off flam-
- If acid squirts out of battery vent during charging, stop charging immediately.
- · Never smoke and keep flames or sparks out when charging.
- · When the battery has been fully charged, a green indicator will be on. Stop the charging d. federico 2022-09-06 process at this time.
- Restore the battery cover after charging.
- d.federico Put the battery back to its original position.

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- 2.3.4.4 Lifting objects with the machine
 Nobody is allowed 4-Nobody is allowed to enter the working area.
 - · Confirm all signals to be used and assign a signalman prior to operation.
 - Lift a load on a flat surface to prevent the machine from tilting or tipping over.
 - Observe the loading capacity before lifting, do not exceed the loading capacity.
 - Never use chains, wire ropes, shackles and slings that are damaged.
 - Anchor wire ropes or slings onto the designated lifting lug. Never attach the shackle or sling onto the bucket tips. Loosened bucket tips could cause the load to fall.
 - Never leave the operator seat when lifting is in progress.
 - To prevent the load from hitting any person or building, inspect carefully the machine surroundings before swinging or operating the work equipment.
- Never swing or operate the work equipment suddenly. This may cause the load to drift and the machine to tip over. Use a drag rope if necessary.
 - Never use the work equipment or the swing force to drag the load in any direction. The work equipment will jerk if the shackle breaks and the load comes free, resulting in serious personal injury.

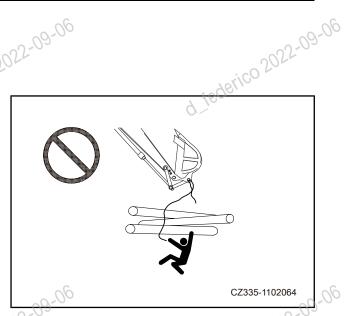


Fig.2-82

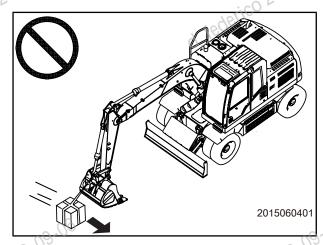
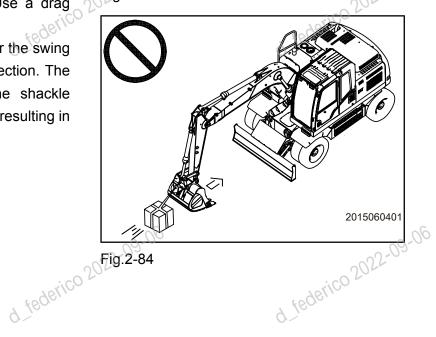


Fig.2-83



When towing a damaged machine, improper operation or use of unacceptable wire could lead to serious

- Do not tow the machine on a slope.
- Wear protective gloves and a hard hat when using wire ropes.
- Check the strength of wire cable and make sure it could bear the weight of machine.
- Do not use ropes with broken wires (A), reduced diameter (B) and twisting (C). Such ropes may break when towing.
- Do not stand between the towing machine and the towed machine during towing operation.
- Operate the machine slowly. Do not add load to the wire cable suddenly.

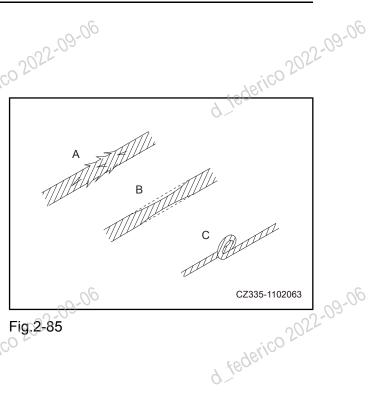


Fig.2-85

2.4 Precautions for Maintenance

2.4.1 Prior-maintenance precautions

- Understand maintenance procedure prior to operation
 Keep a clean and dry working area
- Do not spray water or steam in the cab
- d_federico 2022-09-06 Never add lubricant and carry out other maintenance work when your machine is moving
- Keep your hands, feet and clothing away from rotating parts





2.4.2 Get prepared

Only approved personnel can maintain or repair the machine. An observer may be assigned if necessary

- Wear protective clothing and shoes necessary for the job
- Wear a face shield when removing spring or elastic parts, or adding acid to battery. Wear safety hat and goggles when you weld or cut with a torch
- When compressed air is used for cleaning, flying particles may cause personal injury. In this case, wear goggles, dust-preventive mask, gloves and other protective gear
 - When using a hammer to strike hard metal parts such as pin, bucket teeth, cutting edge or shaft, the flying of parts and metal pieces may cause bodily injury. Therefore, wear goggles and gloves and ensure the surrounding area is clear of any other people
 - Do not carry out grinding, flame cutting or welding without an aspirator and ventilation equipment. If necessary, follow the instructions of proper operation
- Loud noise may impair your hearing permanent or temporary. When maintaining the engine, wear ear covers or ear plugs if you have to work in loud noise for a long time
 - Wear rubber apron and rubber gloves when handling corrosive materials. Wear heavy gloves when handling wooden materials, wire ropes or sharp-edged metals

• For maintenance work, select a clean flat area with plenty of space. ample and good and good ventilation



Fig.2-86

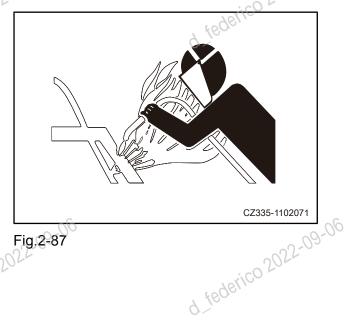


Fig.2-87



- · Clean the working area by removing fuel, lubricant and water, and covering slippery ground with sand or other absorptive materials
- Do not leave your hammer or other tools at the working area
- If a clean, tidy working area cannot be guaranteed, there would be danger of tipping, thus resulting in personal injury



2.4.4 Procedures of shutting down engines Before maintenance

Before maintenance:

- Park the machine on a solid flat ground.
- Put the bucket on the ground
- Stuck machine with objects under tires, preventing machine from moving
- Turn the fuel control dial to first gear. Run the engine at low speed for 5 minutes
- Turn the start switch to OFF position and stop the engine
- Turn the start switch to ON position. Operate the control levers 2 or 3 times in all directions to relieve internal pressure of the hydraulic system
- Place the hydraulic lockout control to the LOCKED position

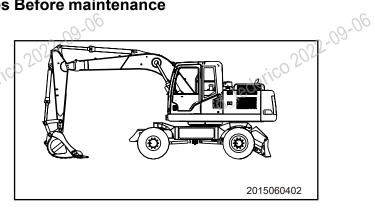


Fig.2-88

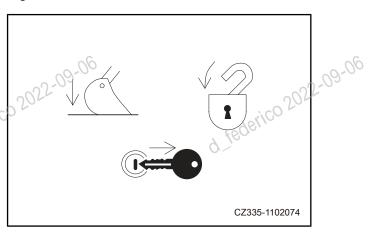


Fig.2-89



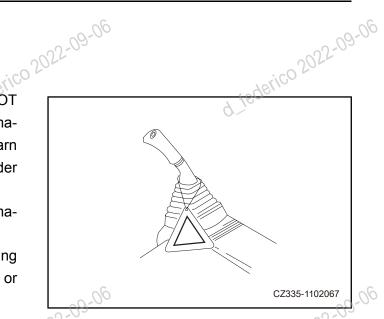


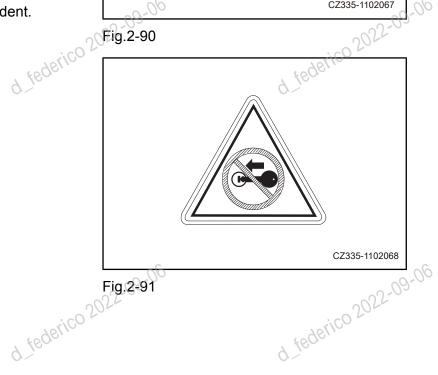
2.4.5 Lockout and tag-out measures

• Prior to maintenance, attach a DO NOT OPERATE tag or similar sign to the machine's start switch or control levers to warn that this machine others is under maintenance.

> Attach other warning tags around the machine if necessary.

 When maintenance is underway, starting the engine or moving the control levers or pedals could lead to serious accident. d federico 2022





irico 2022-09-06 2.4.6 Use proper tools

 Use proper tools and use them correctly. Using damaged, inferior, defective, temporary tools or using the tools incorrectly could lead to serious accidents.

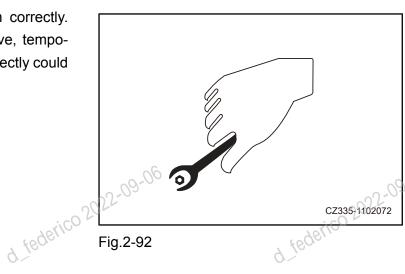


Fig.2-92



To prevent injury, no maintenance shall be carried out when the engine is running ever, if maintenance be ning engine, at least two workers are needed to carry out the maintenance:

- · One of the workers shall stay in the operator seat ready to shut down the engine at any time. All the workers involved shall keep in touch.
- Place the hydraulic lockout control lever to the LOCKED position to prevent movement of work equipment. d jeder

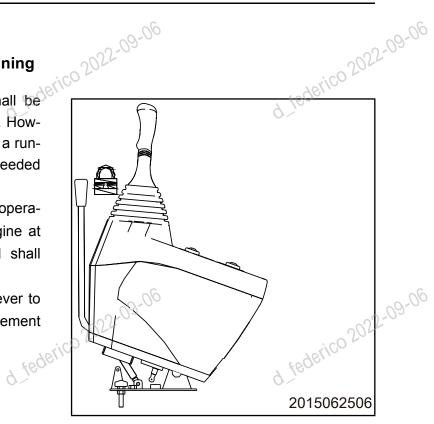


Fig.2-93

- Pay high attention to rotating parts like fan and fan belt.
- · Do not leave or insert any tool or other objects in the fan or the fan belt, which may cause the parts to break or fly.
- Do not touch any control lever. If one of the control levers must be used, give signal to other workers and warn them to move quickly to a safe area.



Fig.2-94

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2.4.8 Work under the machine

- Never carry out maintenance before the machine is well supported.
 - Lower the work equipment to the ground before maintaining the machine.
 - If the machine or work equipment has to be lifted for maintenance, blocks or sup-ports that are strong enough to support the machine or work equipment should be used. Never use slag bricks, empty tires or stands to support the machine. These things may collapse under continuing load. Never use single jack to support the machine.
- If the track shoes are lifted and the machine is solely supported by the work equipment, it is very dangerous to work under the machine. In case of failure of hydraulic pipe or accidental touch of control lever, the work equipment or machine may fall suddenly, causing injury or death. Never work under the machine if it is not firmly supported with arico 2022-09-06 blocks or supports.

2.4.9 Track maintenance

- Rutinely check the pressure and abrasive condition, clean the jammed rocks on tyres in time.
 - Avoid expose tyres under the sun for a long time, prevent travel on a heat road for a long time, if necessary, use the proper way to cool down the tyres.
- The standard pressure range of the tyres is d.federico 2022-09-06 at 740±20 (Kpa), keep the tyre pressure d federico 2022 at its lower range when summer.



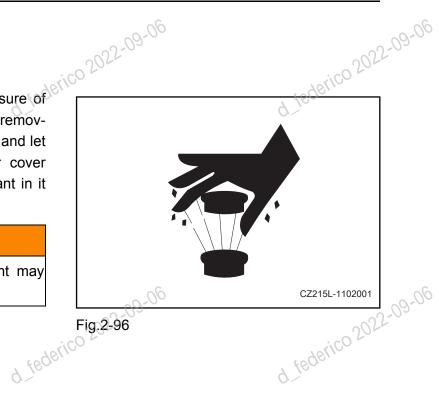
Fig.2-95



When engine temperature rises, pressure of the cooling system increases. Before receipts the radiator cover of the cooling system increases. the system cool down. The radiator cover could only be removed after the coolant in it has cooled down.

WARNING

 Touching hot high- pressure coolant may cause serious injury



federico 2022-0 2.4.11 High-pressure hoses

If oil leaks from high-pressure hose, fault or even fire may occur. If any bolt on hose is loose, stop operation and tighten it to specified torque. In case of hose damage, stop operation immediately and contact Sany HM authorized dealer.

- Damage or leak of hydraulic hose fitting.
 Damage or break of outer cover, or exposed steel wires of reinforcement lead
 Ballooning out posed steel wires of reinforcement layer.
- Impurities in outer cover.
- Distortion or crushing of movable parts.

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2.4.12 Pressurized fluid

The hydraulic system is always under pressure. Make sure pressure in hydraulic circuits has been relieved before checking or replacing the lines. Residual pressure in the circuit may cause serious accidents:

- Release system pressure before maintaining the hydraulic system:
 - 1. Release system pressure before maintaining the hydraulic system
- 2. release pressure of pilot pipes. Within 15 seconds of engine shut-off turn the key on, unlock safety lever, and operate the directions stick fully to release pressure from accumulator.

Open fire is not allowed around the hydraulic system. Remove splashed hydraulic oil as quickly as possible.

- Diesel oil or pressurized hydraulic oil can penetrate skin or eyes, causing serious injury, blindness or death. It is hard to find the leaking of hydraulic oil with naked eyes. A cardboard or wooden board is necessary for checking for leaks. Do not touch leaking liquid with bare hand. Wear face shield or safety goggles to protect your eyes. If any liquid penetrates your skin, flush with clean water immediately and get medical attention as soon as possible.
- The fuel lines are under high pressure when the engine is running. When checking or d.federico 2022-09-06 servicing the fuel system, shut down the engine and wait for 30 seconds till internal pressure drops prior to operation. d teder

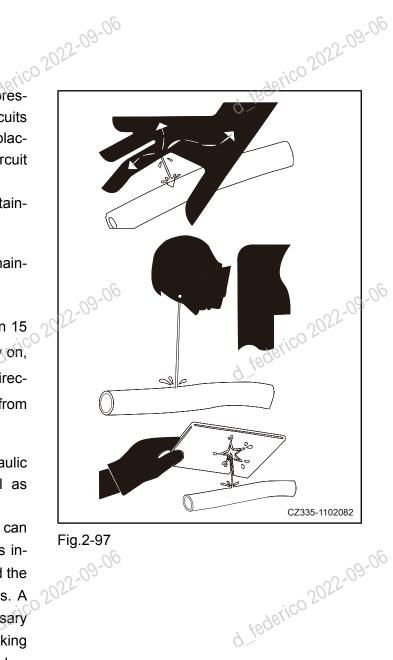


Fig.2-97 2022-09-06



Welding operation may lead to fire or electric shock. Only qualified welders are allowed conduct welding on the co equipment.

2.4.14 Maintain Air-conditioner safely

WARNING

- Refrigerant R134- a is a harmless gas • Keep fire source away when servicing air condition system.
 • In maintenance
- condition system.
- observe the instruction on the refrigerant cylinder and use it correctly. The type of refrigerant is R134a. Use of other refrigerants may damage the air-conditioning system.
- Obey local material disposal regulations. Never discharge refrigerant directly into the air.

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Fig.2-98

2.4.15 High voltage precautions

- When the engine is running or has just been shut down, high voltage can occur in fuel injector terminal and engine controller. Since there is danger of electric shock, do not touch fuel injector or interior of engine controller.
- Please contact Sany dealer if you have to access fuel injector terminal or interior of engine controller. d federico 2022-09



2.4.16 Accumulator

Accumulator contains highly pressurized nitrogen. Improper operation of accumulator can cause explosion and serious accidents. Therefore, the following precautions must be observed:

- Do not disassemble the accumulator.
- Do not let the accumulator be near a fire source or exposed in flame.
- Do not drill, weld or flame- cutting the accumulator.
- Do not punch, weld or flame- cut on accumulator.
- The gas must be released when disposing of the accumulator. Contact Sany dealer for this disposal.

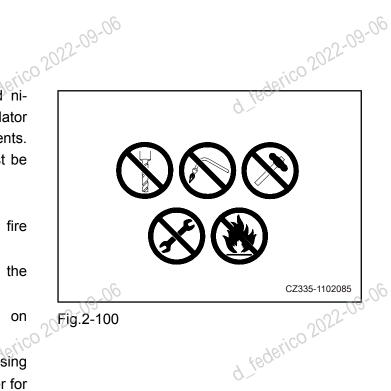


Fig.2-100

2.4.17 Fire and explosion prevention

WARNING

- Never smoke when handling the fuel or maintaining the fuel system. The gases in empty fuel tank can cause explosion easily, never carry out flame-cutting or welding operation on fuel pipe, fuel tank or fuel vessels, which can lead to fire, explosion, injury or death.
- Then engine must be shut down and electrical equipment must be switched off when refueling the tank. Be extremely careful when adding fuel to a hot engine. No sparks shall occur around the grounding nozzle.
 - Handle all solvents and dry chemicals in a place with good ventilation according to the steps indicated on vessel.
 - Clean the machine of all dust and residuals. Do not place greasy rag or other flammable materials on machine.
 - When cleaning the parts and components, use nonflammable solvents instead of gasoline, diesel oil or other flammable fluids.
 - Store flammable liquids and materials in suitable vessels as required by safety laws and regulations.
 - Check fire extinguishers, fire-fighting system and fire detectors (if equipment) and make sure d federico d federico they are ready for use.

2.4.18 Regular replacement of safety-related parts

- lerico 2022-09-06 Safety-related parts such as hoses and seat belt must be replaced regularly for the consideration of operating the machine safely in a long term.
- Materials of some parts may deteriorate naturally when exceeding specific time limit. Repeated use may lead to deterioration, wear and damage, hence the acci- dents and serious injury. Through merely visual inspection or feel it is hard to find out how long the parts could serve. Therefore, regular replacement is necessary.
- Repair or replace any safety parts once found defective regardless of its service time.

2.4.19 Maintenance operation

- Check all parts and replace the worn, broken and damaged parts during repairing operation.

 Over-worn and over-damaged parts may fell in any fell in damaged or illegible signs and marks.
- Tighten all fasteners and connectors to specified torque.
- Install all guards, covers and hoods after repair and service. Replace or repair dam- aged guards. Only the type of hydraulic oil approved or recommended by Sany should be used to make up the hydraulic system.
- Start the engine and check for any leaks (check the hydraulic system), and operate all control devices to be sure of their proper functioning. Make road test if necessary. Shut down the engine and check the work you have done (see if there are missing pins, gaskets and nuts). Check d_federico 2022-09-06 Joil Jederico 2022-09-06 again all hydraulic oil levels prior to operation.

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2.4.20 Proper disposal of wastes

Improper disposal of wastes harms the environment and ecology. Consult local environmental protection department or Sany dealers for methods of recycling and waste disposal.

- Potential harmful substances used in Sany products include hydraulic oil, fuel, cooling liquid, refrigerant, filter and batteries etc.
- Use leak-proof vessels to hold discharged fluids. Do not use food or beverage containers.
- Do not dump waste fluids directly to the ground, sewage or water source.
- Leaking of refrigerant from air conditioner can spoil the atmosphere of the globe. Related laws and regulations must be followed to recover or regenerate the refrigerant.

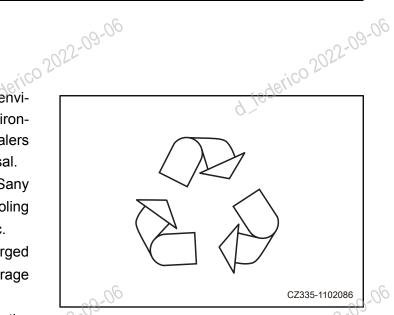


Fig.2-101



Fig.2-102

terico 2022-09-06 2.5 Precautions for Maintenance

2.5.1 Prior-maintenance precautions

To prevent accidents:

- Understand maintenance procedure prior to operation
- Keep a clean and dry working area
- Do not spray water or steam in the cab
- d_federico 2022-09-06 Never add lubricant and carry out other maintenance work when your machine is moving
- Keep your hands, feet and clothing away from rotating parts d federico 2022 d federico 202



Only approved personnel can maintain or repair the machine. An observer may be signed if necessary

- Wear protective clothing and shoes necessary for the job
- Wear a face shield when removing spring or elastic parts, or adding acid to battery. Wear safety hat and goggles when you weld or cut with a torch
- When compressed air is used for cleaning, flying particles may cause personal injury. In this case, wear goggles, dust-preventive mask, gloves and other protective gear
- When using a hammer to strike hard metal parts such as pin, bucket teeth, cutting edge or shaft, the flying of parts and metal pieces may cause bodily injury. Therefore, wear goggles and gloves and ensure the surrounding area is clear of any other people
- Do not carry out grinding, flame cutting or welding without an aspirator and ventilation equipment. If necessary, follow the instructions of proper operation
- Loud noise may impair your hearing permanent or temporary. When maintaining the engine, wear ear covers or ear plugs if you have to work in loud noise for a long time
- Wear rubber apron and rubber gloves when handling corrosive materials. Wear heavy gloves when handling wooden materials, wire ropes or sharp-edged metals

• For maintenance work, select a clean flat area with plenty of space, ample support and good year. and good ventilation



Fig.2-103

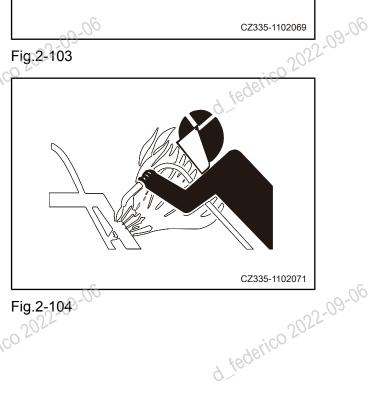


Fig.2-104



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- Clean the working area by removing fuel, lubricant and water, and covering slippery ground with sand or other absorptive materials
 - Do not leave your hammer or other tools at the working area
 - If a clean, tidy working area cannot be guaranteed, there would be danger of tipping, thus resulting in personal injury



Before maintenance:

- Park the machine on a solid flat ground.
- Put the bucket on the ground
 - Stuck machine with objects under tires, preventing machine from moving
 - Turn the fuel control dial to first gear. Run the engine at low speed for 5 minutes
 - Turn the start switch to OFF position and stop the engine
 - Turn the start switch to ON position. Operate the control levers 2 or 3 times in all directions to relieve internal pressure of the hydraulic system
 - Remove the key from the switch
- Place the hydraulic lockout control to the LOCKED position

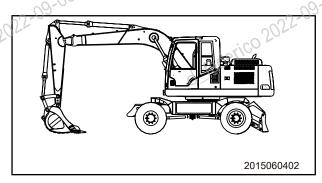


Fig.2-105

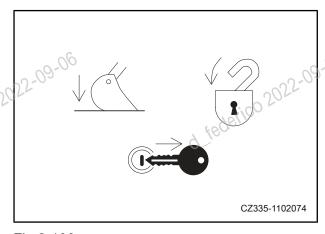


Fig.2-106





• Prior to maintenance, attach a DO NOT

OPERATE tag or similar sign to the chine's start switch others that this machine is under maintenance.

Attach other warning tags around the machine if necessary.

 When maintenance is underway, starting the engine or moving the control levers or pedals could lead to serious accident. d federico 2022

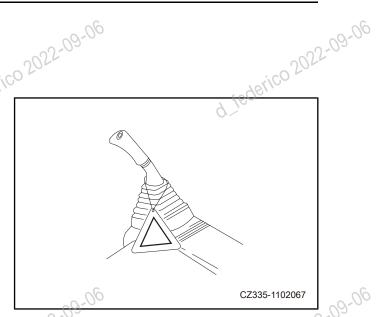


Fig.2-107

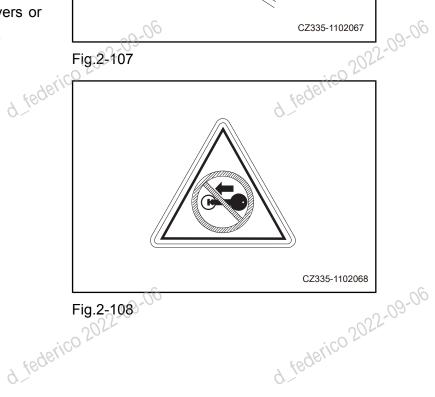


Fig.2-108 d federico 202

irico 2022-09-06 2.5.6 Use proper tools

 Use proper tools and use them correctly. Using damaged, inferior, defective, temporary tools or using the tools incorrectly could lead to serious accidents.

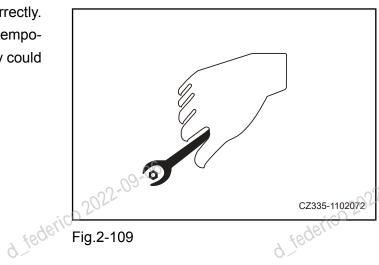


Fig.2-109

2.5.7 Maintenance with engine running

To prevent injury, no maintenance shall be carried out when the engine is running. However, if maintenance has to be done on a running engine, at least two workers are needed to carry out the maintenance:

- One of the workers shall stay in the operator seat ready to shut down the engine at any time. All the workers involved shall keep in touch.
- Place the hydraulic lockout control lever to the LOCKED position to prevent movement of work equipment.

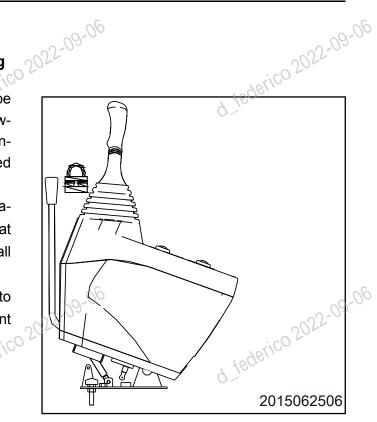


Fig.2-110

- Pay high attention to rotating parts like fan and fan belt.
- Do not leave or insert any tool or other objects in the fan or the fan belt, which may cause the parts to break or fly.
- Do not touch any control lever. If one of the control levers must be used, give signal to other workers and warn them to move quickly to a safe area.

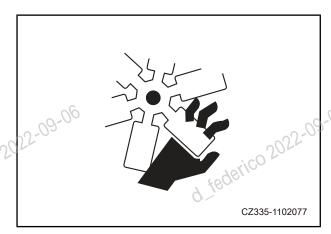


Fig.2-111



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- Never carry out maintenance before the machine is well supported.
 Lower the work
- before maintaining the machine.
- If the machine or work equipment has to be lifted for maintenance, blocks or sup-ports that are strong enough to support the machine or work equipment should be used. Never use slag bricks, empty tires or stands to support the machine. These things may collapse under continuing load. Never use single jack to support the machine.
- If the track shoes are lifted and the machine is solely supported by the work equipment, it is very dangerous to work under the machine. In case of failure of hydraulic pipe or accidental touch of control lever, the work equipment or machine may fall suddenly, causing injury or death. Never work under the machine if it is not firmly supported with blocks or supports.

- Rutinely check the pressure and abrasive condition, clean the jammed rocks on in time.
- Avoid expose tyres under the sun for a long time, prevent travel on a heat road for a long time, if necessary, use the proper way to cool down the tyres.
- The standard pressure range of the tyres is d federico 2022-09-06 at 740±20 (Kpa), keep the tyre pressure at its lower range when summer. d federico 2022



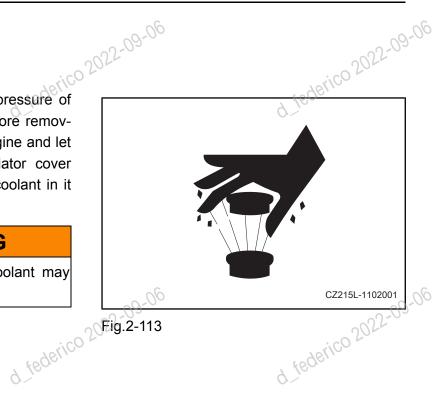
Fig.2-112



When engine temperature rises, pressure of the cooling system increases. Before rooming the radiator cover of the cooling system increases. the system cool down. The radiator cover could only be removed after the coolant in it has cooled down.

WARNING

 Touching hot high- pressure coolant may cause serious injury.



d federico 2022-05 2.5.11 High-pressure hoses

If oil leaks from high-pressure hose, fault or even fire may occur. If any bolt on hose is loose, stop operation and tighten it to specified torque. In case of hose damage, stop operation immediately and contact Sany HM authorized dealer.

100 2022-09-06 Replace the hose immediately in case of the following problems

- Damage or leak of hydraulic hose fitting.
- Damage or break of outer cover, or exposed steel wires of reinforcement layer.
 - Ballooning outer cover in some places.
 - Impurities in outer cover.
 - Distortion or crushing of movable parts.

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The hydraulic system is always under pressure. Make sure pressure in hydraulic site has been relieved before ing the lines. Residual pressure in the circuit may cause serious accidents:

- Release system pressure before maintaining the hydraulic system:
 - 1. Release system pressure before maintaining the hydraulic system
- 2. release pressure of pilot pipes. Within 15 seconds of engine shut-off turn the key on, unlock safety lever, and operate the directions stick fully to release pressure from accumulator.

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- Diesel oil or pressurized hydraulic oil can and to find the many of hydraulic oil with naked eyes. A cardboard or wooden board is necessary for checking for leaks. Do not touch lead liquid with here penetrate skin or eyes, causing serious infor checking for leaks. Do not touch leaking safety goggles to protect your eyes. If any liquid penetrates your skin, flush with clean water immediately and get medical attention as soon as possible.
- The fuel lines are under high pressure when the engine is running. When checking or d.federico 2022-09-06 servicing the fuel system, shut down the engine and wait for 30 seconds till internal pressure drops prior to operation. d feder

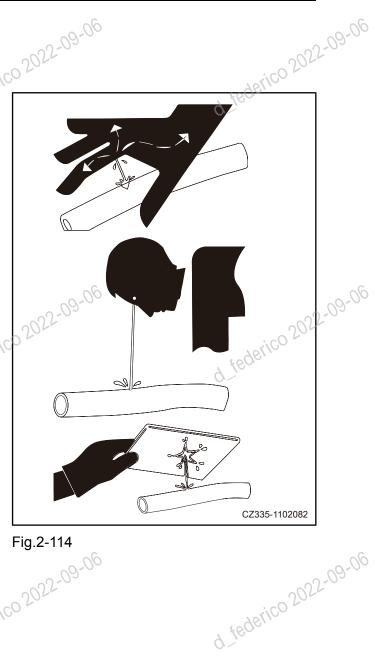


Fig.2-114



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2.5.13 Welding operation

zrico 2022-09-06 Welding operation may lead to fire or electric shock. Only qualified welders are allowed to conduct welding operation using proper equipment.

2.5.14 Maintain Air-conditioner safely

WARNING

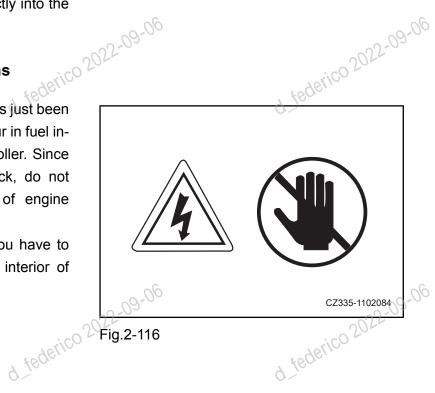
- Refrigerant R134- a is a harmless gas under room temperature. It will change into highly toxic gas when burning.
- Keep fire source away when servicing aircondition system.
 - In maintenance of air-conditioning system, observe the instruction on the refrigerant cylinder and use it correctly. The type of refrigerant is R134a. Use of other refrigerants may damage the air-conditioning system.
 - Obey local material disposal regulations. Never discharge refrigerant directly into the air.

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Fig.2-115

2.5.15 High voltage precautions

- When the engine is running or has just been shut down, high voltage can occur in fuel injector terminal and engine controller. Since there is danger of electric shock, do not touch fuel injector or interior of engine controller.
- Please contact Sany dealer if you have to access fuel injector terminal or interior of d federico 2022-09 engine controller.



Accumulator contains highly pressurized nitrogen. Improper operation of accumulator can cause explosion Therefore, the following precautions must be observed:

- Do not disassemble the accumulator.
- Do not let the accumulator be near a fire source or exposed in flame.
- Do not drill, weld or flame- cutting the accumulator.
- Do not punch, weld or flame- cut on accumulator.
- The gas must be released when disposing of the accumulator. Contact Sany dealer for this disposal.



2.5.17 Fire and explosion prevention

WARNING

- Never smoke when handling the fuel or maintaining the fuel system. The gases in empty fuel tank can cause explosion easily, never carry out flame-cutting or welding operation on fuel pipe, fuel tank or fuel vessels, which can lead to fire, explosion, injury or death.
- Then engine must be shut down and electrical equipment must be switched off when refueling the tank. Be extremely careful when adding fuel to a hot engine. No sparks shall occur around the grounding nozzle.
- Handle all solvents and dry chemicals in a place with good ventilation according to the steps indicated on vessel.
- Clean the machine of all dust and residuals. Do not place greasy rag or other flammable materials on machine.
- When cleaning the parts and components, use nonflammable solvents instead of gasoline, diesel oil or other flammable fluids.
- Store flammable liquids and materials in suitable vessels as required by safety laws and
- Check fire extinguishers, fire-fighting system and fire detectors (if equipment) and make sure
 they are ready for use. d federico d federico

2.5.18 Regular replacement of safety-related parts

- erico 2022-09-06 Safety-related parts such as hoses and seat belt must be replaced regularly for the consideration of operating the machine safely in a long term.
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 - Repair or replace any safety parts once found defective regardless of its service time.

2.5.19 Maintenance operation

- Check all parts and replace the worn, broken and damaged parts during repairing operation. Over-worn and over-damaged parts may fail in operation and cause injury and death. Replace damaged or illegible signs and marks.
 - Tighten all fasteners and connectors to specified torque.
 - Install all guards, covers and hoods after repair and service. Replace or repair dam- aged guards. Only the type of hydraulic oil approved or recommended by Sany should be used to make up the hydraulic system.
- Start the engine and check for any leaks (check the hydraulic system), and operate all control devices to be sure of their proper functioning. Make road test if necessary. Shut down the engine and check the work you have done (see if there are missing pins, gaskets and nuts). Check auli d.federico 2022-09-06 again all hydraulic oil levels prior to operation. d federico 2022-09-06

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Improper disposal of wastes harms the environment and ecology. Consult local environmental protection densities for methods of recycling and waste disposal.

- Potential harmful substances used in Sany products include hydraulic oil, fuel, cooling liquid, refrigerant, filter and batteries etc.
- Use leak-proof vessels to hold discharged fluids. Do not use food or beverage containers.
- Do not dump waste fluids directly to the ground, sewage or water source.
- Leaking of refrigerant from air conditioner can spoil the atmosphere of the globe. Related laws and regulations must be followed to recover or regenerate the refrigerant.

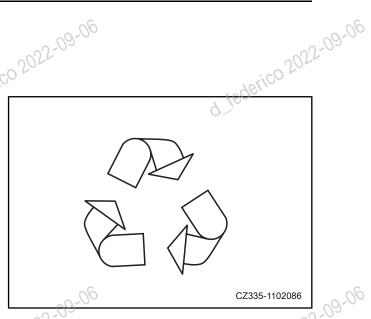
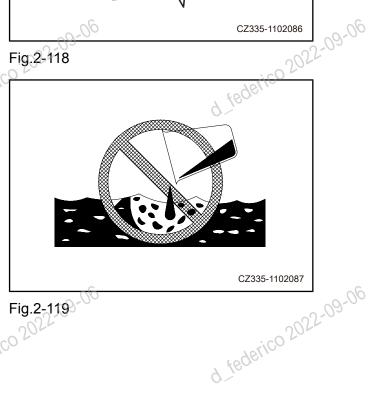


Fig.2-118



d federico 202 Fig.2-119

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Technical Specifications

| 00-00 | 00-00 | 00-0 |
|----------------------------|--------------------|------|
| 3 Technical Specifications | ~72 ⁻⁰³ | 3-1 |
| 3.100 | :100 Joh | 3-3 |
| 3.2 Overall dimensions | 169611 | 3-3 |
| 3.3 Digging Range | 3/ | 3-4 |
| 3.4 Technical Parameters | | 3-5 |

d. federico 2022-09-06

d_federico 2022-09-06

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WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operation or maintaining it. Failure to do this could result in death or serious injury. d federico 202

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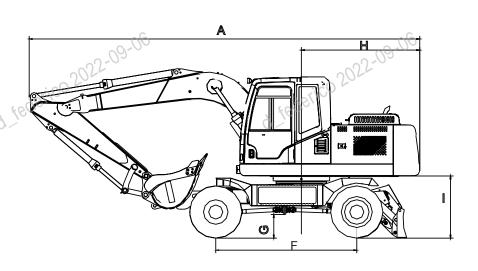
3.Technical Specifications

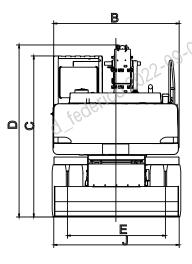
3.100

d federico 2022-09-06 WARNING

Read and follow the safety precautions and instructions in this manual and on the machine decals. Failure to do can cause serious injury, death or property damage. Keep this manual with the machine for reading and future reference.

3.2 Overall dimensions

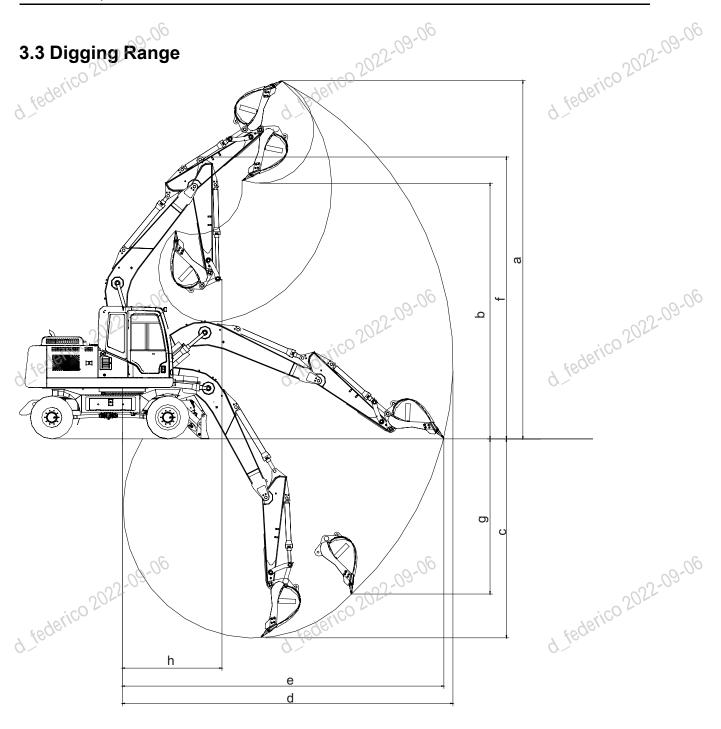




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Unit: mm

| | Item | | SY155W |
|-------|-----------------|---|-----------------|
| - | *CO#072 | Overall length (transportation) | 7690 |
| , 48 | B Overall width | | 2490 tederro |
| 9-, | С | Overall height (Till the top of the cabin) cabin) | 3200 |
| • | D | Overall height (Travelling) | 3610 |
| - | Е | Wheel distance | 1944 |
| | F | Spread of axles | 2800 |
| | G | Minimum ground clearance | 360 |
| - | Н | Tail swing radius | 2310 |
| • | I | Counterweight clearance | 1230 |
| - | 3022- | Blade width | 2490 |
| d ter | Jerico Buzz | d federico is | d federico 2022 |



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| 2022-09-06 | | 2022-09 | 3-06 | | Unit::mm | | |
|---------------|------------------------|------------------|-------|-------------|------------------|--|--|
| rico 2011 | Item | rico 2011 | | SY155W | Silk Italii | | |
| a | Maximum dig | ging height | | 8600 | /87 , | | |
| b | Maximum unlo | pading height | | 6200 | | | |
| С | Maximum di | gging depth | | 4800 | _ | | |
| d | Maximum dig | gging radius | | 7960 | | | |
| е | Maximum ground | d digging radius | | 7750 | | | |
| f | The maximum he turning | • | | 6800 | | | |
| g | Maximum vertica | al digging depth | 06 | 4390 | | | |
| h09-0 | Minimum tur | ning radius | 2-30 | 2400 | | | |
| 3.4 Technical | Parameters | • | d fed | Selico Sara | | | |
| I M | lachine Rucket vol | Travel | Swing | Engine | Power rate | | |

3.4 Technical Parameters

| | Machine weight | Bucket vol. m³ | Travel speed (high/low) | Swing speed | Engine model | Power rate kW/rpm |
|--------|-------------------|-------------------|-------------------------------|----------------|-----------------|----------------------|
| SY155W | 13500 | 0.58 | 37/10 | 12.5 | ISUZU 4HK1X | 120/2000 |

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Operation

| 4 Operation | 4-1 |
|--|------|
| 4.1 Operation | 4-5 |
| 4.1.1 Machine Overview | 4-5 |
| 4.2 Controls and instruments description | 4-6 |
| 4.2.1 Monitoring System | |
| 4.2.2 Monitor operation | 4-10 |
| 4.2.3 Switches | 4-22 |
| 4.2.3.1 Summarize | 4-22 |
| 4.2.3.2 Starting up switch | 4-22 |
| 4.2.3.3 Throttle knob | 4-24 |
| 4.2.3.4 Work lamp switch | 4-24 |
| 4.2.3.6 Cabin lamps | 4-25 |
| 4.2.3.6 Cabin lamps | 4-25 |
| 4.2.3.7 Cigarette lighter and auxiliary power supply | 4-26 |
| 4.2.3.7 Cigarette lighter and auxiliary power supply | 4-26 |
| 4.2.3.9 Climbing switch | 4-27 |
| 4.2.3.10 Reversing alarm release switch | 4-27 |
| 4.2.4 Joystick, pedals | 4-28 |
| 4.2.4.1 summurize | 4-28 |
| 4.2.4.2 Safety lock lever | 4-29 |
| 4.2.4.3 Joysticks | 4-30 |
| 4.2.4.4 Brake pedal | |
| 4.2.4.5 Accelerating pedal | 4-33 |
| 4.2.5 The steering column switch and indicator | 4-34 |
| 4.2.5.1 Summurize | |
| 4.2.5.1 Summunze | 4-34 |
| 4.2.5.2 Combination switch (left lever) | 4-36 |
| 4.2.5.4 Parking brake indicator | |
| 4.2.5.5 Operating mode indicator | 4-38 |

| 000 | 30.0 |
|--|------------------------|
| 4.2.5.6 High beam | 4-39 |
| 4.2.5.6 High beam4.2.5.7 Damping lock on indicator | 4-39 |
| 4.2.5.8 Park / Work / Travel mode select button | 4-40 |
| 4.2.5.9 Warning light switch | 4-40 |
| 4.2.5.10 Damping cylinder lock switch | 4-41 |
| 4.2.6 Top window | 4-42 |
| 4.2.7 windshield | 4-43 |
| 4.2.8 Cab windows and doors | 4-50 |
| 4.2.9 Cup holder | 4-51 |
| 4.2.10 Ash tray | 4-51 |
| 4.2.11 Information kits | 4-51 |
| 4.2.12 Beverage holder | 4-52 ₁₀ 000 |
| 4.2.13 Emergency exit | 4-52 |
| 4.2.14 Fire extinguishers | 4-53 |
| 4.2.15 Controller | 4-54 |
| 4.2.17 Information kits 4.2.12 Beverage holder 4.2.13 Emergency exit 4.2.14 Fire extinguishers 4.2.15 Controller 4.2.16 Fuse piece | 4-54 |
| 4.2.17 Air Conditioning System | 4-55 |
| 4.2.17.1 Control panel | 4-55 |
| 4.2.18 Radio | |
| 4.2.18.1 Control panel | 4-57 |
| 4.2.18.2 Control buttons and liquid crystal display | 4-58 |
| 4.2.18.3 Radio operation | 4-60 |
| 4.2.19 Door locks | 4-63 |
| 4.2.20 Lockable cover | 4-64 |
| 4.2.20.1 Summurize | 4-64 |
| 4.2.20.2 Open and close the cover with the lock | 4-64 |
| 4.2.20.3 Open and close the lock cover | 4-65 |
| 4.3 Operation and control of the machine | 4-66 |
| 4.3.1 Before start the engine | 4-66 |
| 4.3.1.1 Inspection | 4-66 |
| 4.3.1.2 Check before the start of the engine | 4-67 |
| 4.3.1.3 Adjustment before operation | |
| 4.3.1.4 Operation before staring engine | 4-78 |
| 4.3.2 Start the engine | 4-79 |
| 4.3.3 Engine Preheating 4.3.4 Warming-up operation 4.3.5 Machine operation 4.3.5.1 summurize 4.3.5.2 Turn off the engine | 4-82 |
| 4.3.4 Warming-up operation | 4-83 |
| 4.3.5 Machine operation | 4-84 |
| 4.3.5.1 summurize | 4-84 |
| 4.3.5.2 Turn off the engine | 4-84 |
| 4.3.5.3 Machine travelling | 4-85 |
| 4.3.5.4 work equipment control and operation | 4-92 |

| | 00/20 | 00/20 | 10/20 |
|---------|---|--|-------------------|
| | 4.3.6 Actions Forbidden | <u> </u> |)4 |
| 101 | 4.3.7 Allowed Water Immersion Depth | 4-9 4-9 4-9 4-9 4-9 |)7 |
| 4 fedie | 4.3.8 Operating on slopes | 4-9 | 18 |
| 0 | 4.3.8.1 summurize | 4-9 | 18 |
| | 4.3.8.2 Engine Stalls on a Slope | 4-9 | 9 |
| | 4.3.8.3 Cab Door Operations in the slop | e4-9 | 9 |
| | 4.3.9 Recommended use | 4-10 | 00 |
| | 4.3.9.1 summurize | 4-10 | 00 |
| | 4.3.9.2 Backhoe Operation | 4-10 | 00 |
| | 4.3.9.3 Trenching Operation | 4-10 |)1 |
| | 4.3.9.4 Loading Operation | 4-10 |)1 |
| | 4.3.10 Parking | 4-10 | 12.00 |
| | 4.3.11 Maintenance for Daily Operation | 4_ 10 |)3 |
| 101 | 4.3.12 Locking | 4-10 4-10 4-10 |)4 |
| 4 fedle | 4.3.13 Cold weather operation | 4-10 |)5 |
| 0.7 | 4.3.13.1 Operations in Cold Environmer | nt 4-10 |)5 |
| | 4.3.13.2 Maintenance after Daily Opera | tion 4-10 |)5 |
| | 4.3.13.3 Maintenance after Cold Season | n4-10 |)6 |
| | 4.3.14 Long-term storage | 4-10 |)6 |
| | 4.3.14.1 Prior to storage | 4-10 |)6 |
| | 4.3.14.2 During Storage | 4-10 |)7 |
| | 4.3.14.3 Operations After Storage | 4-10 |)7 |
| | 4.3.14.4 Start engine after long storage | 4-10 |)7 |
| 4.4 | transportation | 4-10 | 18, ⁰⁰ |
| | 4.4.1 Summurize | J.Z4-10 | 8(|
| 46% | 4.4.2 Transport by Road | 4-10 4-10 4-10 4-10 4-10 4-10 | 8(|
| d 1800 | 4.4.3 Transportation Methods | 4-10 | 8(|
| | 4.4.4 Trailers for loading and unloading ma | achine 4-10 |)9 |
| | 4.4.4.1 summurize | 4-10 |)9 |
| | 4.4.4.2 Loading | 4-10 |)9 |
| | 4.4.4.3 Fastening Machine | 4-11 | 11 |
| | 4.4.4.4 Unloading | 4-11 | 4 |





d. federico 2022-09-06

d_federico 2022-09-06

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WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operation or maintaining it. Failure to do this could result in death or serious injury. d federico 2002

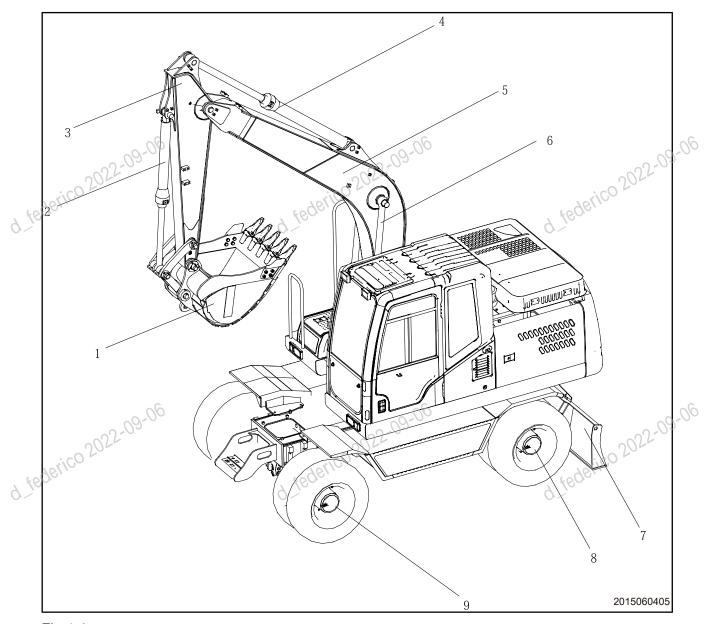
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4.Operation

4.1 Operation

4.1.1 Machine Overview



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Fig.4-1

- [1] Buckets
- [2] Bucket cylinder
- [3] Stick
- Stick Cylinder
 - [5] Boom

- [6] Boom cylinder
- [7] Dozer
- [8] Rear axle

4.2 Controls and instruments description federico 21

4.2.1 Monitoring System

CAUTION

- Immediately stop working when warning indicator lights on, check and maintain the relevant parts.
- The display does not show all the work status of the machine.
- When maintaining and checking the machine, do not rely only the display shows.

Display panel integrated monitoring mode, working mode selection and electrical components switching function.

Display Appearance

The display consists of three parts:

A: alarm and signal indicating zone

B: main display area

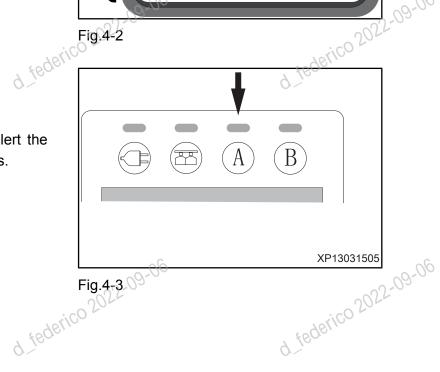
C: keypad



zrico 2022-09-06 Alarm and signal indicator

Malfunctioning alarm

Malfunction warning indicator on to alert the user to find out the malfunctioning parts.





Main screen area

When the start switch is on "ON" position, the display is powered by a battery and boot into the initial interface. Full screen display working status display as shown at right side:

- [1] The current date and the current time
- (2) GPS signal indicator
- [3] Working status indicator
- [4] Fuel level gauge
- [5] Locking indication
- [6] Engine speed
 - [7] Maintain instructions
 - [8] Coolant thermometer
 - [9] Working mode indication
 - [10] Automatic idling function icons
 - [11] Working device selection icon
 - [12] Into the "malfunction code" icon

 - [15] Charging indicator
 - [16] Preheat indicator
 - [17] Error code
 - [18] Forward, backward, idling indicator
 - [19] Working hours
 - Work mode and the engine gear indicator 1
 - Coolant thermometer: pointer according to \(\) the coolant temperature varies between the minimum and maximum values, expressed in the range of 0 to 120 degrees.



Fig.4-4

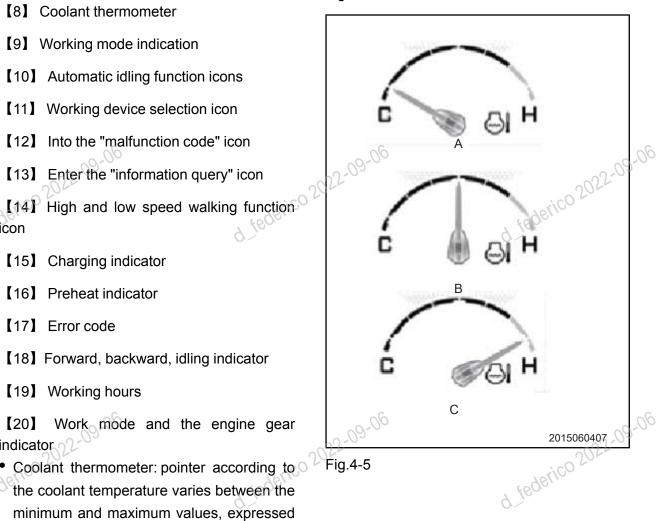


Fig.4-5

A: Indicate the engine just started.

tederico 2022-09-06 B: Normally display when the temperature is in the 0 to 100°

C: When the temperature exceeds 103 degrees then the pointer enters the red zone, while warning indicator is on.

Temperature back to below 100 degrees, the alarm indicator automatically turns off.

• Fuel level gauge: Point the fuel volume between the maximum and minimum, indicate the range from 0 to 100%.

A: fuel position less than 10%, the alarm indicator light on.

d federic B: Fuel volume more than 14%, the alarm indicator goes off.

C: Fuel fully charged.

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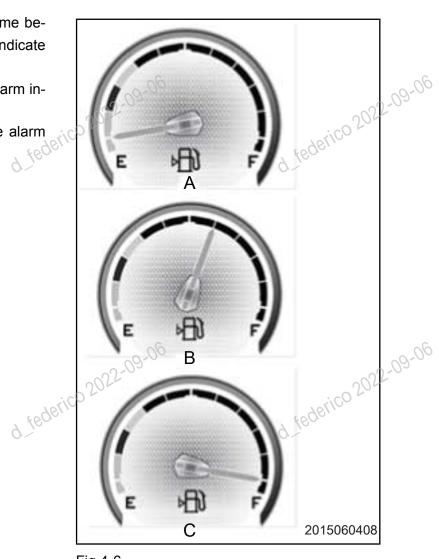


Fig.4-6

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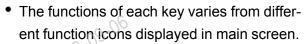
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Keypad 022-09-06

Keypad contains two parts, the operation keys and Function keys.

Function keys

Key F1、F2、F3、F4、F5 (as right pic shows), These five keys corresponding to their functions as the main function icons showed in above main display area.



• While the main screen display area without a corresponding function icon is display. a corresponding function icon is displayed, the function key is invalid.

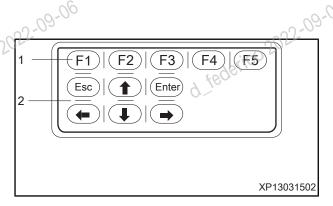


Fig.4-7

Some common function icons corresponds keys as the following table

| | Keys | Icons | Func tions | Displayed as |
|------|-------------------|---------|---|------------------------------------|
| | F1 | S | Working mode Switch ing | S, H, L, I |
| d 16 | 96/ £3 0 5 | D2-96 | Idle / Non-idle status switch ing | Idle / Non-idle |
| | F3 | | Tool Selec tion | Buckets, hammers, hydraulic shears |
| | F4 | © 09.06 | Enter the selec tion / setting items | The same function as 'Enter'. |
| d fe | derico? | 6 | Select information query | d. federico 20:22-09-06 |

| | 00-00 | | 20-00 | 20-00 |
|----------|-------|----------|-----------------------------|---------|
| | 22-00 | Return | The same function as 'Esc'. | 0022-03 |
| 13 | | to the | rico Lo | rico Lo |
| , tege1, | | previous | gerr | tege,, |
| 9., | | screen | | 9, |

Operation buttons

| Operation buttons | Functions | |
|-------------------|---|-------|
| Enter | Enter the selection / setting items | |
| ESC | Return to the previous screen | |
| • | Select the item above (returns to the bottom item after the top item); or increase the value where the cursor blinks. | - C |
| 2022-09-00 | Select the item below (returns to the top item after the bottom item); or decrease the value where the cursor blinks. | 09-06 |
| d federico | Move the cursor to the left (returns to the right end digit after the left end digit). | |
| • | Move the cursor to the right (returns to the left end digit after the right end digit). | |

4.2.2 Monitor operation

Home page

The Home page is the normal operation display of the monitor.

Operation 2

- 1. Operating statues selection. Use the working status selection knob on the steering column to select the operating states, followed by P,W,T Modes.
- P mode , Parking mode, the vehicle no action, the engine maintain minimum speed 1,000 rpm, for engine start and stop state indication
- W mode , working mode, up-body and platform can work, this mode applies on excavating ?!
- T mode, moving mode, up-body no action, platform can move, this mode applies on moving from site to site.



Fig.4-8



2. Working mode selectionWhen the upper left corner status is displayed as W, use F1 to select the operating mode. Each time you press the bu. on, the modes cycle through: $H \rightarrow L \rightarrow S \rightarrow H$, when the upper le corner status displays P or T, the mode button displays I.

NOTE: The default operating mode is S mode while at W operating statue.

3. Automatic idling selection choose F2 to cancel and start automatic idling. When the symbol appears above F2, press this key to cancel automatic idling function; when the symbol is displayed above F2, press this button to start automatic idling function.

Note: After power-up, automatic idling mode will be set at 'start' mode default.

- By default, when automatic idling switch is on, when all levers are in the neutral position, after 5 seconds, automatically start idling state (speed controller automatically adjusted engine speed to idling speed), in order to save fuel and reduce noise.
- In idling state, if the action or gears change are detected by the controller, it automatically returns to the speed of the respective gear.
 - 4. Walking speed selectionWalking speed knob on the right side of the steering column switches high-low walking speed. PositionIre-presents low-speed travel; Position II represents high-speed travel. Rabbit and tortoise are displayed on screen to represent the high speed and low speed
- High and low speed switching after engine is on and only can be carried out when at W or T condition. in order to switch the state and executed in W or T state;

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erico 2022-09-06 It is not recommended to switch from high speed to low speed while traveling, but switching from low speed to high speed is allowed during traveling.

5. Malfunction information inquiry

When the monitor warning indicator is on, malfunction code will be shown on the bottom of the display. Above F4 area appears as red color. Symbol. Press this button to enter in to the query pages of malfunctioning information.

6. System Information inquiry.

.un federico 2022-09-06 Press F5 to enter into the System Information inquiry page.

Note: Before entering the System Information page a password is required. Please contact your local dealer for the password.

Working mode selection under W condition:

When in the W state, the display shows the initial page, you can click on the F1 button on the display to select the operating mode. Different modes of operation have been optimized in accordance with the relevant requirements of the working conditions. Engine speed controlled by the d federico 2022-09-06 knobs and accelerator pedal jointly, the higher speed of them corresponds to the engine speed accordingly.

- H mode, heavy loading mode, high efficiency working mode.
- S mode, standard mode, in balance of efficiency and fuel consumption.
- L mode , light loading mode , fuel saving mode. W mode position / speed Introduction:

| Mode | Position | Speed (rpm) | Mode | Position | Speed(r pm) | Mode | Position | Speed(r pm) | |
|------------|----------|------------------|------|----------|-----------------|------|----------|--------------|-------|
| | 1 | 1000 | | 1 | 1000 | | 1 | 1000 | |
| | 2 | 1100 | | 2 | 1100 | | 2 | 1100 | |
| | 3 | 1200 | | 3 | 1200 | | 3 | 1200 | C |
| Н | 409-0 | 1300 | S | 4 | 1300 | ı | 4 | 1300 | 09-06 |
| | 2025 | 1350 | 3 | 5 | 1350 | L | 5 | 1350 | L |
| i derico | 6 | 1400 | | 76.6CO | 1400 | | 6 | 1400 | |
| d federico | 7 | 1450 | 9 | 7 | 1450 | | 7 3 | 1450 | |
| - <u>-</u> | 8 | 1500 | | 8 | 1500 | | 8 | 1500 | |



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| | 00-06 | | | | 00-06 | | 20-06 |
|-----------|-------|------|--------|-------|-------|--------|---------|
| 202 | 2-9 | 1550 | | 9,22- | 1550 | | 2022-03 |
| Jarico Lo | 10 | 1600 | 19(10) | 10 | 1600 | lise | ;0 L |
| 9 160g. | 11 | 1700 | 9 1600 | | | y teor | |

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Walking control under state T: Under state T, the accelerator pedal and knob control the engine speed. When the accelerator pedal is in different positions, the engine will be at the appropriate gear, the throttle control the minimum engine speed, when fully stepped the brake the engine idling at minimum speed.

T mode position / speed Introduction:

| Position | Speed (rpm) |
|------------|-------------|
| 1 | 1000 |
| 2 | 1100 |
| 3 | 1200 |
| 4 | 1300 |
| 5 | 1400 |
| 6 | 1500 202 |
| r derice 7 | 1600 derice |
| 9 9 | 1700 |
| 9 | 1800 |
| 10 | 1900 |
| 11 | 2000 |

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Information Menu password entry

Put F5 to access the "Information Menu". A password is required to access the "Information Menu".

Operation

- Press F1 to change the number where the cursor blinks in an ascending order. You can also use or to increase or de-crease the number.
- Press F2 to move the cursor to the right. You can also use or to move the cursor to the left or to the right...
- Press F3 to access "Time adjustment" page.
 - Press F4 to access "System unlocking" page.
 - Press F5 or ESC to return to "Main page".
 - · Press Enter to verify the password, if correct, it will be shift to "Information Page".

Time Adjustment

Press F3 on "Information Menu" to access "Time Adjustment" page.

It shows the time setting.

Key Operation Instruction

- Press and to reduce or increase the number of highlighter.
- Press

 and

 to move highlighter left or
- Press F1 to confirm your choice.
- Press F5 to return to info menu. d federico 2022-09-06

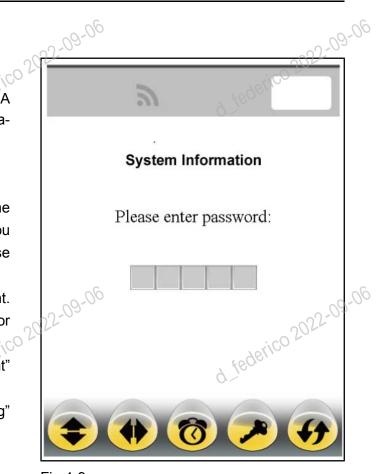


Fig.4-9

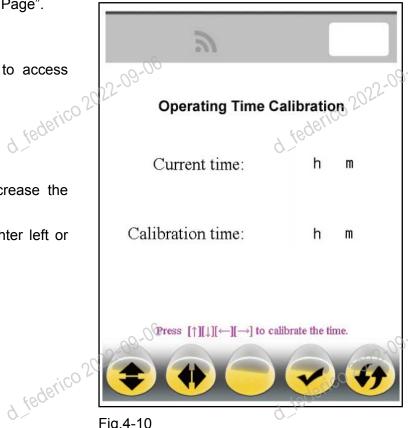


Fig.4-10



Information Menu

Type in correct password and then press enter to access into the page of information menu. The information menu is a list of system functions. On this page, you can select and access any of the items on the list. There will be function introduction on bottom of the screen.

Functions

- •••
- Press F1 to select the item below the high-lighted one. The highlighter returns to the top after the bottom item. You can also use.
 Press F1 to select the item below the highlighted one. The highlighter returns to the top after the bottom item. You can also use and to move the highlighter left, right, up and down.
- Press F4 on this page to go to the Password Entry page before accessing the System Setup page.
- Press F2 or Enter to access the selected entry. Press F5 or ESC to return to the Home page.



Fig.4-11

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Engine & Throttle Signal

Select "Running Parameter" on the Information Menu page and press F2 or Enter, and the display moves to Engine & Throttle Signal page. This page is a real-time display of the running parameter of the engine and throttle. Operation

- Press F1 to go to "Pilot Pressure Signal" page.
- Press F5 or ESC to return to the "Information Menu" d federico 2022

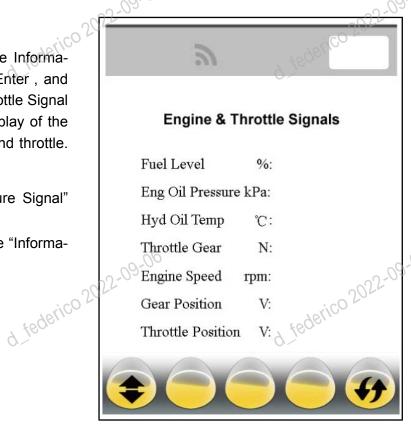


Fig.4-12

Main Pump & Main Valve Signal

Press F1 on this page and enter into page of 'Main Pump & Main Valve Signal' This page is a real-time display of the main pump and main jederico 20 valve signals of the hydraulic system.

Operation

- Press F1 to go to "Engine & Thro. le Signal" page.
- Press F5 or ESC to return to the "InformaĀon Menu".

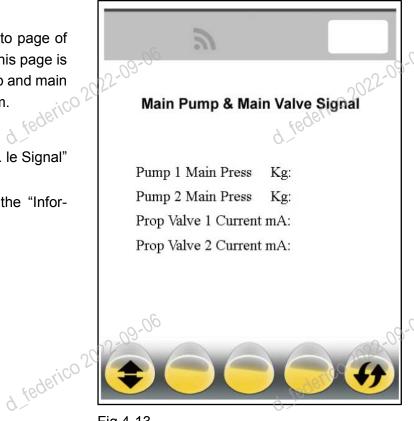


Fig.4-13



Input switch signal information

Press F1 on and enter the page of "Input switch signal information

Function:

- Press F1 to switch to "output switch signal"
- Press F5 or Esc to return to page of information menu.

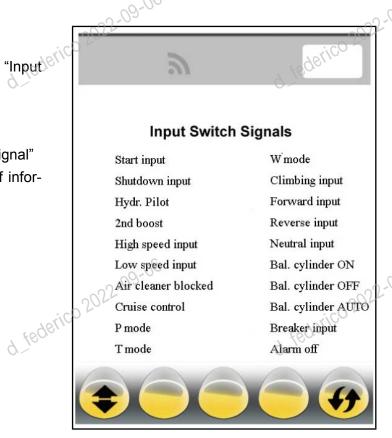


Fig.4-14

Output switch signal information

Press F1 on and enter the page of "Output switch signal information"

It shows all output signals.

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Function:

- Press F1 to switch to "engine and throttle signal"
- Press F5 or Esc to return to page of information menu.

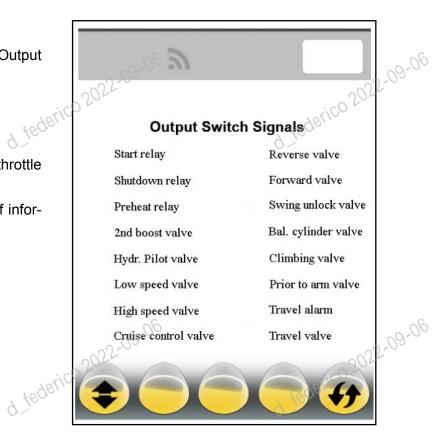


Fig.4-15

Machine configuration

Choose machine configuration on page of information menu and press F2 or enter. The page shows key components of the machine.

Function:

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Press F5 or Esc to return to page of information menu.

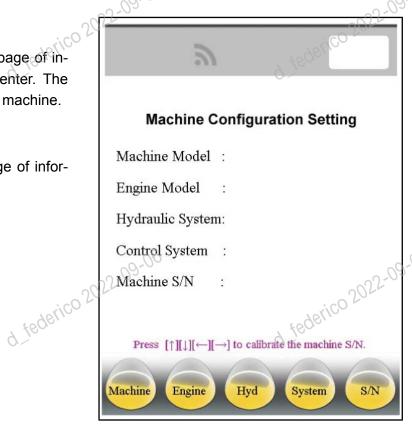


Fig.4-16

Fault Information

Select "Fault Information" on the Information Menu page and press F2 or Enter, and the display moves to Fault Information page. This page lists important machine fault information.

Operation

- Press F1 to go to the next page.
- Press F5 or ESC to return to the "Information Menu".

Note: when there is fault alarm on main page, preessF4and enter into page of fault information manual

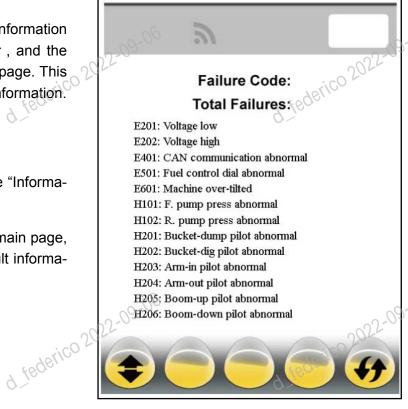


Fig.4-17



System Language

Select "System Language" on the Information Menu page and press F2 or Enter, and the display moves to this page.

Operation

- You can also use or to select a system language on the list.
- Press F5 or ESC to return to the "Information Menu".

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Fig.4-18

GPS monitoring

Select "GPS Monitoring" on the Information Menu and press F2 or Enter to view this page.

Operation

Press F5 or ESC to return to the "Information Menu".

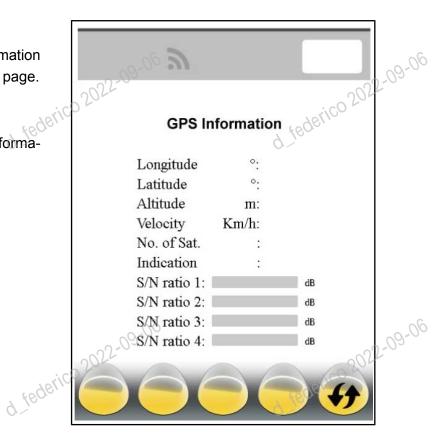


Fig.4-19

Maintenance information look up

Everyday during first charge the display will show maintenance items for today.

When there is a signal of $\ \ \ \$ press $\ \ \ \$ to enter into the page of "maintenance info look up" The page will show different maintenance information. It is divided in 50 hours, 250 hours, 500 hours, 1000 hours, 2000 hours and 4000hours.

Function

- After the maintenance is done, press F4 or Enter to confirm.
- Press F3 to enter the page of maintenance cycle and maintenance content.
 - Press F5 or ESC to return to the "Information Menu".

Note: Please contact local Sany dealer for password.



Fig.4-20

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4.2.3 Switches

4.2.3.1 Summarize

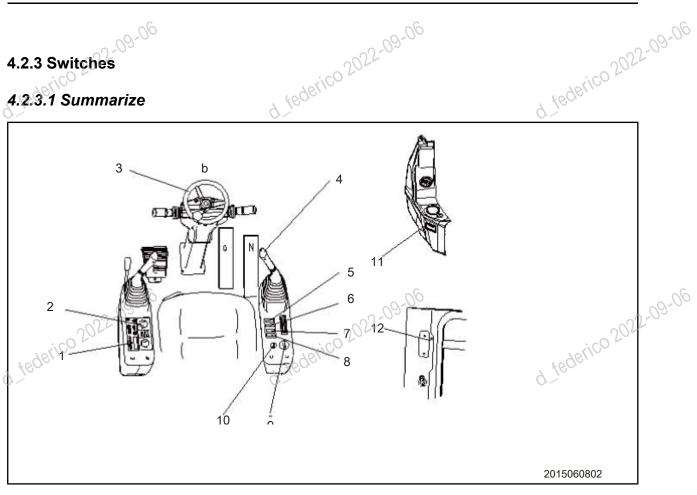


Fig.4-21

- [1] Radio
- [2] Air condition
- [3] Steering Wheel
- [4] Horn Switch
- Norking lamp switch
 - [6] Head lamp switch

- [7] Climbing switch
- [8] Reversing alarm release
- [9] Throttle knob
- 10) Starting switch

 - [12] Cabin lamp switch

4.2.3.2 Starting up switch

Starting up switch is for turn the engine on and off. It has 4 positions surrounding: HEAT, OFF, ON and START.

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OFF position

This is the position for the insertion and removal of the ignition key. When the key slot points to OFF position, all devices in the electrical system are power off. To stop the engine, turn the ignition key from ON position to OFF position.

ON position

When the ignition key is turned to ON position, the electrical system is energized.

This is engine start position. To start the engine, turn the ignition key to this position. lease the key once the engine is started, and it returns to ON position automatically.

HEAT position

This is engine preheating position. Insert the ignition key, turn and keep it at the HEAT position to preheat the engine. It returns to OFF position automatically once released, and pre-

For machines with a preheat switch installed, the method of preheating the engine model. position is invalid position...

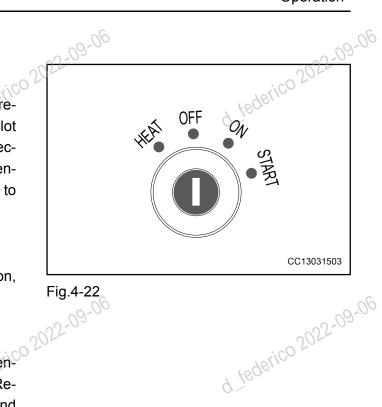


Fig.4-22



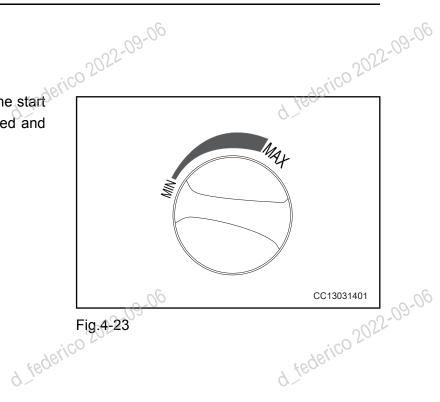
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The fuel control dial is located below the start switch. It is used to adjust engine speed output power.

MIN position: Low idle speed

MAX position: Full speed



derico 2022-09-06 4.2.3.4 Work lamp switch

Work lamp switch is used to turn on or turn off the work lamp(s) and cab lamp(s)

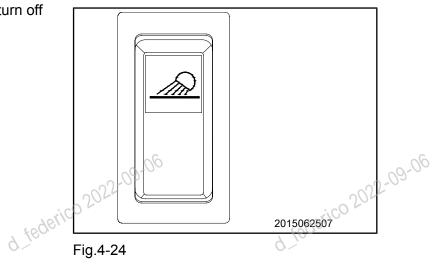


Fig.4-24

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Work lamp locations

a. One work lamp on the boom



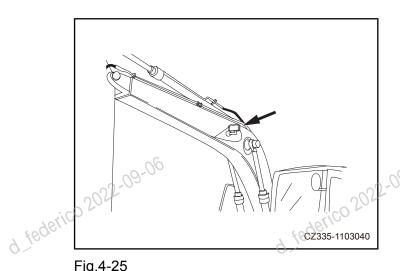


Fig.4-25

b. One work lamp on the right platform

CAUTION

Turn off the lamp while travelling on the road

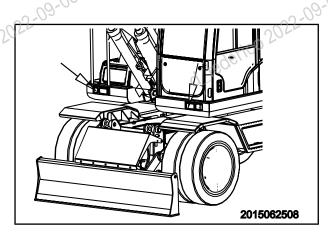
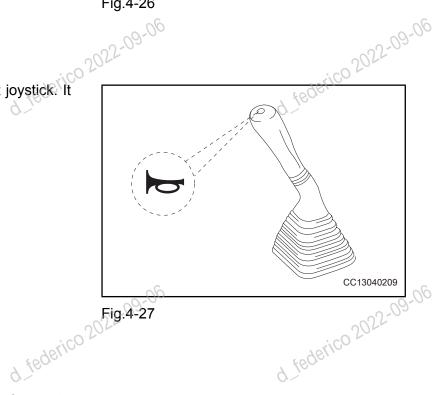


Fig.4-26

Horn switch on the top of the right joystick. It turns on the horn

Press and hold, to horn long time.



rico 2022-09-06 4.2.3.6 Cabin lamps

Indoor lights installed in the inside of the cab, pull the indoor light switch can "open" or "off" cab indoor lights.

Position (a): Lights on

Position (b) : Lights off

NOTE:

Even if the start switch is in the OFF position, d federico 29 it's possible to turn on the room lamp. d federico

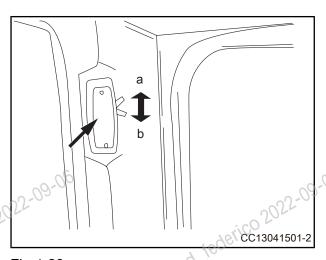


Fig.4-28

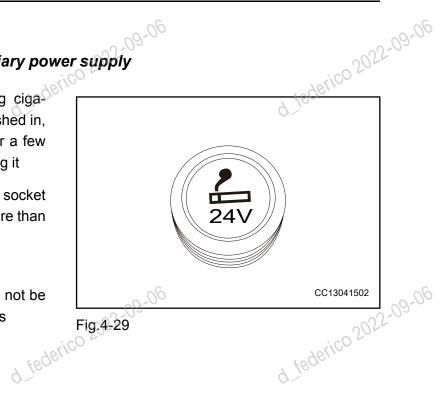
4.2.3.7 Cigarette lighter and auxiliary power supply

Use a cigarette lighter when ordering cigarettes. When the cigarette lighter is pushed in, it will return to its original position after a few seconds and can be used by unplugging it

If you remove the cigarette lighter, the socket can be used as power supply for no more than 240W (24V × 10A) equipment.

NOTE:

This cigarette lighter is 24V and should not be used as a power source for 12V devices



4.2.3.8 Headlamp switch

Headlamp switches are used to control the headlamps and rear taillights

- Position 1, turn on the front and tail lights
- Position 2, turn on the front and tail lights and headlights

Distance light adjustment refer to Steering d federico 2022-09-06

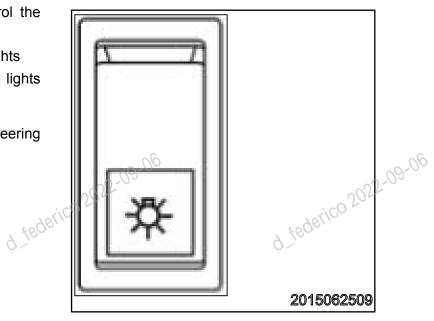


Fig.4-30





Press this switch when climbing to improve the traction of the excavator, while this "machine travels slower" mudding muddy area.

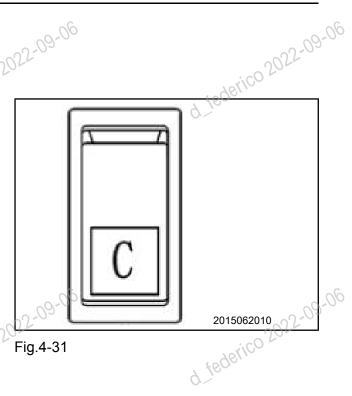


Fig.4-31

d_federico 2022-09-06

d_federico21 4.2.3.10 Reversing alarm release switch

At W mode, use this switch to turn off the reverse alarm.

Note: At T mode, it can not turn off the reverse alarm



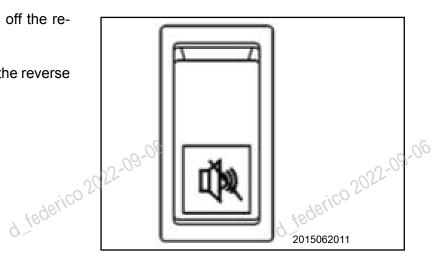


Fig.4-32



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4.2.4 Joystick, pedals

4.2.4.1 summurize

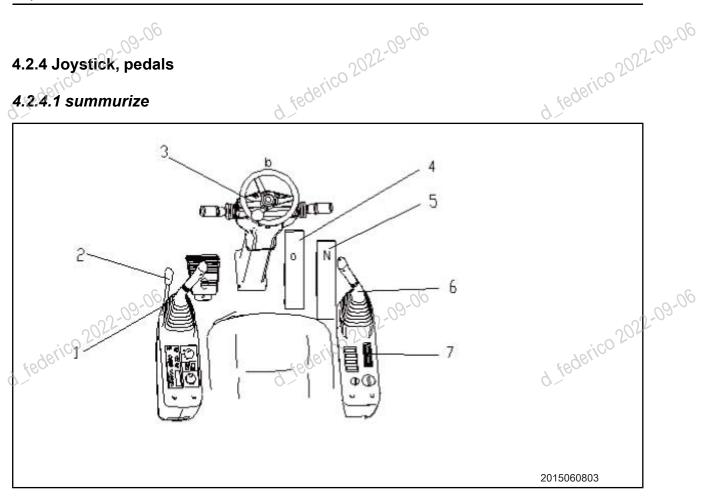


Fig.4-33

- [1] Left joystick
- [2] Safety lock lever
- [3] Steering bar
- [4] Brake pedal
 - [5] Accelerating pedal
 - [6] Right joystick
 - [7] Dozer joystick

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4.2.4.2 Safety lock lever

WARNING

- When leaving the cab, securely lock the safety lock lever in the locked position. If the safety lock lever is not in the locked position, accidental touching the joystick can result in serious injury or death.
- If the safety lock lever is not firmly seated in the locked position, the joystick may be moved, resulting in a serious accident. The joystick situation is checked as shown in the figure.
- When pulling or pushing the safety lock lever, be careful not to touch the left side handle.

The safety lock lever is a device for locking the working device, turning, walking and attachment joystick (if equipped).

- Locking position : Lift a up the safety lock lever and apply the lock. The machine does not move even if the operation handle and the accelerator pedal are operated.
- safety lock lever to unlock. This lever is a hydraulic lock lever. Therefore, when it is in the lock position, the joystick or control pedal is moved, but the machine does not move.

When all the switches are in the neutral position, when the safety lock lever is set to the unlock position, if any parts of the machine is activated, the machine failed. In this case, imcontact with Sany Heavy Machinery or its authorized agent. mediately pull the safety lock lever back to the

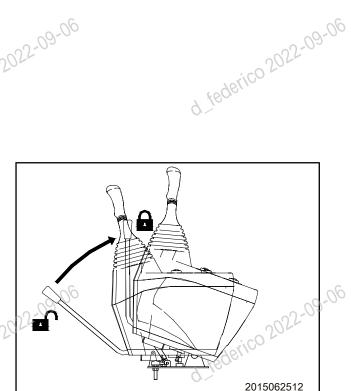


Fig.4-34

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4.2.4.3 Joysticks

WARNING

- d federico 2022-09-06 · Do not expose any part of the body out of the window. If you accidentally hit or hit the boom handle for any other reason, you will have a risk of injury to the arm. If the windows are missing or damaged, they should be reinstalled or replaced immediately.
- · Before operating, familiarize yourself with The following is only an example in SAE mode. For details, refer to "Work Device" trol and Operation" on an

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| Left joystick Left joystick action | | | |
|-------------------------------------|-------|--------------------|--|
| Left joystick action | | | |
| 1 | Front | Stick unloading | |
| 2 | Rear | Stick excavation | |
| 3 | Left | Turn left | |
| 4 | Right | Turn right | |

• Diagonal move the joystick action at the same time two functions, to perform comd federico 25 d federico plex actions

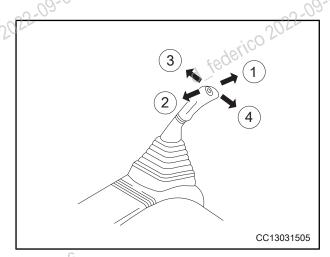


Fig.4-35

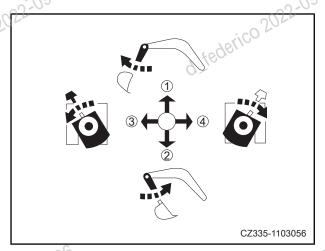
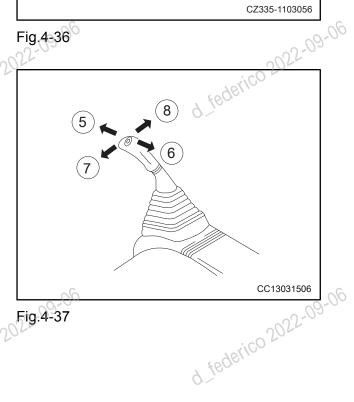


Fig.4-36

Right joystick

| ~1U~ | | //~ | |
|-----------------------|-------|---------------------|--|
| Right joystick action | | | |
| 5 | Front | Boom drop | |
| 6 | Rear | Boom lifting | |
| 7 | Left | Bucket digging | |
| 8 | Right | Bucket unloading | |

Fig:4-37 • Diagonal move the joystick actions at the same time two functions, to perform complex actions. d tederice



Dozer joystick 2-09-06

| Dozer joystick action | | | | |
|-----------------------|-------|---------------|--|--|
| 9 | Front | Dozer drop | | |
| 10 | Rear | Dozer lifting | | |

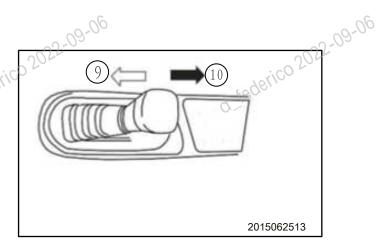


Fig.4-38

NOTE:

- In P, T mode, machine does not operate while operating joystick
- In W mode, the engine will be in the idle state if the operating pedal and the operating handle are in the neutral position for 5 seconds, even if the fuel control knob is above medium speed. If one of the joysticks is operated, the engine speed will rise to the speed Control knob Sets
- In the W mode, if the joystick and the operating handle are both in the neutral position, after about 5 seconds, the engine speed drops to the set speed (1100 rpm)
- When you release the joystick and the operating handle, it automatically returns to the neutral position and the machine function stops.

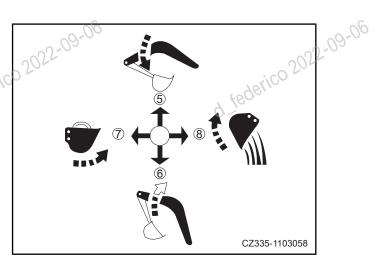


Fig.4-39

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- When walking, step the brake pedal to brake.
 While working to at the the end, the buckle will buckle the brake pedal, so the machine has been in a braking state
 - · Step the brake buckle and release the brake.

Note: In walking state, step the brake pedal and buckle to avoid pedal locked, Pedal d_federico29 locked while traveling is very dangerous.

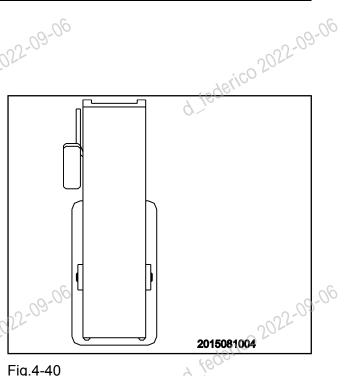


Fig.4-40

4.2.4.5 Accelerating pedal

Step the accelerator pedal, the machine begin to accelerate.

Note: Before stepping the pedal, check that the lower body is in the right direction. d.federico 2022-09-06

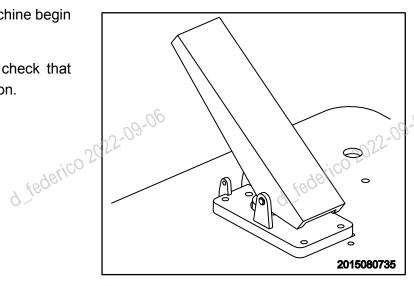


Fig.4-41

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4.2.5 The steering column switch and indicator

4.2.5.1 Summurize

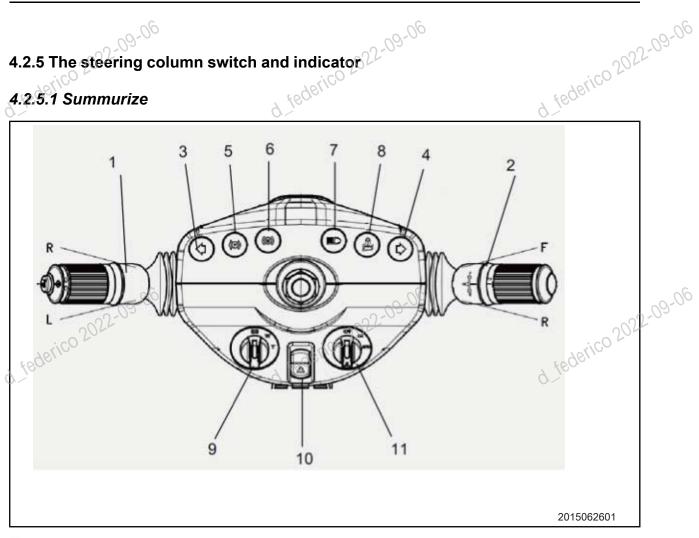


Fig.4-42

- [1] Combination switch (left joystick)
- [2] Walk combination switch (right joystick)
- (3) Left turn indicator
 - [4] Right turn indicator
 - [5] Parking brake indicator
 - [6] Operating mode indicator
 - [7] Long distance light

- Parking Brake / Job / Walk Mode Select button teder button
 - [10] Warning light switch
 - [11] Damping Lock manual / automatic selector switch.

4.2.5.2 Combination switch (left lever)

d.federico 2022-09-06 A . WIPER SWITCH Spin around the joystick to move the wiper

- O The wiper stops
- J Occasional wiper action
- I Wiper high-speed action

CAUTION

Glass dry or sand, oil attached etc. start the Wiper Blade will damage the glass or wipers

B. The wiper cleaning switch

The outer part of the left side of the joystick is the wiper cleaning switch. When the cleaning liquid is discharged, the spraying is stopped and the wiper moves back and forth three times.

A CAUTION

- Spray cleaning solution for more than 20 seconds or no cleaning solution when using the cleaning switch operation will damage the cleaning motor;
- The use of soapy water or a synthetic cleaning agent instead of the cleaning solution can damage the wiper motor or the wiper blade.
- C . Horn switch Press the button in the middle of the left side of the operation lever, and the horn will on.
- D. Light control lever Turn the light control lever to control the left and right turn signal lights in front and rear combination lights.
 - a .Right Turn: Push the joystick forward and the right turn indicator to one Fixed frequency flicker;
 - b. Left turn: Push the joystick backward and the left turn signal will flash at a certain frequency.

When the above operation is performed, the steering left / right turn indicator also blinks at the same frequency

The steering bar does not auto- return, so please turn it back manually after turning.

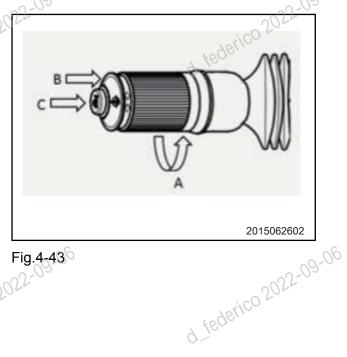


Fig.4-43

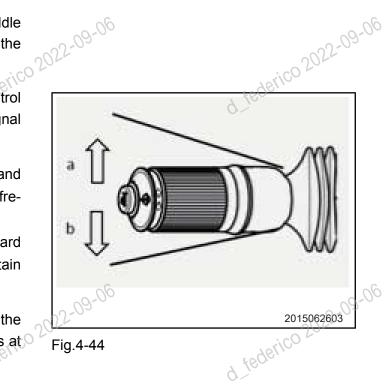


Fig.4-44



E. Headlights, distance light switch

- a. Distance light switching Operation lever up (can be automatically reset)
- · b . Short distance light on the lever is in the middle position
- c. Long distance light on Lever move down ward

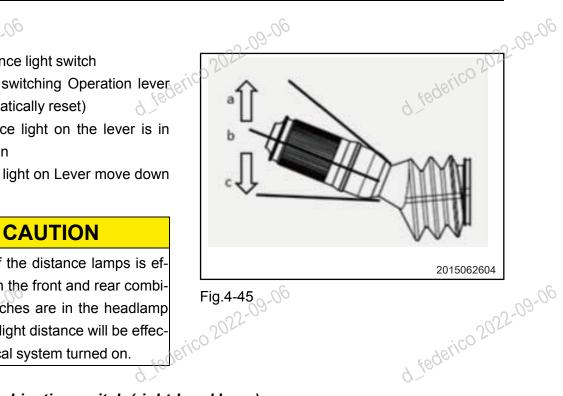


Fig.4-45

A CAUTION

· The operation of the distance lamps is effective only when the front and rear combination lamp switches are in the headlamp on position. The light distance will be effective while electrical system turned on.

4.2.5.3 Travel combination switch (right-hand lever)

- A. Forward, backward lever forward, backward lever can change the travel direction.
- a. Forward (F): The lever moves forward
- b. Idling (N): The lever is in the central position:
- c. Rear (R): The lever moves backward.

A CAUTION

• In order to prevent the wrong operation of the gears, the operating lever is with a lock function, in the forward or reverse gear, you need to lift up the joystick slightly before the shift action.

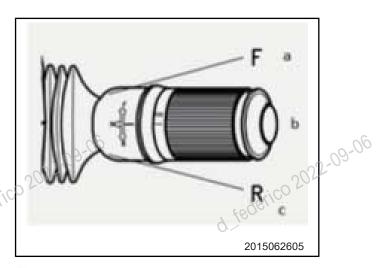


Fig.4-46

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2-09-06 B . Travel speed selection switch There are two speeds to choose from when walking the equipment. Rotating the joystick for speed selection

 Position I: Low speed Position II: High speed

C . Automatic cruise switch

- Enter into Auto Cruise Mode
- Press again to exit Auto Cruise
- · For automatic cruise entry and exit, refer to
- 3 Left Turn Indicator This indicator blinks at a certain frequency when turning Left 11 certain frequency when turning left. When the light bulb is disconnected, the indicator light will blink rapidly at an abnormal frequency. In this case, check the electrical circuit and replace the lamp in time.
- 4. Right Turn Indicator This indicator blinks at a certain frequency when you turn right. When the light bulb is disconnected, the indicator light will blink rapidly at an abnormal frequency. In this case, check the electrical cird federico 29 cuit and replace the lamp in time. d federico

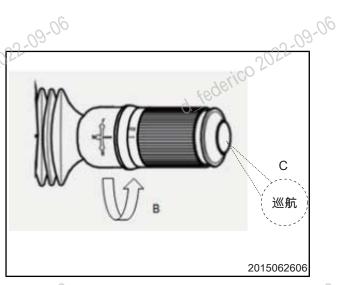


Fig.4-47

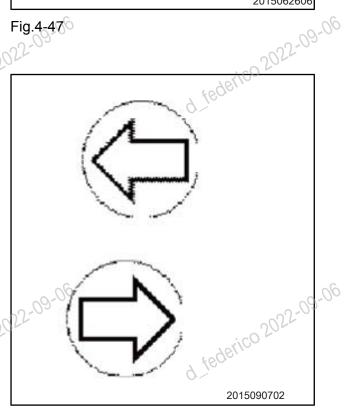
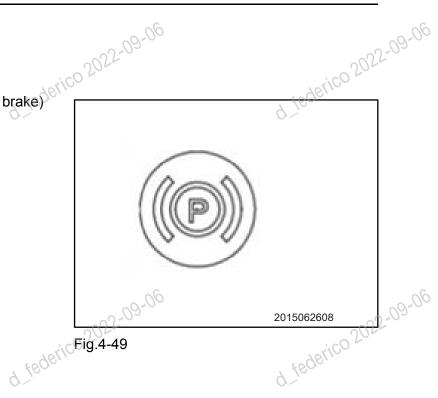


Fig.4-48



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This indicator lights when P (parking brake) mode is selected



federico 2022-09-06 4.2.5.5 Operating mode indicator

This indicator lights when W (Work) mode is selected

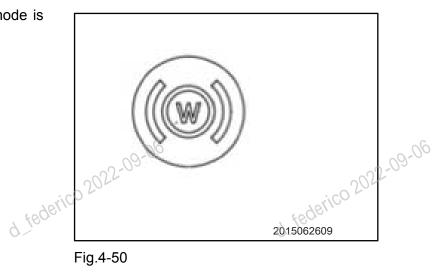


Fig.4-50

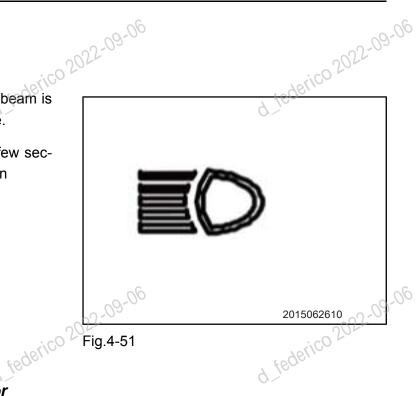
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This indicator will light when the high beam is on or the overtaking condition is active

onds to warn other vehicles of attention



d federico 2022-09-06 4.2.5.7 Damping lock on indicator

The lamp lights up when the shock absorber cylinder is actived.

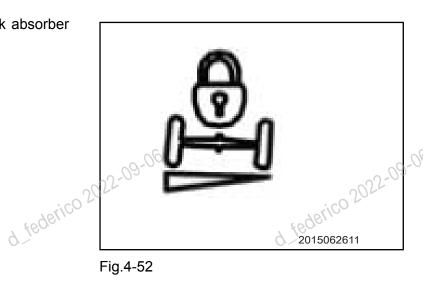


Fig.4-52

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4.2.5.8 Park / Work / Travel mode select button

The parking / Work / travel mode selection buttons have three positions, select the different modes, and display the corresponding job code on the display.

- position 1 is P (parking brake) mode: parking brake;
- Position 2 is W (work) mode: machine works;
- Position 3 is T (traveling) mode; machine travels;

Note: When the travel mode is selected, even if the hydraulic pilot joystick operated machines may not work.

When in the work mode, the excavator is able to walk, pay attention to the location of the working device, do not hurry to avoid accidents

4.2.5.9 Warning light switch

Warning lights are used when the excavator is stopped due to a fault. Press this switch, front and rear turn lights and left and right turn indicator light on the steering bar will flash at a certain frequency, to indicate to the people around.

The warning light is independent to the position of the ignition switch.

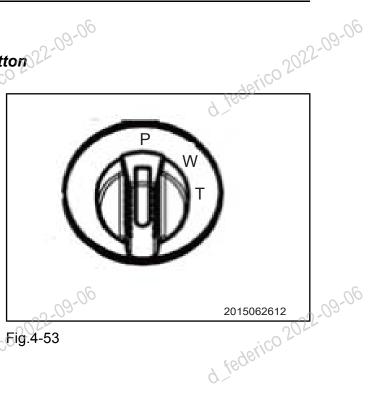
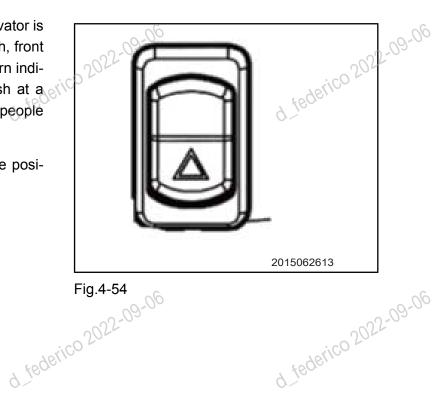


Fig.4-53





4.2.5.10 Damping cylinder lock switch

When the switch is in the "0FF" position, the damping cylinder is locked, the excavator stops running, the locking position is selected during the operation, and the shock absorbing cylinder is locked, thereby improving the stability during excavation.

When the switch is in the "ON" position, the shock absorber cylinder is activated, the shock absorber cylinder is activated while excavator traveling to buffer and absorb external shocks to ensure the smooth and comfortable traveling.

When the switch is in the "AUTO" position, the damping cylinder automatically activates or locks the cylinder according to the mode of operation.

| | Swing lock settings | Statues | |
|---------------------------------|---------------------|---|---------------|
| P (parking brake) mode | Locked | Consistently on | 50 2022-09-06 |
| ederico 2022 | Locked | Forward and backward joystick in middle; Brake pedal step on. | 302022 |
| W (Work) mode | | Forward and backward joystick in | |
| | Unlocked | forward or backward position | |
| | .09-06 | ,Brake pedal step off | 022-09-06 |
| traveling) mode | Unlocked | Consistently | 302022-09-06 |

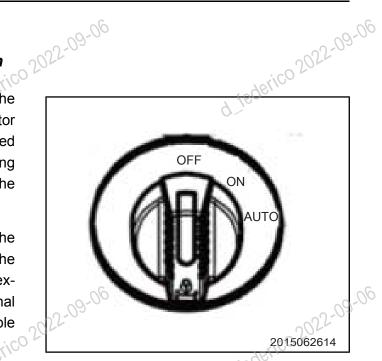


Fig.4-55



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4.2.6 Top window

WARNING

d federico 2022-09-06 · When leaving the driver's seat, the locking lever is firmly placed in the locking position, and if the safety locking lever is in the unlocked position and the wrong way of touching the joystick or pedal can lead to serious accident.

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Open up

1. Place the security lock in the "lock" position. d federico 2

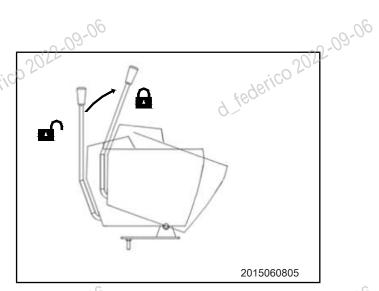
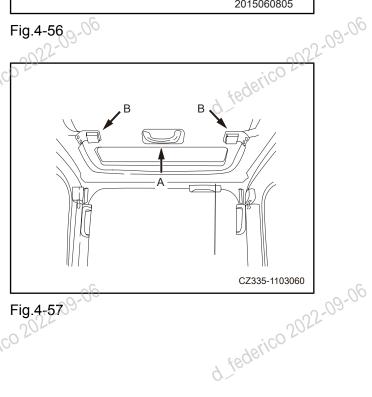


Fig.4-56

2-09-06 2. Push up the top window handle [A] on both sides of the lock [B], and then hold the handle [A] and push up the top window.



Close the top window

Hold the handle [A] pull down the top window, lock [B] automatic fastening. If the lock can μιορετίν engaged, then open the top window and try to lock the top window again.
4.2.7 windshield

- The front window can be kept (pull up) on the top of the cab.
- Before opening or closing the front window, stop the machine on the leveling ground, the working devices completely down to the ground, shut down the engine, and then operate.
- hands to hold the handle to pull up, before it automatically locked, don't let ao While opening the front window, to use both automatically locked, don't let go.
 - When the front window is closing, the window is quickly closing. Hold the handle with both hands tight.

WARNING

- While opening or closing the front window, the bottom window or door, the security lever should be placed in the lock position.
- to avoid the collision of the front window to hit the steering wheel. Before opening or closing the front win-
- If the safety locking lever is in the release position and the wrong way of touching the control lever or the control pedal will lead to serious accidents.

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- Open up 2022-09-06 1. Park the machine on a flat ground, drop the working device completely on the ground, and then turn off the engine.
- 2. Place the security lever in the "lock" position.

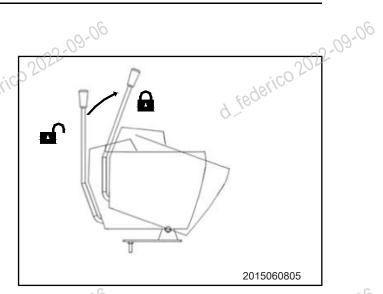
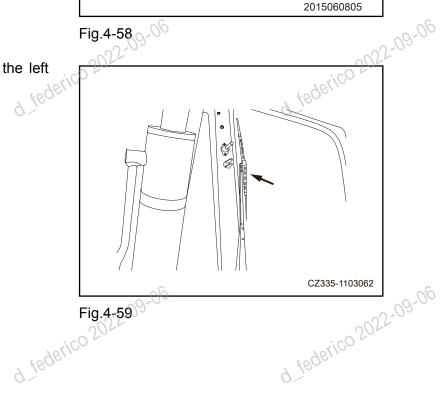


Fig.4-58

12-09-06 3. Check wiper blade and store it on the left d federic side support.

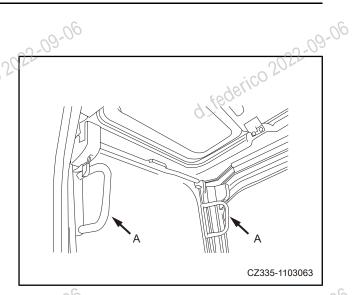


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2-09-06 4. Hold the front window at the upper left, right hand [A] on both sides and pull two handles [B] to loosen the lock in front window. The top lock will be torn off.



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Fig.4-60 d federico 29 d_federico 2022-09-06 CZ335-1103064

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Fig.4-676

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5. In the cab, grasp the bottom handle [C] with your left hand and the top handle [D] with your right hand and pull it up. And push it toward the rear of the cab in the direction of the latch [E] to securely lock the front window.

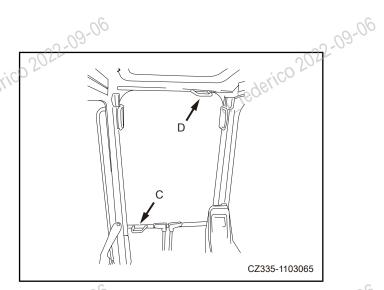


Fig.4-62

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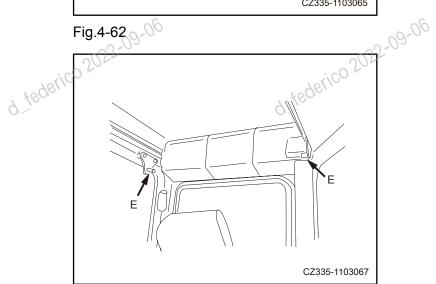
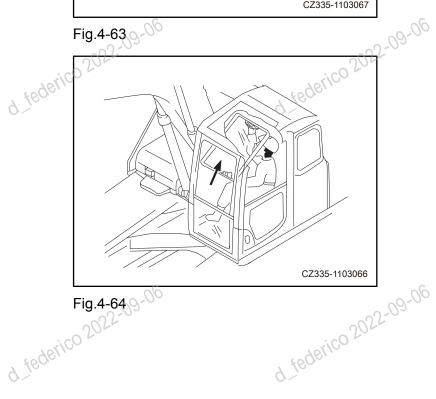


Fig.4-63

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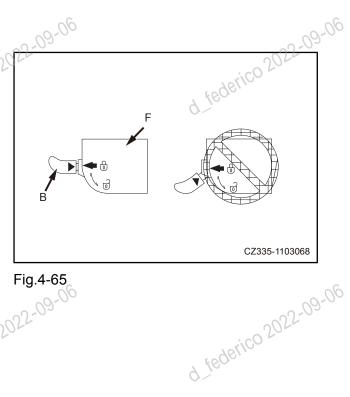


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Fig.4-649

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- 6. Check that handle [B] is firmly in the "locked" position.
- Check that the arrow on the lock shell [F] is aligned with the arrow on the handle [B] and the lock is engaged.
 - If the arrow on the lock shell [F] does not align with the arrow on the handle [B], the lock is not engaged. Repeat step 5 to engage the lock



rico 2022-09-06 Fig.4-65

Closing 22-09-06

CAUTION

- When closing the front window, slowly lower it, taking care not to get stuck..
- 1. Put the machine on a flat ground, lower the working device to the floor, and then turn off the engine.
- 2. Set the safety lock lever to the "Locked" d.federico 2022-09-06

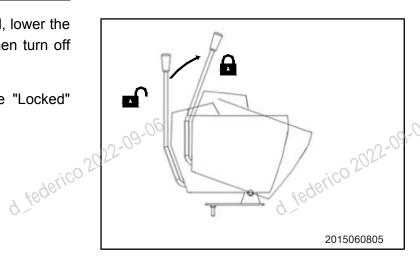


Fig.4-66

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3-09-06 3. Grasp the left and right handles [A] and pull down the handle [B] to release the lock.

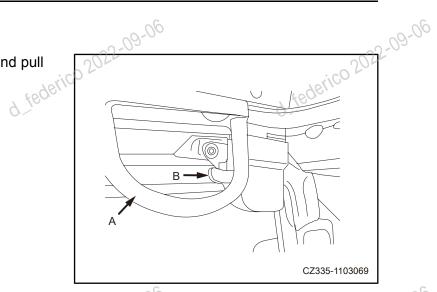


Fig.4-67

4. Grasp the handle [C] at the bottom of the front window with your left hand, grasp the handle [D] at the top of the front window with your right hand, push it forward, and slowly lower it.

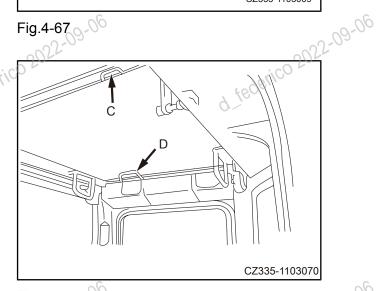


Fig.4-68

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5. When the bottom of the front window reaches the top of the bottom window, push the top of the front window forward to push it toward the left and right side lock [G] to engage the lock.

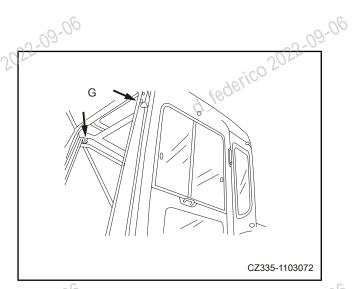


Fig.4-70

- 6. Check that handle [B] is firmly in the"locked" position.
- · Check that the arrow on the lock shell [F] is aligned with the arrow on the handle [B] and the lock is engaged.
- If the arrow on the lock shell [F] does not align with the arrow on the handle [B], the lock is not engaged. Repeat step 5 to engage the lock.

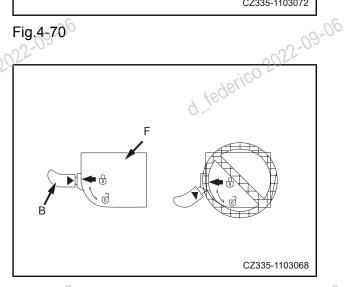
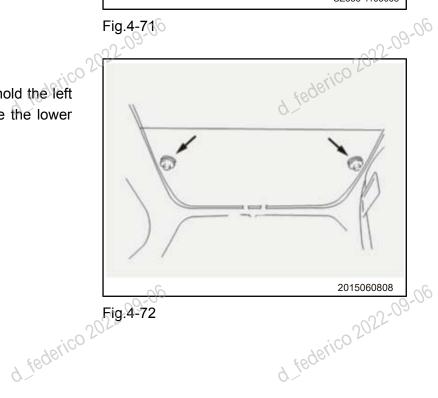


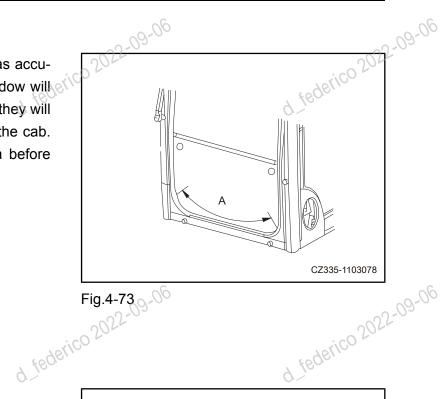
Fig.4-71

Remove the lower windshield

Open the front window, and then hold the left and right handles, pull up, remove the lower part of the windshield.



 If the bottom of the front window has accumulated sand or dust, the front window will o not be easy to remove. In addition, they will stick to the glass and brought into the cab. To prevent this, clean the [A] area before disassembling.



2022-09-06 4.2.8 Cab windows and doors

Open up

- 1. Press the lock when opening the cab door window.
- 2. Slide the front window backwards and / or forward the rear window.

Closing

- 1. Slide the front window forward and (or) rear window backwards.
- 2. Close the door and window to ensure that the lock is completely locked.

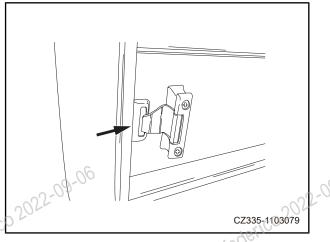


Fig.4-74

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To rest the cup (pot), in the cab a cup holder is facilitated.

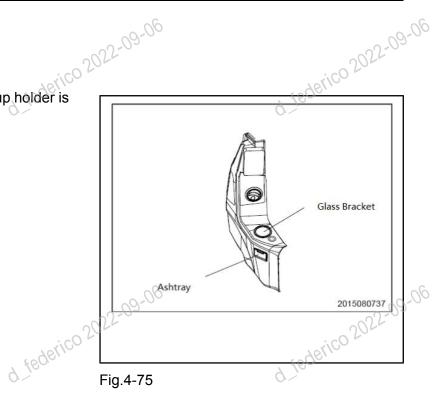


Fig.4-75

4.2.10 Ash tray

d federico 2022-09-06

- This storage is located on the left side of the cup holder.
- · Before putting cigarettes in the ashtray, be federico 2022-09-06 sure to turn off the cigarette then put the cover closed.

4.2.11 Information kits

- The kit is located on the back of the driver's seat back. The figure on the right shows the effect when the seat back is fully lowered.
- You can store the Operation and Maintenance Manual in this bag so that you can take it out when necessary.

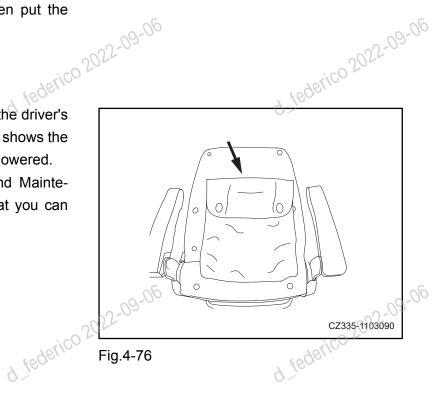
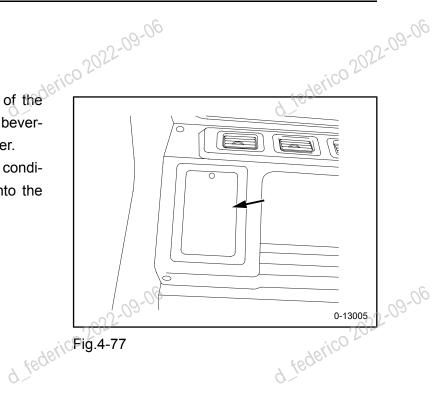


Fig.4-76

- The box is located on the left side of the rear of the driver's seat. It keeps the hage warm in winter
- Depending on the setting of the air conditioner, hot air or cool air is blown into the box.



d federico 2022-09-06 4.2.13 Emergency exit

Under Emergency situation, if the cab windows and doors can not be opened, the rear window can be treated as an emergency exit.

 For cabs fitted with safety hammers, a safety hammer can be used to crush the rear window glass. The safety hammer is located on the left side of the cab rear window. d federico

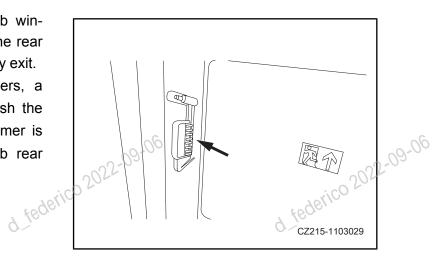


Fig.4-78

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72-09-06 T o the pull-ring rear window, you can pull the ring, from the rubber on the window frame to pull the rubber core out, and then push the glass corner hardly, the glass will be unloaded.

NOTE:

Only in emergencies can the rear window be used as an escape exit, do not use it at any other time.

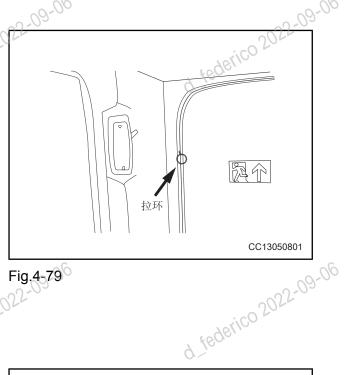


Fig.4-79

4.2.14 Fire extinguishers

CAUTION

- Be sure to have a fire extinguisher and read the label, master the use of emergency methods.
- Periodic inspections are required to ensure that the extinguishers are in good condition.
- If the fire extinguisher has expired, must be promptly replaced.

A fire extinguisher is provided in the rear of the cab.

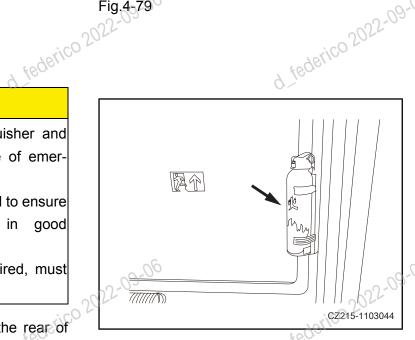


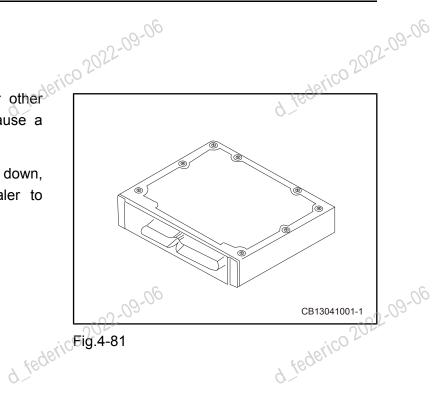
Fig.4-80



d. federico 2022-09-06

Be careful not to get water, mud or other liquids on the controller. This can cause malfunction.

If the controller fails, do not break down, please contact Sany authorized dealer to repair.



d_federico 2022-09-06 4.2.16 Fuse piece

When the start switch is turned to the [ON] position, if the starter motor does not start, there is a possibility that the fuse is disconnected. Open the fuse cover located behind the seat and check and replace it.

NOTE:

- Fuses (pictured) refer to fuses mounted on the circuit to prevent electrical parts and wires from burning out.
- Fuse with 5A, 10A, 15A, 20A four specifications to distinguish between different colors. Replace with the same capacity of the fuse.
- Be sure to turn off the start switch before replacing the fuse.

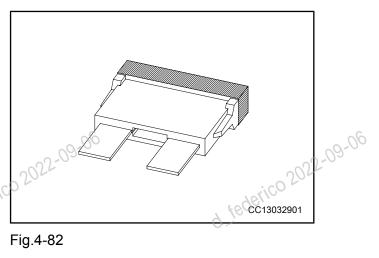


Fig.4-82

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4.2.17 Air Conditioning System

4.2.17.1 Control panel

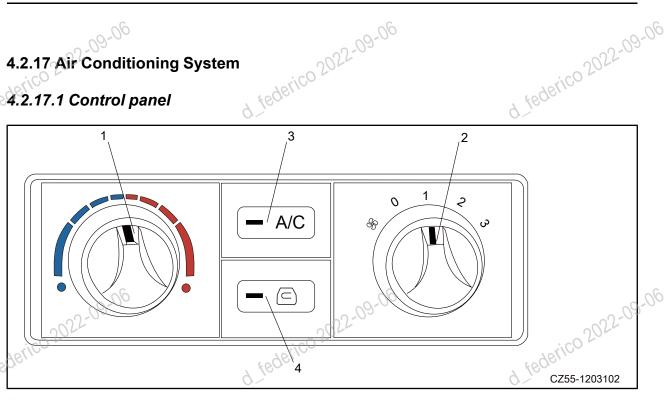


Fig.4-83

- [1] Temperature adjustment switch
- [2] Air volume adjustment switch
- [3] Compressor power switch
- [4] Internal and external circulation switch
- [1] Temperature adjustment switch

Preset the required temperature

30 °C; middle position = 22 ~ 24 °C; left cooling, the maximum

[2] Air volume adjustment switch

In the cooling or heating mode, adjust the fan air volume

(1,2,3 position gradually turning large).

0 position is the OFF key of the air condition.

[3] Compressor power switch Turns the compressor clutch on or off. d federico

On: The indicator light is on.

Off: The indicator is off.

[4] Internal and external circulation



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switch The switch that switches

the internal or external air

circulation. Internal air: light on

External air: the gas: light off

Operation method

A CAUTION

- The air conditioning system must be started after the engine is started. After the
- In the spring, autumn or winter, air-conditioning refrigeration is not that necessary 5 minutes or so to prevent rusty parts within the system due to long-term not used.
- Due to the heating system and the water tank connected, when the environment temperature is lower than -35 °C, and long time off stop using, the tank should be filled with water to prevent the heater pipe frozen

1.Start the engine

- 2. Turn the air volume adjustment switch to the right to position 1 or 2, and start the air conditioner to supply air to the vehicle.
- 3. When running on cooling mode, turn on the compressor power switch (indicator light), turn the thermostat switch to the proper position (left up to 15°C); When on the heating mode, turn off the compressor power switch (indicator light off) Adjust the switch to the right to the
- 4. To turn off the air conditioner, turn the air volume control switch directly to 0 == volume control switch directly to 0 position.





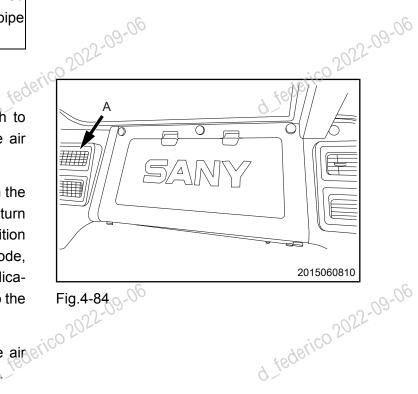


Fig.4-84

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In the cooling state, if the temperature inside the vehicle reaches the preset temperature inside the clutch name. NOTE 222-09-06 the vehicle reaches the preset temperature, the clutch power of the compressor will be automatically on / off (but the indicator light remains on) to keep the temperature inside the vehicle.

[A] : Rear air outlet (4 locations)

[B]: Defrosting outlet (1 place)

d federico 2022-09-01 【C】: Facial air outlet (1)

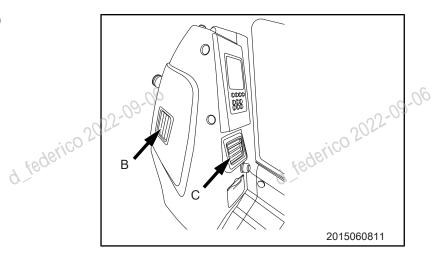
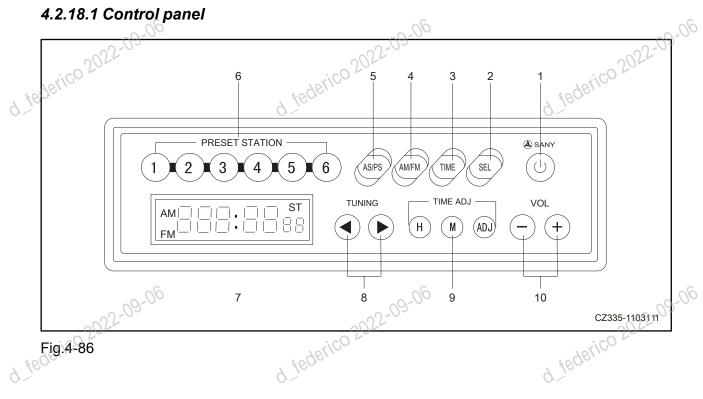


Fig.4-85

4.2.18 Radio

4.2.18.1 Control panel





d_federico 2022-09-06 [6] Radio preset radio button (1~6) [1] Power switch LCD display [2] Sound mode button [8] Tuning buttons 3 Time display button [9] Time adjustment button [4] FM / AM Switch button [10] Volume adjustment button [5] AS/PS switch

4.2.18.2 Control buttons and liquid crystal display

[1] Power switch

lederico 2022-09-06 Press power switch , to ©turn on the radio. Channel will be displayed on 【7】, press this button federico 2022-09again to turn off the power.

[2] Sound mode button

Press Sound mode button , every time, sound modes display in turn as : VOL (Volume) →-BAS (Bass) →TRE (Treble) →BAL (Balance).

5 seconds without any operation to return to the

frequency display interface, Sound status displays [7] on the display

[3] Time display button

When displays frequency, press the time display button , the display will show the current time for 5 seconds. After 5 seconds, the display automatically reverts to the frequency display.

Press and hold the button [3] for more than 5 seconds to display the country area: asa: eu (asia: europe).

(4) FM/AM selector

Press the FM/AM button to switch between FM and AM.

[5] AS/PS button

The AS/PS button is used for automatic scanning of saved radio stations and automatic searching of radio stations.

AutomaĀc scanning:

Turn on the radio and press the AS/PS button. The radio starts automatic scanning of the previously saved radio stations. Each of the preset stations is tuned in for 10 seconds, with the number of the radio station displayed on the LCD.

To tune in one of the save stations, press the AS/PS button.

AutomaĀc searching of radio staĀons:

.02022-09-06 .02022-09-06 Turn on the radio and press the AS/PS button for 2 seconds. The radio starts an automatic searching of radio stations within the present wave band. The first 6 radio stations with good reception are saved in the radio memory.

[6] Preset stations

- Press any of the 6 preset station buttons to tune in one of the preset station.
- This funcĀon is available only when there are saved radio staĀons in the radio memory.

[7] LCD display

d_federico 2022-09-06 Wave band, radio frequency, preset numbers and time are displayed on the LCD display.

[8] TUNING buttons

Press[®] and[®] to decrease and increase radio frequency on the LCD display.

(9) TIME ADJ (time adjustment) buttons

Radio time is reset using the time adjustment buttons: H, M and ADJ.

H: Hour adjustment

M: Minute adjustment

ADJ: Set to zero

[10] VOL (volume control)

- federico 2022-09-06 • VOL buĀons⊕ and⊝ are used to control radio volume.
 - Press to raise radio volume up to 40.
 - Press⊖ to lower radio volume up to 0.
 - The LCD returns to frequency display when no opera\(\bar{A}\)on is done within 5 seconds.

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4.2.18.3 Radio operation

Use the Preset key

- 1. Press the power switch [1]. In this case, the frequency will be displayed on the display.
- 2. Use the UP / DOWN search key [8] to adjust to the desired frequency. There are two tuning methods: auto tune and manual tuning.
- 3. When the desired frequency appears on the display [7], press and hold the desired preset number for at least 1.5 seconds and the echo sound stops. However, when the preset operation (stored to memory) is complete, the sound reappears and the preset number and frequency appear on the display to indicate that the preset operation has been completed. When the preset is completed, press the radio preset radio button [6] and release it within 1.5 seconds so that the preset channel can be

You can use the auto save key to store the preset key.

Search the

- 1. Press the power switch [1]. In this case, the frequency will be displayed on the display [7].
- 2. Use the Tuning key [8] to adjust to the desired frequency. There are two tuning methods: auto tune and manual tuning.
- until the frequency is displayed on the display [7]
 When the frequency reaches " Manual tuning Press the tuning button [8] play [7]

tom frequency, it automatically

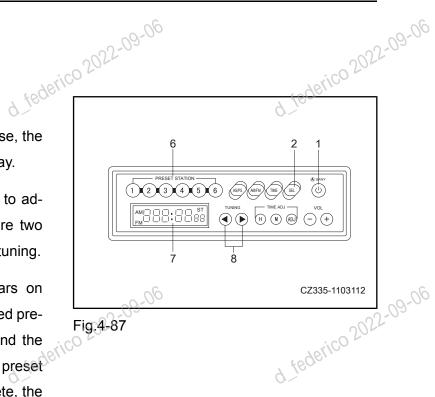


Fig.4-87





accordance with the top \rightarrow bo \bar{A} om or bo \bar{A} om \rightarrow top to conĀnue.

Auto tune Press and hold the Tuning button [8] to automatically search the radio channel up or down. When a channel is received, the tuning stops automatically. To search for the next channel, press and hold the tuning button [8]. If you press this button during auto tuning, auto tuning will be canceled and the setting will return to the frequency used before pressing this button.

- VOL buttons [10] are used to control radio volume. volume.
 - Press to raise radio volume up to 40.
 - Press to lower radio volume up to 0. Sound effect adjustment
 - BAS: Press the SEL button and select BAS. Within 5 seconds, press or to adjust BAS value between +7 and -7.
 - TRE: Press the SEL button and select TRE. Within 5 seconds, press or to adjust TRE value between +7 and -7.
 - BAL: Press the SEL button and select BAL. Within 5 seconds, press or to adjust BAL value between L9 and R9. BAL.0 means that the left and right sound track are balanced.

NOTE:

Sound effect mode returns to show previous setting if no operation is done within 5

seconds. d.federico 2022-09-06 d federico 2022-09-06 d_federico 2022-09-06

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Radio time adjustment

- 1. Press the TIME button [3] to display radio time on the LCD. The display will return to radio frequency after 5 seconds.
- 2. When radio time is displayed on the LCD, press H or M to select Hour or Minute.

H: Hour adjustment

(Hour goes up by 1 with each press)

M : Minute adjustment

(Minute goes up by 1 with each press)

lederico 2022-09-06 Keep H or M pressed, Hour or Minute will keep going till the button is released.

ADJ is used for precision adjustment:

- When it displays like 00-05, the time setting returns to 00 minutes, 00 seconds. (No changes on hour)
- When it displays like 55-59, the time setting advances to 00 minutes, 00 seconds. (Hour advances too).
- When it displays like 06-54, the time can not be reset. (Time remains the same)

Antenna

Before transferring the machine to the inside of the building, retract the antenna to prevent any interference. Retract the antenna as follows:

- 1. Loosen the mounting bolt [1] of the antenna and retract the antenna in position [A].
- 2. After retracting the antenna, tighten the bolt [1].

Use the radio with care

- To ensure safety, keep the volume at a level at which external sound can be heard during operation.
- If the speaker box or radio penetrated by water, will lead to unexpected failures, so be careful not to get water on the device.

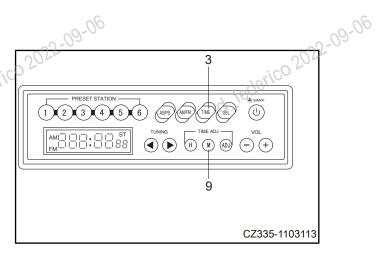


Fig.4-88

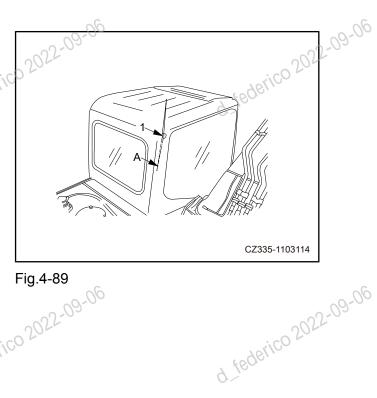


Fig.4-89 Jerico 2022-09-06



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- Do not clean the control panel or keys with benzene, thinner, or other solvents. Use a soft, dry cloth. If the device is dirty, clean it with alcohol.
 - When the battery is disconnected or replaced, the preset key settings and the clock are cleared, so you'll have to recalibrate all settings.

4.2.19 Door locks

A CAUTION

- Before releasing the lock, park the machine on a level surface
- Do not release the door lock on the slope, the door may suddenly close, causing injury.
- Do not put your body or hands outside of the machine until you release the lock. Do not put your hands on the door frame. The door may close suddenly and cause injury.
- 1. Push the cab door in the direction of the latch [1] to lock it.
- 2. To close the door, press the handle [2] on the left side of the driver's seat to release the latch [1].

When the door is opened, securely lock the door to the latch [1].



Fig.4-90



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4.2.20 Lockable cover

4.2.20.1 Summurize

Open / close the lock on the cover and cover cloth with the start kev.

For details on the locked cover and cover cloth, see "Locking" on page 4-98.

Insert the key and insert the key into the shoulder [A].

NOTE:

Turning the key when the key is not inserted into the bottom may cause a break.

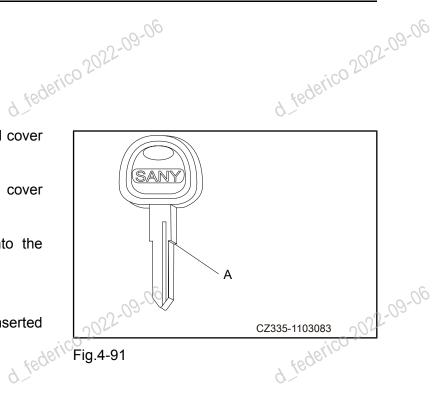


Fig.4-91

4.2.20.2 Open and close the cover with the lock

CAUTION

- After removing the key, be sure to rotate cover [1] to cover the key port. Otherwise, the lid lock will not be smooth/failure to opened due to the entry of foreign matters.
- Jerico 2022-09-06 Lock cover tightened when the trip is far, be sure to lock the lid by screwing in place and then turn the key to lock the cover; To turn the key before cover cloth tightened, the clutch hits inside wall of the fuel inlet. can result lock core damages.
- Be sure that the lock lid seal clean, if it contaminated by iron, gravel and other debris, the tighten process leads the seal damages, resulting in seam locking seal.

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Open the cover

- Unscrew the key cover [1].
 - 2. Insert the key into the key slot.
 - 3. Turn the key clockwise to align the key slot with the mark [A] on the cover, then open the cover [2].

Position [A]:Open

Position [B]: Locked

Lock the cover

- 1. Tighten the cover [2] and insert the key into the key slot.
 - 2. Turn the start switch key to the "lock" position [B], then pull out the key.
 - 3. Screw the cover [1] to over the keyhole. Pic 4-98

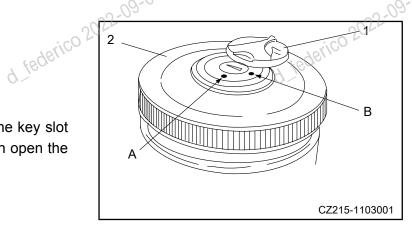


Fig.4-92

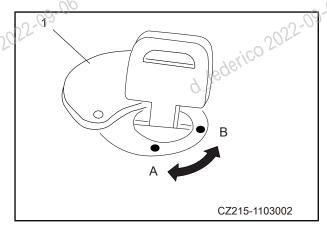


Fig.4-93

4.2.20.3 Open and close the lock cover

Open the cover (locked cover)

- 1. Insert the key into the key slot.
- 2. Turn the key counterclockwise and open the cover by the handle of the pull cover.

Position [A]: Open

Position [B]: Locked

Lock the cover

- 1. Close the cover and insert the key into the 2. Turn the key clockwise and pull out the Key.

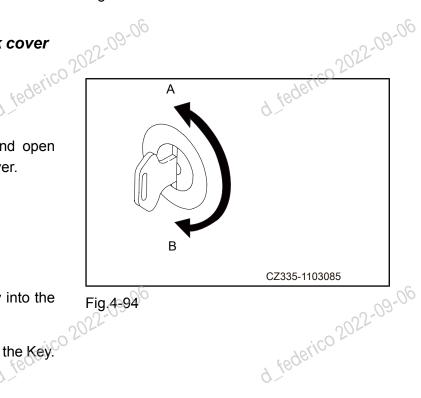


Fig.4-94



4.3 Operation and control of the machine d federico 21

4.3.1 Before start the engine

4.3.1.1 Inspection

Before starting the engine, inspect the underbody of the machine and the main machine. Check for loose bolts or nuts, oil, fuel, or coolant leakages, and check the working device and hydraulic system. In addition, check if the wire near the high temperature area is loose, whether there is clearance and dust accumulation.

A CAUTION

- Clean the flammable material around the battery, engine, muffler, turbocharger, or other hightemperature parts otherwise could cause a fire.
- Leakage of fuel or oil can cause the machine to catch fire.

The following checks and cleaning should be carried out before starting the engine every day:

- 1. Check whether the working device, cylinder, hose and so on cracks, excessively wears or looses, check the bucket and the O-ring on the connection of bucket, if any problems, be sure to repair or replace the failure parts.
- 2. Remove dirt and debris from the engine, battery, and radiator. Check the engine and radiator around whether the dirt accumulated. Also check the batteries, engine silencers, turbochargers, or other high temperature parts for the combustibles (dry leaves, twigs, etc.). If dirt or flammable subtederico 2022-09-06 stances are found, clean them. For cleaning the dirt from the radiator, see "Cleaning and inspecting the radiator and cooler plate" on page 5-44.
- 3. Check for leakages of coolant and oil around the engine. Inspect the engine for oil leaks and the cooling system for coolant leaks. If a problem is found, repair it.
- 4. Check if hydraulic device, hydraulic oil tank, hose, joints leak. If it so, replace it.
- 5. Check whether the body cracking, excessive wear and tear, loose bolts, tire wear is serious. If problems are found, repair or replace the parts. Tighten the loose bolts.
- 6. Check if handrail, stops are broken and if bolts are loose. Repair them immediately when problems are found. Tighten the loose bolts.
- 7. Check on panel and monitor. Check on panels and monitors inside the cabin. If any problem is found, replace the parts. Remove dirt on the surface.
- 8. Clean and check on rear mirror. Check if rear mirror is damaged. If so, repair them. Clean the mirror and adjust its angle so that operator can have clear view of rear area.



- 9. Check safety belt and buckles. Check if safety belt and buckles are damaged. If so, replace them
- 10. Check buckets with hooks. Check if hooks, hook seats buckets are damaged. If so, please contact an authorized dealer of Sany Heavy Machinery to repair them.

4.3.1.2 Check before the start of the engine

The following items must be inspected before starting the engine for daily work.

displace water and sediments

- 1. take bottom plate away from fuel tank
- 2. put a container under the displacement valve [1] to contain the displaced fuel
 - 3. Turn the displacement valve [2] to position of [O] (open) and let out all sediments and water together with fuel
 - 4. When clean fuel starts to run out, the displacement valve [2] to the position of [S] (shut down)

Check water and sediments in oil- water separator and displace water separator and displace water

- 1. open the door on right side of machine
- 2. Observe through transparent cover [1] and judge water level and sediments amount. If the water or sediments found on bottom of separator, put a container under hose [3] for the displaced water.
- d federico 20 Fig. 4-96 3. Loosen displacement valve [2] to displace water

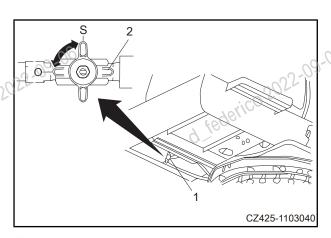
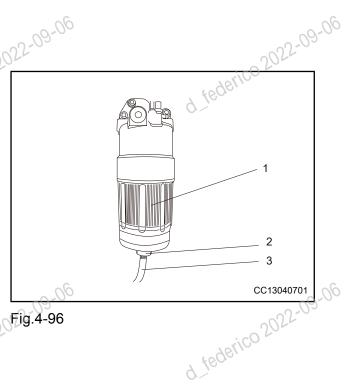


Fig.4-95





diately fuel runs out of displacement hose

NOTE: 7 (31).

- If transparent cover [2] looks dirty and inside is hard to be seen, it needs to be cleaned after replacing the filter.
- Grease O ring [4] and tighten it to the bottom when displacement valve [3] has been removed during cleaning

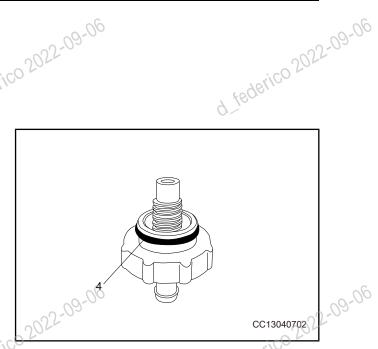
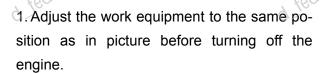


Fig.4-97

d federico 2022-09-06 check hydraulic oil level inside tank

A CAUTION

- · Parts and oil can still be hot after turning off of engine. Cool them down before starting touching or inspecting them in case of being scalded.
- Turn the cover of oil filling opening slow to relieve internal pressure first before taking it off.



- 2. Within 15 seconds after turning off the engine, push work equipment lever and travel lever to the full extent and in all-round directions to release internal pressure.
- 3. Open the door on right side of machine and ate should be 10~30°C or 50~86°F and L +12.5~L +32.5. Hot oil temperate should be

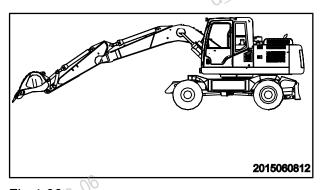


Fig.4-98

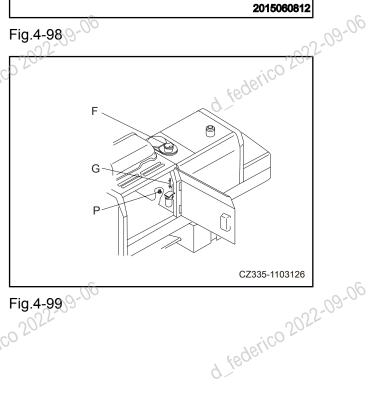


Fig.4-99

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55~80°C or 131~176°F. Hot oil should be higher than mid-level index.

4. If oil level is bolovel in

- 4. If oil level is below L line, then fill in through the opening **[F]** on top of oil tank.
- recommendation : Caltex AW HDZ46 (B420106000036)
- hydraulic oil tank capacity: 150 L

NOTE:

Do not fill oil above H line. If so hydraulic device will be damaged and oil might eject. If oil level is H line, close the engine, wait for oil to cool down. Put a utensil under the screw plug [P] and let out the extra oil.

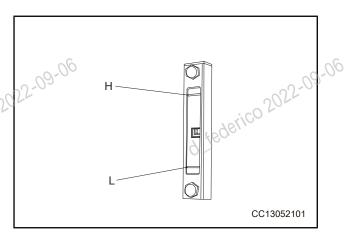


Fig.4-100

Check coolant level

CAUTION

- After turning off the engine, coolant is still hot and interior pressure of radiator is high.
 Do not open up pressure cover of expansion tank [2] before coolant is still hot, otherwise you may be scalded. Remove the expansion tank cover [2] slowly after the coolant cools down to release interior pressure.
- 1. When the engine is working, coolant level must between the upper and lower limit level marks. If cold water is below the lower limit level, more coolant needs to be added into radiator and expansion tank.

 2. Open up and
- 2. Open up engine hood and check if coolant inside expansion tank [1] is between the

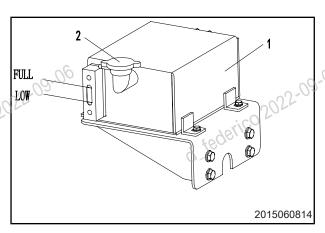


Fig.4-101



level of FULL and LOW. If its level is below LOW, instill more coolant through expansion tank filling opening to the level of FULL.

- 3. Tighten up the cover after the coolant is filled
- 4. If expansion tank [1] is empty, the coolant might be leaking. Inspect and fix immediately if there is leaking. If not, instill coolant into expansion tank [1].
- 5. If water level is hard to read inside expansion tank [1], please refer to page 5-6 "replace engine coolant and clean interior of cooling system".

Check oil level inside engine oil pan

A CAUTION

- Parts and oil can still be hot after turning off engine and may cause scald. Operate after they cool down.
- 1. Open up engine hood
- 2. Take out oil ruler **[G]** and clean the oil on it with clean cloth.
- 3. Insert the oil ruler 【G】 fully and then take the oil ruler out.

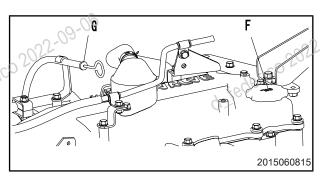


Fig.4-102

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4. The oil level should be between H and L of oil ruler 【G】. If oil level is lower than L, fill in more oil through opening 【F】.

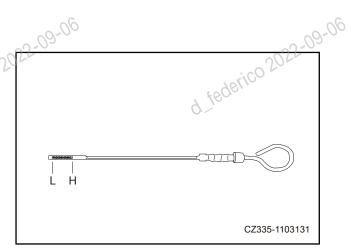


Fig.4-103

- 5. If oil level is above H, the emission valve on bottom of oil pan [P] needs to be opened up and letting out more oil until the oil reaches ideal level.
 - 6. If oil level is proper, screw up cover of oil filing opening and shut down engine hood.



- If you are checking oil level after using the engine, then the checking should be 15 minutes after turning off of engine.
- machine horizontal Keep during the ico 2022-09-06 inspection.

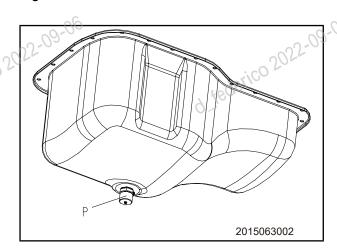


Fig.4-104

Check electrical wires

CAUTION

- If the fuse is frequently burnt or short circuit is found, please contact authorized dealer of Sany Heavy Machinery immediately for trouble shooting and repair.
- Keep the battery cover clean, and check the air vents on cover of battery. If the vent is blocked by dirt or dusts, clean the battery cover to keep the vent unblocked.

right, if the circuit is short or open and if the cladding is damaged. cladding is damaged.

Check if the terminal is loose, if it is, screw them up.



and alternator, pay special attention to their electrical wires. Check if three are inflormation bles around botton immediately.

Check fuel level

A CAUTION

- When injecting fuel, do not let them spill over, otherwise it is likely to cause fire disaster.
- If the fuel is spilt, clean them thoroughly, if
 the fuel is on the ground or send " move them or clean them thoroughly.
- 1. Turn the engine 【ON】 and check fuel level on the meter. After checking, switch it back to **[OFF]** position.
- 2. If fuel level is low, remove the oil filling opening [F], and fill in fuel until the float of float level meter [G] reaches the top.
- distance between float level meter 【G】 to top of 【a】: 50mm
- when fuel level is lower than 10%, there will be alarm on display.

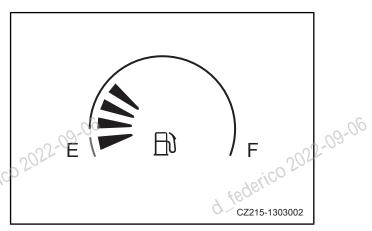


Fig.4-105

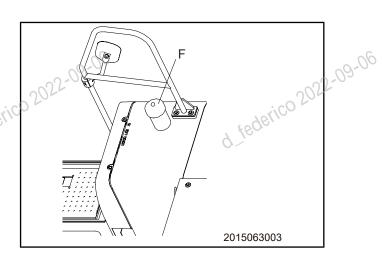


Fig.4-106

d federico 2022-09-06

d. federico 2022-09-06



3. when filling the fuel, press filling cover IF downward straightly. Be careful lest the float meter [G] is stuck on the protruding [F] .Tighten up the cover [F]

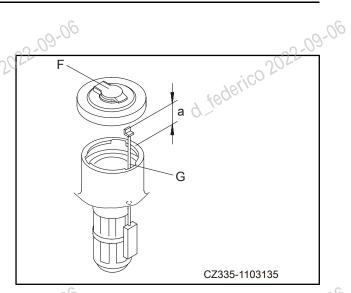


Fig.4-107

- NOTE: 22-09-06 If the vent hole of the cover is blocked, then pressure inside fuel tank will be lessened and fuel will stop flowing. Therefore vent hole must be cleaned regularly.
- When tightening the locker cover, the stroke is long. Make sure locker cover is fully moved before switching the key to lock it up. If the cover is not fully moved, moving the key can cause damage to locker cylinder.
- The seal of locker cover must be kept clean. be damaged and seal will not be shut tightly.

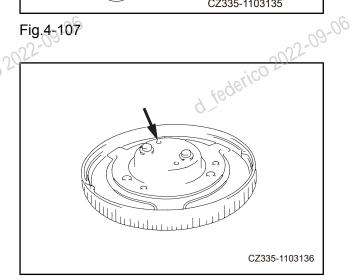


Fig.4-108

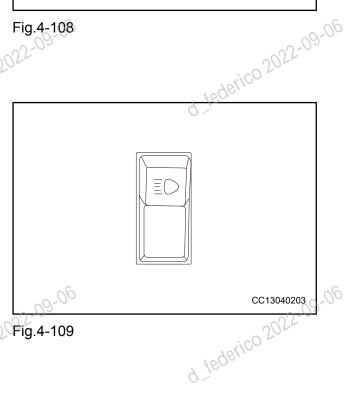
Check work lamp switch

Check if work lamp can work normally.

Check if it is damage or polluted.

If the lamp is not working, the bulb might be broken or there is opening of circuit. If so, contact an authorized dealer of Sany heavy machinery for repair.

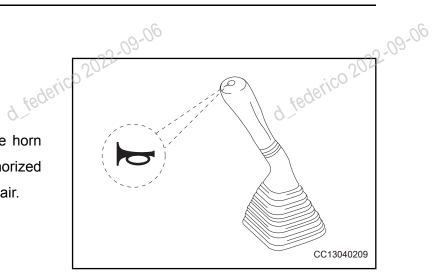
- 1. Turn the switch to 【ON】.
- 2. Turn on the work lamp and check if the bulb Fig.4-109 d feder is working.





Check the horn

- 1. Turn the switch to 【ON】.
- 2. Press the horn button to check if the horn works normally. If not, contact an authorized dealer of Sany Heavy Machinery for repair.



4.3.1.3 Adjustment before operation

Operator seat

Adjust the operator seat before opera ration or operation shifts, so that the operator feels comfortable and can move the joystick, steps and switch freely.

(A) vertical adjustment

lift up lever [1] to the right position during adjustment.

Adjustment scale: 200mm (10mm for each level)

(B) horizontal adjustment of whole seat

Pull the lever [2] up to proper position. In this case, operator seat and left right armrests will move together with pilot lock lever.

[C] adjust suspension (if equipped)

Turn lever [3] to left, the suspension will be hardened, it will suit heavy operator. Turn the level [3] to right, then suspension will be-

the best match is when readings on meter [4] equals with weight (kg) of operator

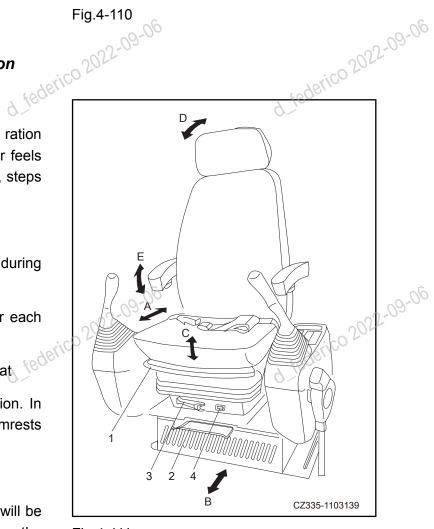


Fig.4-111

[D] adjustment of back rest

Pull lever [5] up , put the back rest to the ideal position where you can operate easily and then loose the lever.

NOTE ·

when adjusting back rest angle, watch out no intervention between back rest and air-con hood and be careful lest the armrest touches the joysticks.

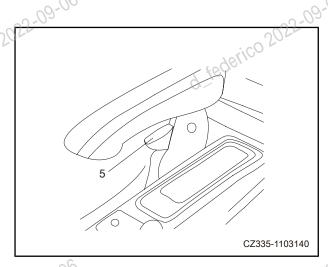


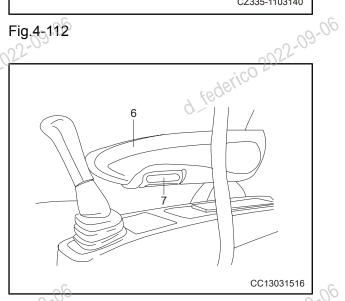
Fig.4-112

[E] adjust armrest angle

Adjust the turning disc [7] on bottom of armrest [6] until the angle of armrest be ideal for operator.

The armrest can be lifted vertical so that it's easy for operator to leave the seat.

Armrest adjustment scale: 40°

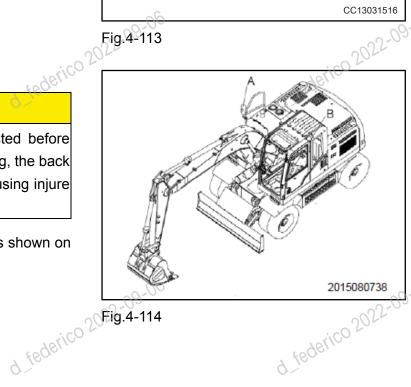


Rear mirror

CAUTION

 The rear mirror must be adjusted before operation. If the position is wrong, the back view might be hindered and causing injure to yourself and other people.

Installation position of rear mirror is shown on right side picture. d.federico 2022-09-06





- ture 4-122.
- Turn pole [1] to a proper place around [4] and then fasten pole [1].
- During the adjustment, if the mirror cannot be moving smoothly, the screw [2] and [3] can be loosed a bit.

Tightening torque of screw [2]: 4.0~5.4 N·m (0.41~0.55kgf·m)

 When adjusting angle of rear mirror, bench mark should be showing of machine side, as is shown on the right picture.

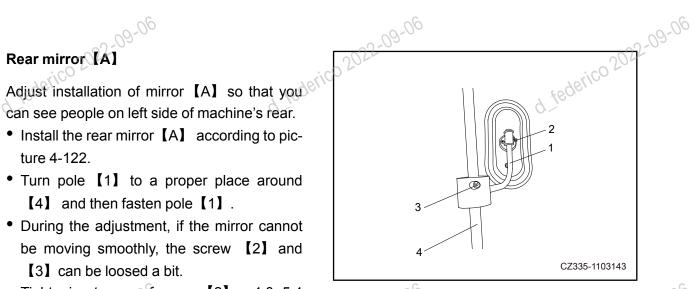
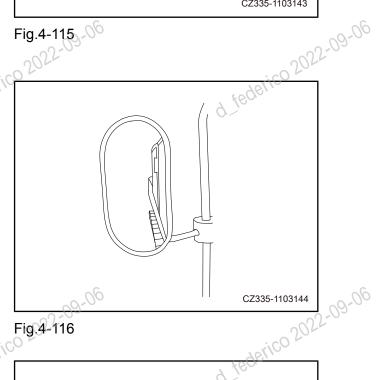


Fig.4-115



rico 2022-09-06 Rear mirror [B]

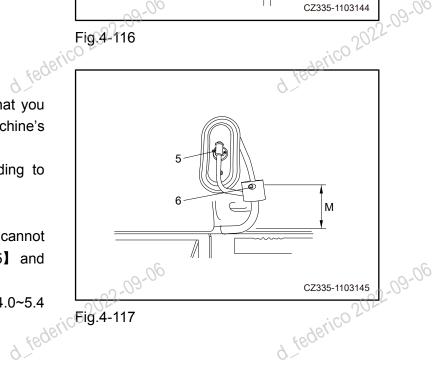
Adjust installation of mirror [B] so that you can see people on right side of machine's rear.

 Install the rear mirror [B] according to picture.

M: 120mm

 During the adjustment, if the mirror cannot be moving smoothly, the screw [5] and [6] can be loosed a bit.

Tightening torque of screw [5]: 4.0~5.4 $N \cdot m (0.41 \sim 0.55 \text{kgf} \cdot m)$



 When adjusting angle of rear mirror, bench mark should be showing of machine side, as is shown on the right picture.

Safety belt

WARNING

- Before using the safety belt, troubleshoot the safety belt and its installation seat. If there is problem, they should be replaced.
- Even if no problem is found, the belt and seat should be replaced every 3 years. The manufacturing date is on the back of safety belt.
- Buckle up during operation.
- Do not twist safety belt during operation.

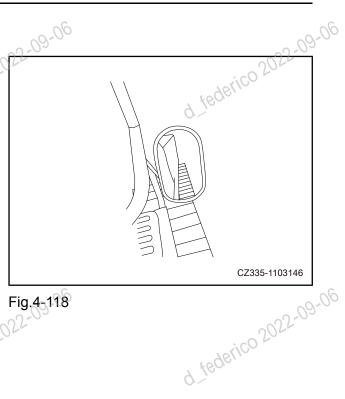


Fig.4-118

NOTE:

it is winding conveying belt therefore no need to adjust its length.

1. buckle up

Hold clip [2] and pull the belt out of coiler [1] . Check that there is no twist on the belt and insert catch [3] into buckle [4].

Check if the belt has been fastened by pulling it slightly.

2. release

Press button on buckle [4] to release catch [3] . The belt will retract into the coiler [1] automatically.

Hold clip [2] so that the belt retract slowly d.federico 2022-09-06 into the coiler.

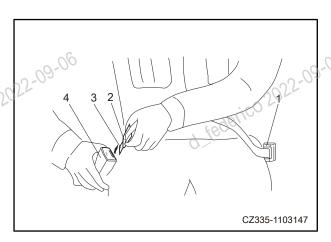
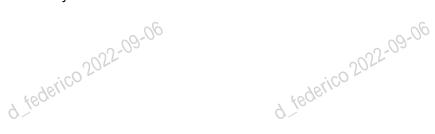


Fig.4-119





Velico 5055-09-06 4.3.1.4 Operation before staring engine

WARNING

- · Before starting the engine, check if the hydraulic lockout control is secured in the LOCKED position.
- If the hydraulic lockout control is not in the LOCKED position, accidental touching of control lever or pedal when starting the engine may lead to unexpected movement of
- LOCKED

 Check if " When rising from the operator seat, make
- 1. Check if the hydraulic lockout lever is in the LOCKED position.
- 2. Check if all control levers and pedals are neutralized. They shall remain in NEU-TRAL position if not operated.
- 3. Turn the start switch to the ON position. d federico 2022-09-06

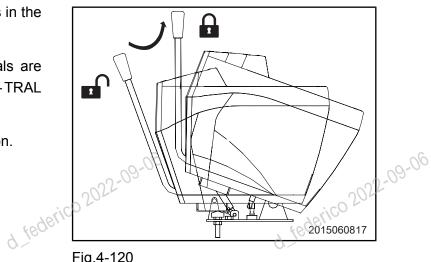


Fig.4-120

- 4. Check the condition of the machine through the gauges on the monitor display.
- When a fault arises, the alarm indicator will
- If a fault code is displayed on the monitor, check the fault immediately.
- If no fault code appears, the alarm indicator may light up because coolant temperature is too high; or engine oil pressure is too high or too low.

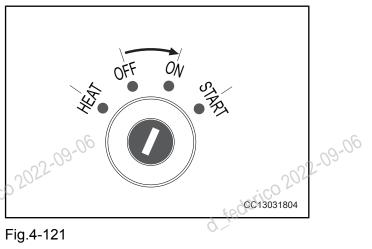


Fig.4-121



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4.3.2 Start the engine

A CAUTION

- Only start the engine from the operator seat.
- Never start the engine by shorting the starter circuit, which may cause serious injury or fire.
- Sound the horn and start the engine after confirming that the machine surroundings are clear of personnel or obstacles.
- Never use any aerosol starting aid, which may cause an explosion.
- Exhaust gas is poisonous. Provide adequate ventilation when starting the engine in a confined space.
- Before starting the engine, check if the fuel control dial is in MIN position for low idling speed. If it is in MAX position, starting the engine can lead to sudden acceleration
- The start switch should not remain at [START] position for more than 10 seconds.
- If the engine doesn't start, wait at least for 1
 minute before restarting the engine.
 - When the engine is started, do not operate any control lever or pedal until oil pressure is within normal operating range. If oil pressure is abnormal, shut down the engine immediately and check oil level and do not joysticks or pedals.

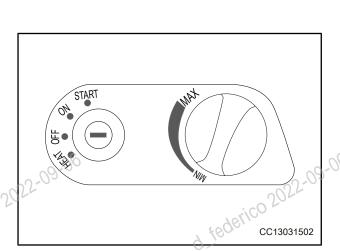


Fig.4-122

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d federico 2022-09-06

1. Check that the hydraulic lockout lever is in the LOCKED position. If it is in the FREE position, do not start the engine. tion, do not start the engine.

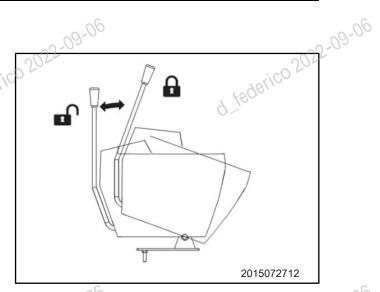
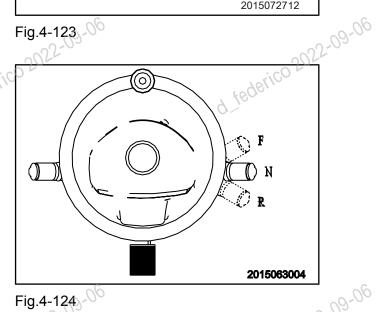


Fig.4-123

2. "FNR" switch should be at neutral position. If "FNR" is at drive or reverse position, the engine will not be able to start.



3. Function choice button is at "P" mode. If it is not at "P" mode the engine will not be able to start.

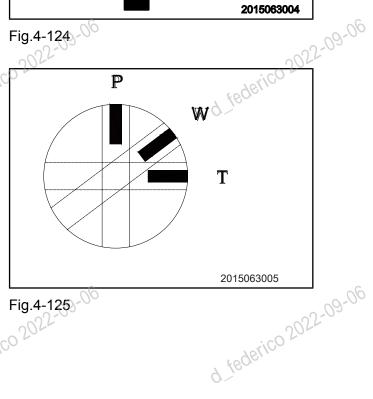


Fig.4-125 d federico 2022

4. Set fuel control dial Turn the fuel control dial to the MIN position. to the MIN position.

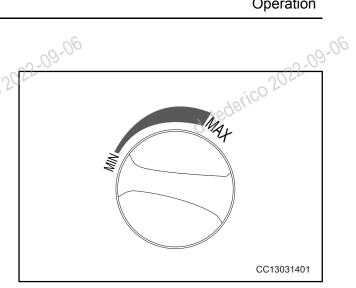


Fig.4-126

5. Turn the start switch to 【ON】 position. d federico 2

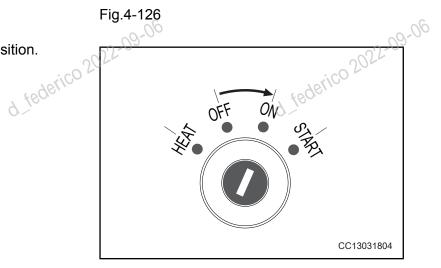


Fig.4-127

6. Turn the start switch to 【START】 position d federico 29 to start up engine. ate steric

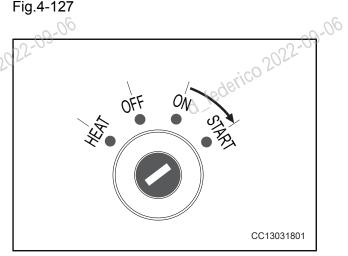


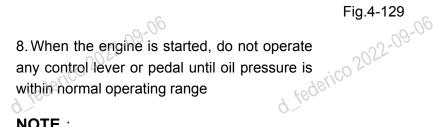
Fig.4-128 d. federico 2022-09-06

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7. Release the switch when the engine is position started. It returns ON automatically.

NOTE:

hen ambient temperature is low, the engine may fail to start after the start switch is kept at START position for more than 10 seconds. In this case, wait at least for 1 minute before restarting the engine.



NOTE:

If oil pressure remains abnormal after four or five minutes, shut down the engine and check oil level. Take necessary actions in case of oil leakage.

4.3.3 Engine Preheating

- If the temperature is below 10°C or if necessary, the engine process will start this function automatically. After the warm up the indicator light [1] on display will go out which shows engine is ready for start.
- · After heating of engine, turn the switch to **[START]** to start the engine;
- If the engine does not work, cut of the electricity of machine first before warming up again and restarting the engine.

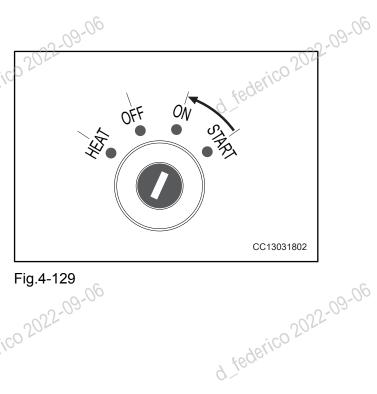


Fig.4-129

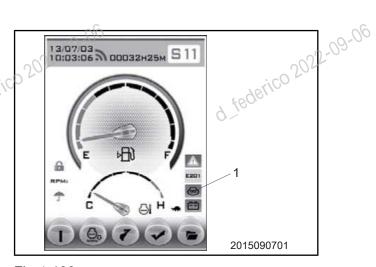


Fig.4-130







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4.3.4 Warming-up operation

WARNING

- In case of emergency, abnormal running of engine, or other faults, turn the start switch key to OFF position and shut off the engine.
- Do not operate any control lever or pedal suddenly when hydraulic oil remains at low temperature. Make sure to warm up the machine till temperature of hydraulic oil rises to a suitable point.
- Insufficient warm-up of the machine may cause slow response or abrupt movement during operation, resulting in serious accidents. Warm-up is especially necessary in cold areas.
- Do not continuously run the engine at low or high speed for more than 20 minutes, which may cause leaks in the oil supply pipe of the turbocharger.

Do not start machine operation immediately after engine start. Check the following items:

- 1. Adjust the fuel control dial to run the engine at a low speed (about 1,100 rpm) for about five minutes.
 - 2. Adjust the fuel control dial to run the engine at a moderate speed (about 1,400 rpm), and then slowly operate the bucket for five minutes.
 - 3. Adjust the fuel control dial to run the engine at a high speed, and operate the boom, arm and bucket for 5-10 minutes.
 - 4. Cycle each action of excavator for several times before ending the preheat operation.
 - 5. Check all gauges for normal display after preheating the machine. Continue to warm up the machine if coolant temperature (see monitor display) and hydraulic oil temperature (50~80°C) fail to reach normal values.
 - 6. Check exhaust color, noise or vibration for abnormality. Repair it if any.







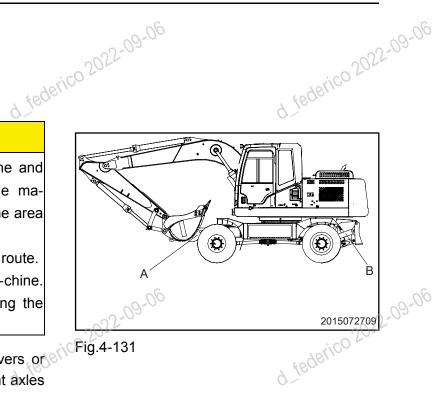
4.3.5 Machine operation

4.3.5.1 summurize

CAUTION

- Check the area around the machine and sound the horn before moving the machine. Nobody is allowed to enter the area around the machine.
- Remove any barriers from the travel route.
- There is a blind area behind the ma-chine. Watch out especially when reversing the machine.

Before operating the travel control levers or Fig.4-131 pedals, make sure the bucket and front axles (A) are in the front and dozer blade & back axle (B) are at the rear (C) of the machine. If vice versa, then travel direction would be opposite to operation direction (both opposite in forward and backward and left and right.)



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4.3.5.2 Turn off the engine

CAUTION

- If the engine is not power off under idle speed mode, the endurance of engine will be lessened. Unless it is emergency, do not stop the engine, when it is spinning at high speed, otherwise there will be fatigue crackling pattern on cover and pressure bearing device will be burnt out.
- 1. Adjust FNR joystick to middle position.
- 2. Put down bucket and dozer bucket to the sp. 1696, ico 5055-08-06 ground and turn all joysticks to middle position.
- 3. Turn the switch to parking position.
- 4. Run the engine at idle speed to cool the engine down.





5. Turn the switch to 【OFF】 position, shut down the engine and take out the key from switch.

NOTE:

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If the machine is already over heated, do not shut it off immediately. Switch it to idle speed first to cool it down gradually before shutting it down.

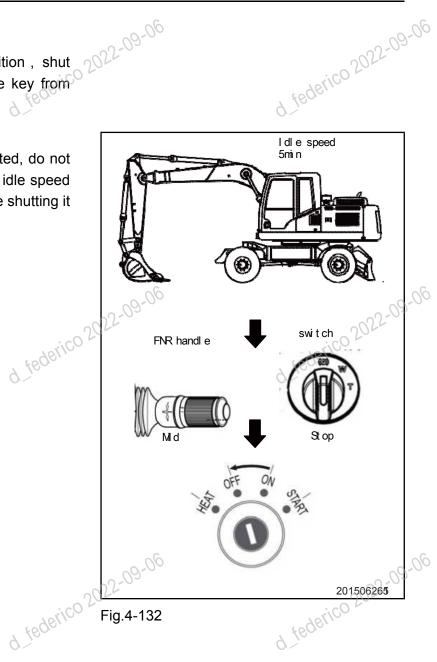


Fig.4-132

d_federico 2022-09-06 4.3.5.3 Machine travelling

CAUTION

- Check if surrounding of machine is clear and press horn before moving the machine
- No one is allowed to enter machine operation area.
- Remove any obstacles along the path
- chine, be especially careful when operating backward.

Basic operation

1. Travelling position

When the machine is still travelling, the dozer blade and back axle should be behind cabin while work equipment is before cabin.

Caution: If dozer blade is in front of cabin, Then the traveling direction is opposite to your operation.

2. Travelling operation

After the engine is started and preheating is completed, take the following steps to move the machine.

- a) keep safety locker at "UNLOCK" position.
- b) keep switch between work position (W) /and travelling (T) position.
- c) Lift up dozer blade.
- d) Choose travel direction.
- e) Set the speed switch to idle position.
- f) Tread slowly for the machine to speed up.

Note of you are traveling in a long distance, insert rotary lock handle first. The handle should be inserted into the brake openings. When accelerating uphill, the travel valve will make a noise. The noise does not mean anything abnormal but just a reminder. Before traveling fast, braking must be checked on a safe zone. If you are traveling in a long distance, insert rotary lock handle first. The handle should be inserted into the brake . uninder. must belerico openings. When accelerating uphill, the travel valve will make a noise. The noise does not mean anything abnormal but just a reminder. Before traveling fast, braking checked on a safe zone.

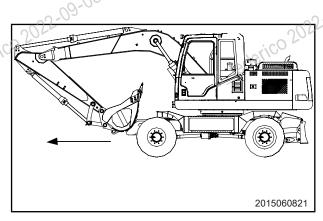


Fig.4-133

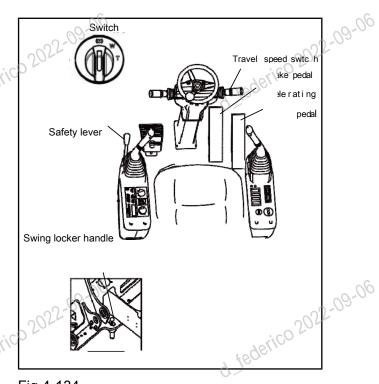


Fig.4-134



3. Alter speed

If speed needs to be altered, Travel speed switch should be altered to the right position.

WARNING

 Do not lower the gear when traveling while increasing the gear is allowed.

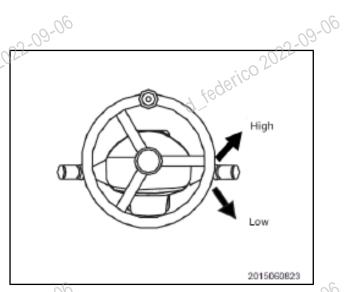
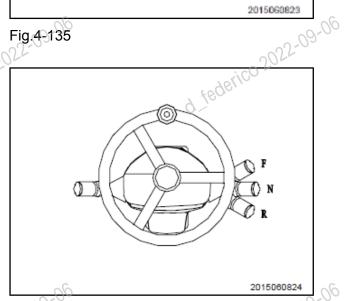


Fig.4-135

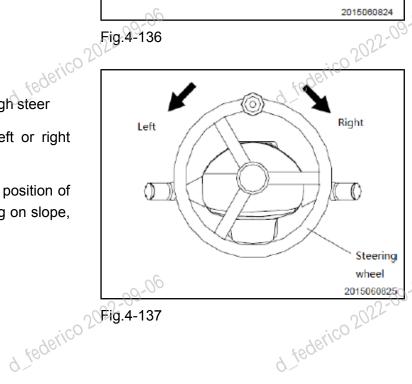
- 2022-09-06 4. Change direction (forward/backward)
- a) Stabilize the machine before changing from forward to backward or vice versa.
- b) Change FNR handler to the right position to alter course.

Note: Confirm there is no obstacle before travelling. If you change from forward to backward or vice versa during travelling is likely to cause damage.



- 5. Machine turning
- a) Control turning of machine through steer
- b) Machine can be changed to left or right direction.

Note: Do not suddenly change the position of control lever or pedal. Avoid turning on slope, do not turn when engine is off.



6. Automatic cruise

Conditions for setting automatic cruise

- a) T mode
- b) Forward mode F
- c) high speed gear II
- d) Travel speed is higher than 1800 rpm
- e) Tread foot pedal home

If conditions above are met, press the button federico 2022-0 of auto-cruise and enter auto-cruise mode. After the mode is set, loosen accelerator pedal slowly.

Conditions for getting out of auto cruise mode.

- a) press auto cruise button.
- b) put on the brake
- c) switch to slope mode W or press to climbing mode C
- d) switch to neutralize mode N

Any condition above will lead to auto cruise

7. Cautions during travelling

The driver must be familiar with the following safety points, including general safety tips.

- a) If warning lamp is lightened, stop the engine immediately and check if related parts are broken.
- b) Engine is not allowed to work under overload mode.
- c) Stop the engine immediately there is strange noise or smell.
- d) Check indicator lights often on switch panel?
- e) No passenger is allowed onboard during traveling.

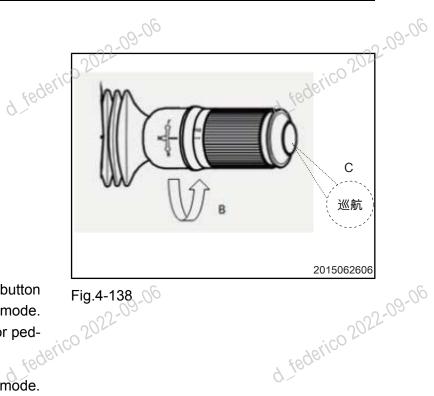
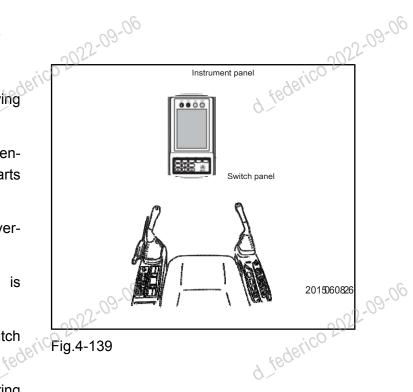


Fig.4-138



- f) Do not embark on and off the engine during operation

 Traveling on a Slope
- a) Do not use neutralize mode when travelling downhill
- b) When travelling downhill, do not allow the machine to slide just according to gravity. Otherwise travelling motor might be damaged.
- c) c) lower the bucket to above the ground 20-30cm(1ft).
- d) If the machine starts to slide or losing its stability, lower the bucket to stop the machine.
- e) Lower the bucket to the ground and park the machine, Put a cushion behind tire to avoid slide.

Note: When oil level is low, the machine cannot travel on the slope, therefore add enough before travelling on slope. Watch out carefully when travelling on slope as machine could d federico 2022-09-06 lose its balance or even tilt.

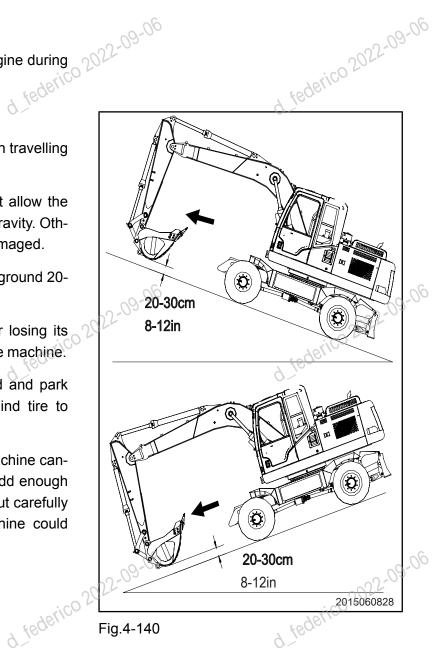


Fig.4-140

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• Parking 2022-09-06

Park according to steps below:

- a) Loosenacceleratorpedals low Ιy
- b) Treadbrakepedal
- c) Place FNR to neutral position.
- d) Lower dozer blade and bucket to the ground
- e) Turn switch in the parking position and release the brake pedal.
- f) Turn the start switch from the ON position to the OFF position and shut off the engine.
- g) Lift the safety lock lever to the locked position.
- h) Insert the rotary lock pin, close all windows, lock the cab door.

Note: Lower the bucket to the ground and park the machine, Put a cushion behind tire

Unless there is an emergency, do not drag the machine. When you have to, follow the below.

1.Ordinary

- a) Parking brake cylinder is under spring force to release hydraulic pressure. When the machine is not working, use brake to stop the machine.
- 3derico 2022-09-06 b) When the distance is short, drag the machine at low speed. A trailer is must used during long distance transport.
- c) A trailer is must used if towing and braking does not work when dragging, you must use trailer transport. If towing and braking does

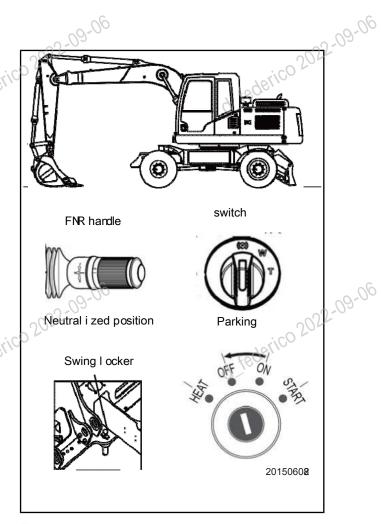


Fig.4-141



d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06 not work when dragging, you must use trailer transport.

Note:

- 1. Dragging the machine in a wrong way can lead to accident or personal injury.
- 2. Strong steel rope must be used when dragging the machine.
- 3. No dragging the machine on a slope.
- 4. Do not enter the area between trailer and
- 5. Make sure trailer and trailed machine are in a straight line.6. Do not drag the machine
- hook.
- 2. Drag the machine
- a) In case travel system pressure is low or travel motor is damaged, cut the input and output power in emergency gear before dragging the machine.

Max dragging speed: 10km/h Max distance: 5km

- b) If there is no gearbox lubrication, lack of grease will cause damage. A trailer is best used fir long distance transport.
- c) Use emergency device and use switch to OFF position. Use a pad to prevent movement. Put the brake pedal in the release state. Loose emergency gear and start the switch to OFF position. Put a Press the grease gun from the grease mouth (1) until the relieve valve (3) is filled Remove the emergency unit
- d) Open the emergency unit drain port (2), drain the oil, and fully release the pressure After excavator starts, switch to low gear switch the low gear to provide 30-35bar pressure, so that the clutch gears match inside the

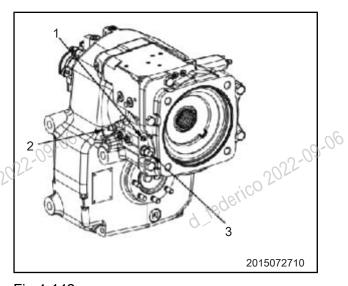


Fig.4-142



4.3.5.4 work equipment control and operation

• When enc.

 When engine speed is already lowered via function of auto idling, a sudden operation on joystick will cause a sudden increase of engine speed. Therefore be careful with joystick.

federico 2022-09-06 The control and operation of work equipment is completed via operating left and right iovstick.CO

When joystick is loosened, the joystick will be back to work equipment and maintain in that position.

Arm stick control

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Turn left joystick forward or backward to control arm stick movement.

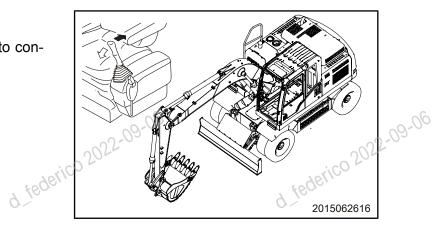
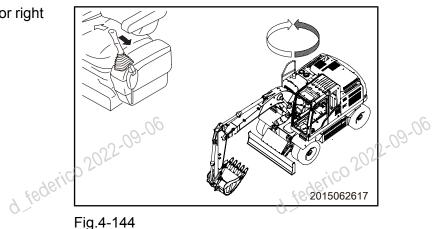


Fig.4-143

 Swing control Turn left joystick to left or right side to control swing movement.









d_federico 2022-09-06

 Boom Control: Control the boom movement by moving the joystick of the right working equipment forward or backward.

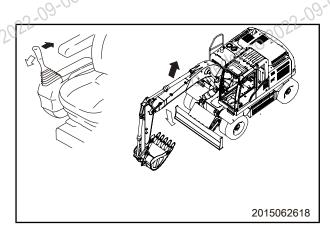


Fig.4-145

 Bucket Control: Control the bucket movement by moving the joystick of the right working equipment to the left or right.

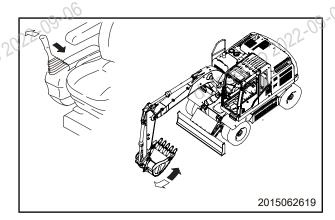


Fig.4-146

Shovel Control

Control shovel movement by moving the shovel joystick forward or backward.

As the working equipment joystick returns to neutral, the operation shall stop for 5 seconds, and even if the fuel control is set to full speed, the automatic idling mechanism can also set in to reduce the engine speed to idle.

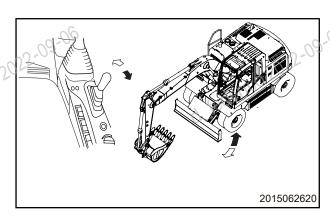


Fig.4-147

NOTE:

The oil control circuit is equipped with an accumulator. If the security lock is set to UN-LOCK and the switch key to ON within 15 seconds after engine shutoff, the joystick is still operable to lower the working equipment to the ground.

This procedure can also be used to relieve the hydraulic oil cylinder of the remaining

d. federico 2022-09-06 pressure or to move the machine to the trailer before boom dropping.

4.3.6 Actions Forbidden

WARNING

- When the machine is on the movement, it is imperative to stop the machine first before operating the joystick.
- · Any joystick operations, in machine automatic idling, shall prompt the engine's sudden speed acceleration.

Actions Forbidden Regarding Rotating Force CO

Do not use rotating force for ground compaction or object breaking, which not only is dangerous but will greatly decrease machine life expectancy.

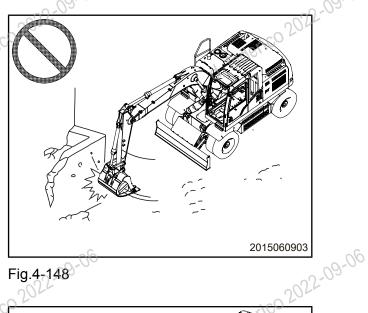
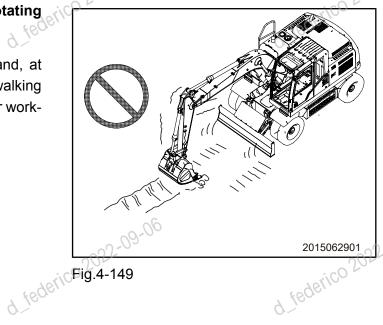


Fig.4-148

2022-09-06 Actions Forbidden Regarding Rotating **Force**

Don't dig the bucket into the ground and, at the same time, excavate by use of walking force, which will damage the machine or working equipment.



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Actions Prohibited with Hydraulic Cylinder at End of Stroke

If the hydraulic cylinder piston is at the end of stroke, the use of the working equipment together with the impact of external forces will damage the cylinder and cause casualties. Operations with the cylinder at full extension or retraction should be avoided.

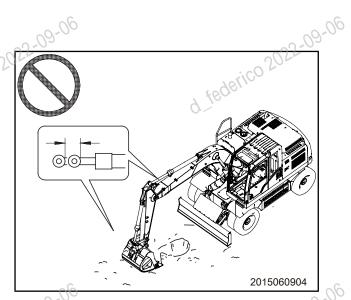
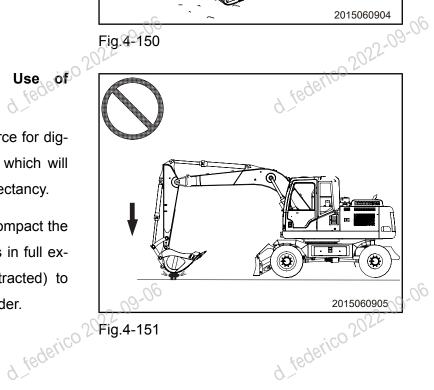


Fig.4-150

Use of Actions Prohibited Regarding Bucket Lowering Force

- 1. Don't use the bucket lowering force for digging, breaking or piling operation, which will greatly reduce the machine life expectancy.
- 2. Do not use the bucket to hit or compact the ground when the bucket cylinder is in full extension (i. e. with bucket fully retracted) to avoid damage to the hydraulic cylinder.



Do not dig hard rock

Do not attempt to dig hard rock ground. It is best to break and crash first in other ways, which will not only reduce the damage to the machine, but also more cost-effective.



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Actions Prohibited Regarding Use of Force of Own Gravity

Do not use the machine's own gravity for digging.

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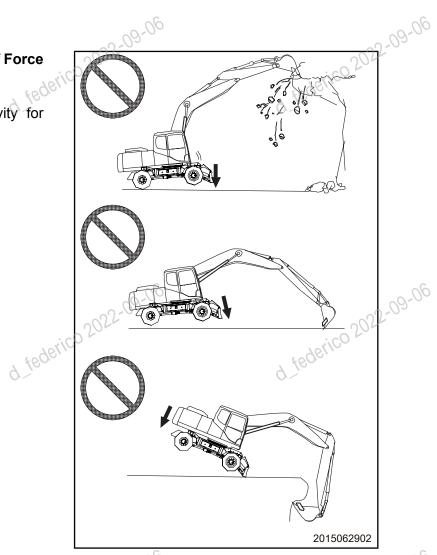
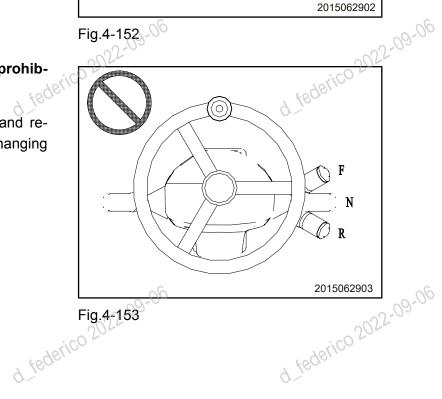


Fig.4-152

Sudden Switch of Driving Direction prohibited when running at high speed

Do not abruptly switch over forward and reverse gears to make the excavator changing operation abruptly.



4.3.7 Allowed Water Immersion Depth

ico 2022-09-06 When the excavator travels out from the water, avoid the rear of upper swing platform from being submerged in water, as engine fan would kick the water, causing fan damage. Pay close attention when driving the excavator out of water.

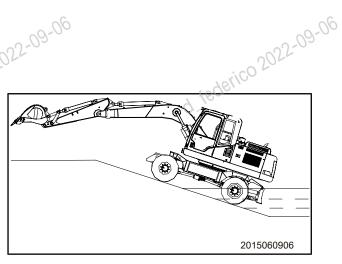


Fig.4-154

- Do not put the machine under the water depth beyond the bridge center.
- Add lubricating grease to components, which have been immersed in water, until the old grease was completely squeezed out of the bearing (esp. around the bucket pin area).
 - Do not operate the excavator in water unless the ground foundation is strong enough to prevent machine from sinking under the bridge center.
- In case that the swing bearing, swing gear and central rotary joint are flooded, remove the drain plug to get rid of mud, clean rotary area, and then put it back. Lubricate rotary internal gear and swing bearing.

Operation Regarding Irresponsive Brake

If the brake pedal could not stop the machine, do emergency braking by use of parking brake switch (P).

Note: Contact SANY dealers for overhaul of d. federico 2022-09-06 braking system after an emergency brake by use of parking brake. Emergency braking is prohibited unless the travel brake fails. d federico

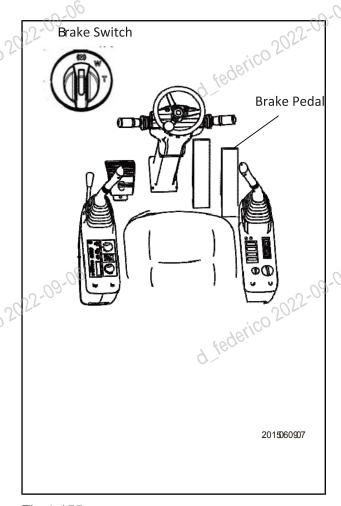


Fig.4-155



4.3.8 Operating on slopes

4.3.8.1 summurize

d_federico 2022-09-06 Do operate or travel in the following correct manners, so that the machine can be stopped any time even when the machine skids or gets unstable.

WARNING

- The excavator may lose balance and tip over when turning around or operating the working equipment on a slope ground, which, therefore, should be prohibited.
- It is dangerous to swing toward the downhill direction with bucket full. If necessary build an earth platform in the slope to maintain the excavator in level.
- Don't drive up a steep ground or travel backwards down a slope, which might cause the machine to tip over.
- D o n't turn around on a slope or travel across a slope, instead, go down to the flat ground before these operations, which can ensure safety despite of inconveniences due to the travel distance.
- When walking uphill, in case that the tire slips or it cannot make it by sheer tire force, do not use the pull of the bucket to make it.
- Climbing above a slope angle over 30° will cause engine de-lubrication.

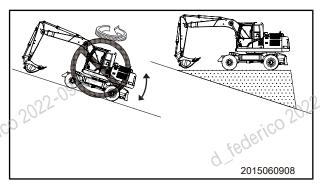


Fig.4-156

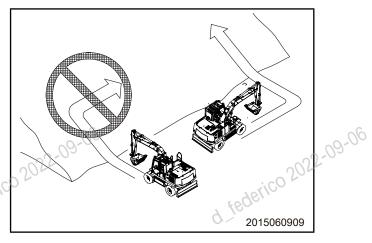


Fig.4-157



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1. When climbing down a steep slope, use the brakes to maintain pace. When driving down a slope with more than 15°, turn the working equipment in the position shown in right illustration and reduce the engine speed.

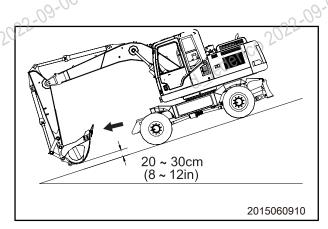


Fig.4-158

2. When on a steep slope, put the working equipment in front to keep balance. Keep the working equipment 20~30cm above the ground and climb at low speed.

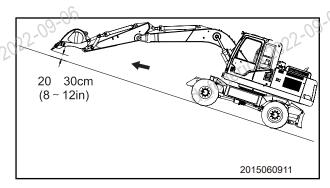


Fig.4-159

4.3.8.2 Engine Stalls on a Slope

- the FNR handle to neutral position. • If the engine in the uphill climb stalls, use the FNR handle to neutral position, turn off pilot switch, select P working mode and restart the engine.
 - If the engine stalls when the machine is in the slope, do not use the joystick for the left working equipment to swing around, as the upper swing platform shall rotate under its own gravity.

• Do not open or close the door of the driver's cab when the machine is on a slope cab when the machine is on a slope, which might cause the machine to lose balance. Do keep the cab door open or closed.



4.3.9 Recommended use

4.3.9.1 summurize

d_federico 2022-09-06 The scope of use can be increased by use of various attachments in addition to the following purposes.

4.3.9.2 Backhoe Operation

Backhoe is suitable for digging ground below the machine level. When the machine is under the circunstances shown on the right (i.e. the angles for the bucket cylinder-connecting rod, and arm cylinder- arm are the same 90 degrees), the maximum digging force can be maintained from the cylunder thrust.

Taking effective advantage of this angle can maximize the work efficiency.

The arm's digging range is from 45° away from the machine to 30° near the machine.

Depending on the digging depth, the range may vary, but try to keep within the above range and do not move the cylinder to the d federic stroke end.

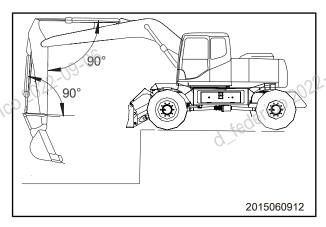


Fig.4-160

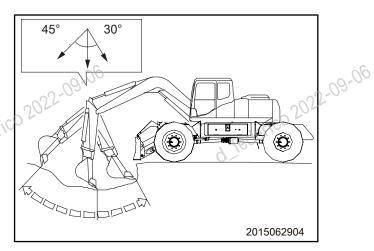


Fig.4-161



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d_federico 2022-09-06

97

4.3.9.3 Trenching Operation

- Trenching could be more efficient when the bucket is up to the digging operation and the tires lined parallel to the drench being dug.
 - When digging wider trenches, both sides of the trench should be ditched first before moving to the central part.
- When digging longitudinally, the shovel should be extended in front to maximize the excavator stability and the lifting capacity. d federico 2022:

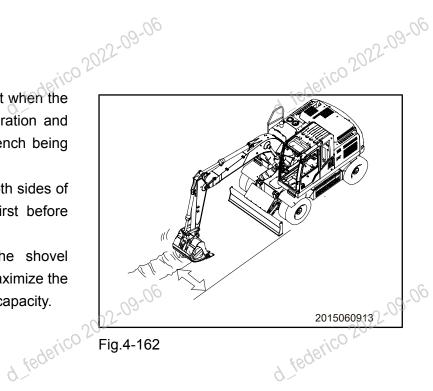
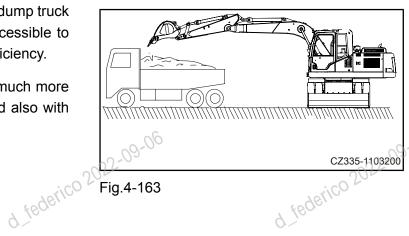


Fig.4-162

4.3.9.4 Loading Operation

In case of a small swing angle, the dump truck should park in a location easily accessible to the excavator operator for better efficiency.

Loading the truck from the rear is much more convenient than from the sides and also with more loading capacity. d_federico 2022-09-



4.3.10 Parking

WARNING

- Unplanned joysĀck operaĀon might cause excavator to move unexpectedly which can lead to serious casualties.
- The safety lock must be turned on when d. federico 2022-09-06 leaving the operator's cab. d. federico 2022-09.



Choose a flat, hard ground for parking and avoid places which might pose possible danger. If the machine has to park on the slope, wedge a pad under the tires (as shown in the right) and dig the bucket into the ground for an additional safety measure.

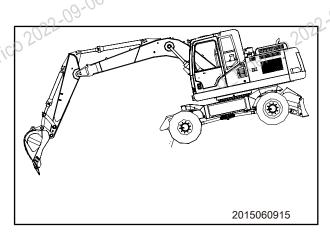


Fig.4-164

1. Place the FNR handle in the neutral [N] position, pedal the brake to stop the machine. d federico

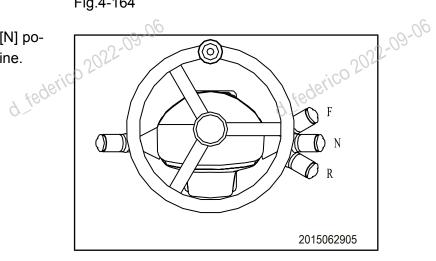


Fig.4-165

2. Turn the fuel control to minimum (MIN) to reduce engine speed. d federico

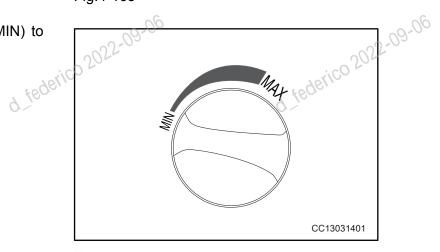


Fig.4-166 d. federico 2022-09-06

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d federico 29 the ground. 3. Lower the bucket horizontally till it reaches

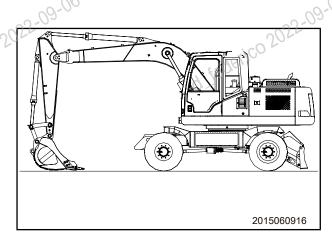


Fig.4-167

d federico 2022 4. Move the safety lock to LOCK.

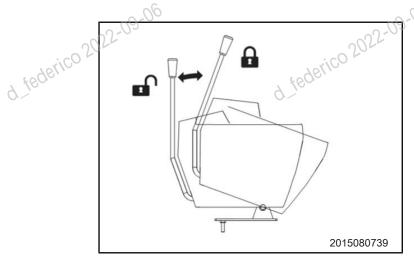


Fig.4-168

- 5. Check engine coolant temperature (shown in the right) and motor oil pressure.
- If the coolant temperature has reached the red range in the gauge, cool down the coolant till it reaches the yellow range before shutting off engine.
 - Turn off the engine immediately when a warning displays in the monitor and the motor oil pressure is out of normal range.
 - 6. Turn off the engine.

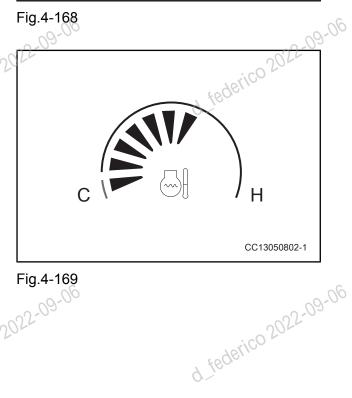


Fig.4-169

4.3.11 Maintenance for Daily Operation

1. Inspect the excavator and check the working equipment, the exteriors and the lower



d_federico 2022-09-06 parts for oil or coolant leakage. Take care of them when needed.

- 2. Fill up fuel tank.
- 3. Check engine compartment for paper or other litter. Clean them up in case of fire.
- 4. Remove dirt stuck below the machine.
- 5. If the ambient temperature is under -35°C, be sure to discharge the radiator and engine coolant (the freezing point is -35°C for coolant currently used by SANY).

4.3.12 Locking

Be sure to lock up the following places:

- 1. cab door and window
- 2. Fuel tank filler □
- 3. engine hood
- 4. toolbox
- 5. left door
- 6. right door
- 7. D/C air inlet
- 8. undercarriage toolbox

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NOTE:

Lock and un-lock the above places with the starting switch.

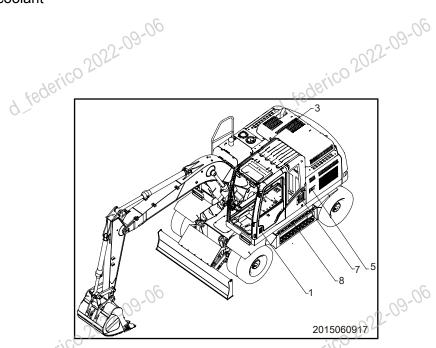


Fig.4-170

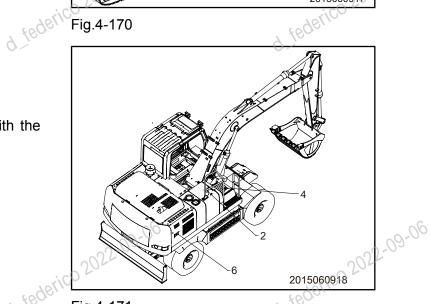


Fig.4-171

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4.3.13 Cold weather operation

iico 2022-09-06 4.3.13.1 Operations in Cold Environment

Instructions

As the engine may not easily get started and coolant may get frozen in low temperature, do the following as instructed.

Fuel and lubricant

Fuel and lubricant with low viscosity should be applied in all components.

derico 2022-09-06 For stipulations on viscosity, refer to "recommended fuel, coolant and lubricants on page 5-9."

Coolant in Cooling System

WARNING

- Antifreeze fluid is toxic. Be careful of your eyes or skin. In case that it touches your eyes or skin, rinse with plenty of water immediately.
- When replacing coolant or handling antifreeze-mixed coolant released in radiator repair, contact SANY dealers or its authorized company. Do not discharge toxic antifreeze into sewer or sprinkle it on ground.
- Antifreeze is flammable. Don't get it close to fire. Do not smoke when handling antifreeze.

NOTE:

please use SANY's authentic TEEC-L35 antifreeze as coolant. We do not recommend using any other coolant other than SANY's authentic antifreeze.

For details about antifreeze-coolant mixture ratio when replacing coolant, refer to "cooling system" coolant" on page 5-6".

Battery

As the ambient temperature drops, battery capacity also decreases. Keep battery capacity close to 100%. Do not put the battery in low temperature for long time.

As battery capacity drops at low temperature, it is necessary to cover the battery, or remove the d federico 2022-09-06 battery from the machine and store in a warmer place, then put it back when needed.

4.3.13.2 Maintenance after Daily Operation

The following precautions should be observed to prevent from dirt and water frozen and



- Remove all dirt and water from the excavator. Keep especially the hydraulic compiston rod clear tor. Keep especially the hydraulic cylinder the seal.
- Park the machine on a hard, dry ground. If possible, park the machine on a board to prevent the tire from freezing to the ground.
- Discharge from blow-down valve accumulated water within fuel to prevent freezing.
- federico 2022-09-06 • Fill up the fuel tank to minimize the moisture condensation in oil tank when the temperature drops.

4.3.13.3 Maintenance after Cold Season

When the weather warms up, do the following:

 Replace fuel and lubricant with specified viscosity. Refer to "Recommended fuel, coolant and lubricant" on page 5-9.

4.3.14 Long-term storage

Prior to storage (for over a month), stretch the machine to the position shown on the right.

Do the following for storage over a month:

- Clean and wash all the components, and park the machine indoor. If outdoor storage is the only option, choose an even ground and cover it with canvas.
- Fill up the fuel tank to prevent water
- Grease the exposed part of the hydraulic cylinder piston rod

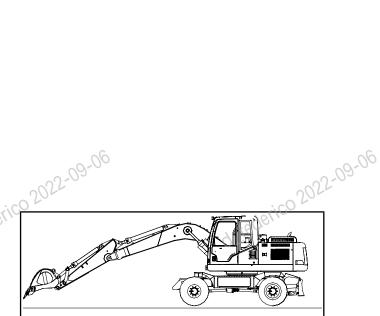


Fig.4-172



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- and cover it, or remove the battery from the machine for separate storage • Disconnect the battery negative terminal machine for separate storage.
 - Lock down the control pedal for the attachment for machines equipped as such.
 - Use SANY authentic coolant to prevent rust.

4.3.14.2 During Storage

WARNING

- For indoor storage, keep the space ventilated from possible poisoning when doing rust removal.
- During storage, operate the machine once every month and drive over a short distance for the components to be re-filmed with oil. Remember to charge battery.
 - Remove all grease from hydraulic cylinder piston before operating the working equipment.
 - If the machine is air-conditioned, turn it on The engine should operate at low idle speed for air-conditioning. The reference of the speed for air-conditioning. once a month for 3~5 minutes to lubricate speed for air-conditioning. The refrigerant should be examined twice every year.

4.3.14.3 Operations After Storage

In case that no rust removal has been done on a monthly basis when machine is kept for long time storage, contact SANY authorized dealer before use. Do the following when operating again after long time storage:

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- Remove grease off the hydraulic cylinder piston.
- Grease all lubricating parts.
- The moisture in the air shall be mixed with oil when in long time storage. Examine the oil before d federico 2022-0 and after starting the engine. Drain out the water in case the water gets mixed with oil.

4.3.14.4 Start engine after long storage

Warm up the machine fully when starting engine after long time storage. For details, refer to "Machine warm-up operations" on page 4-75.



4.4 transportation

4.4.1 Summurize

d_federico 2022-09-06 All relevant laws and regulations should be complied with for the sake of safety during transportation.

4.4.2 Transport by Road

The maximum speed is 37km/h. Trailer is not required for short distance transportation, however. trailer is convenient for long distance.

Do the following in road transportation:

- Comply with the machinerelated regulations;
- Check before starting machine every day
- Check whether the bridge can stand its weight when traveling through a bridge. Reinforce the bridge or bypass it if necessary.
- Rest every half hour over long distance transportation to cool down tires and other d_federico 2022-09-06 parts and check for abnormalities.
- Travel with offload.

4.4.3 Transportation Methods

- Select transport methods that corresponds to the weight and size provided in the technical specification section.
- The weight and dimensions provided in the "technical specifications" may vary according to the bucket or other accessories.
- Contact SANY authorized dealers for the excavator transportation with cab protection d federico 2022-of

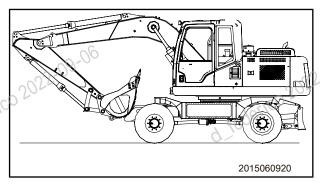


Fig.4-173

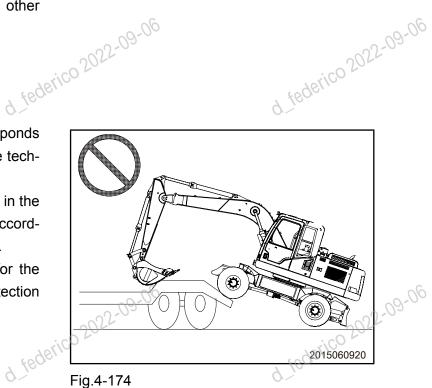


Fig.4-174

4.4.4 Trailers for loading and unloading machine

4.4.4.1 summurize

Observe the following regarding the springboard and trailer platform:

- Load and unload by using springboards with sufficient width, length, thickness and strength and with a maximum 15° slope.
- Compact the ground when loading/unloading by use of piled- up earth to prevent collapse.
- To prevent machine from slipping on the springboard, clean the machine track and springboard before loading/unloading.
 - Excavator might slip on watery, snowy, greasy, frozen springboard.

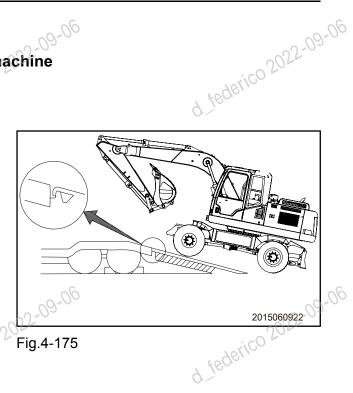


Fig.4-175

4.4.4.2 Loading

1. Load/Unload only on solid, smooth surface.

Maintain a safety distance away from road edge.

- 2. Apply brake to the trailer and place wedge under the tire [1] to prevent unexpected trailer movement.
- Put the left and right springboards [2] in parallel and with equal distance to the trailer central line [3]. The maximum sloping angle [4] is 15°. If the springboard bends greatly under machine weight, place a pad under the springboard.

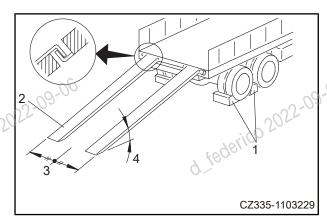


Fig.4-176





- 3. Switch from travel speed to low speed on the monitor screen and turn off automatic idle speed.
- 4. Turn the fuel control to [MIN] and set the engine to low idle speed.

WARNING

- Turn off automatic idling when the machine is climbing up or down the trailer. In case that the auto idle is on, the engine speed will change dramatically.
- · When the machine is climbing up or down the trailer, keep it in the "low speed" mode. Do not change the speed arbitrarily.
- 5. If the machine is equipped with the working equipment, move it forward with the equipment placed in front. If there is no working equipment, move it backward on the springboard.

Support the bucket on the trailer when climbing. Especially in backward climbing, do follow the instructions and signal.

WARNING

- Do not adjust direction on the springboard, for fear of tipping over.
- Do not operate other joysticks except for
- If necessary, move to the ground or trailer before adjusting direction.

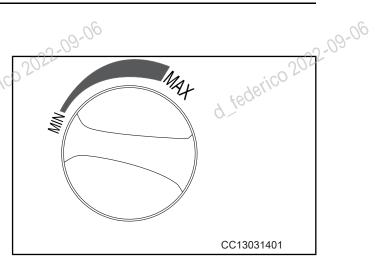


Fig.4-177 Derico 2022-09-06

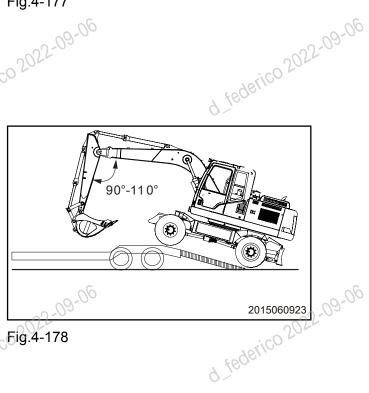


Fig.4-178





6. Make sure that the machine is in a straight line with the springboard, and the center line of the machine corresponds to the trailer's.

Move slowly in the springboard direction. Lower the working equipment as much as possible.

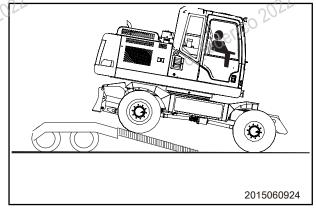


Fig.4-179

- 7. Walk slowly until the machine is fully on the trailer and firmly stays on the board.
- 8. When the machine is moving through the rear wheels of the trailer, it shall lean forward. Be careful that working equipment should not be in contact with the trailer.
 - 9. Lift the bucket gently, retract and keep it low, then rotate the upper machine over 180°.
 - 10.Extend bucket and arm cylinder fully and then lower the boom.
 - 11.Place a wood en pad at the end of bucket cylinder to avoid it touching the floorboard and cause damage to the cylinder.

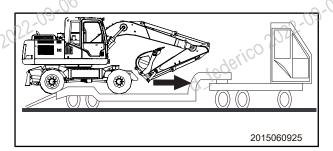


Fig.4-180

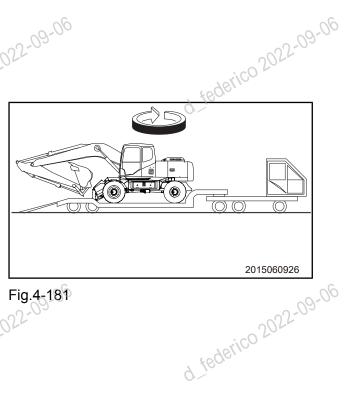


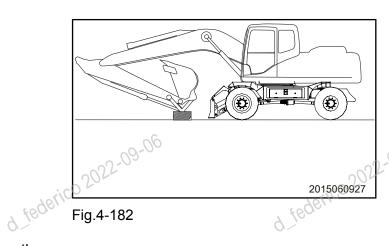
Fig.4-1817

4.4.4.3 Fastening Machine

 To avoid damage to bucket cylinder during transportation, place a wooden pad at the



• Check the engine hood lock. If the hood is not locked securely, it might open distransportation



d federico 2022-09-06 Fasten the machine in the trailer as per the following:

- 1. Extend fully the bucket and arm cylinder, and then lower the boom.
- 2. Place the safety lock in LOCK.
- 3. Place the swing lock device in locking position and the selector switch in parking position.
- 4. Turn off the engine and remove key from start switch.
- 5. Close all doors, windows and covers. Lock cover and door.
- 6. Place pads at both ends of the tire to prevent machine movement during transportation. Fasten the machine with chain or rope d_federico 2022-09-06 with suitable strength. Pay particular attention to fastening the machine in appropriate locations to prevent it from sliding to the sides.

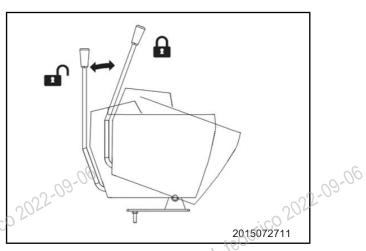


Fig.4-183



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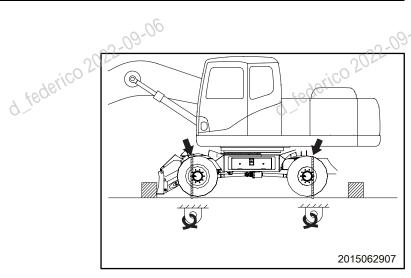
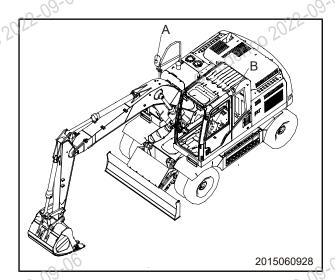


Fig.4-184

Rear View Mirror

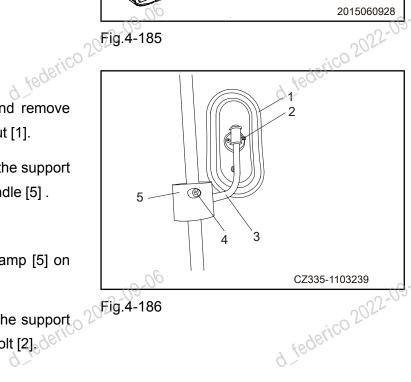
See the figure on the right for rear view mirror. Do the following when the rear view mirror is damaged or needs to be unloaded.



- Removal
 1.1 1. Loosen the mounting bolt [2] and remove the rear view mirror [3] from the strut [1].
 - 2. Loosen the bolt [4] and remove the support rod [3] and the clamp [from] the handle [5].

Installation

- 1. Place the support [3] and the clamp [5] on the handle and tighten the bolt [4].
- 2. Put the rear view mirror [1] on the support rod [3], then tighten the mounting bolt [2].





view mirror, see "Rear view mirror" on page 4-67. · Make adjustments after installing the rear 4-67.

4.4.4.4 Unloading

- 1. Load/Unload only on the solid, smooth surface. A safe distance should be maintained from the road edge.
- 2. Apply brake to the trailer, and place the wedge [1] under the tire to prevent unexpected trailer movement.
- Place the left and right springboard to the parallel and with equal distance to the center line of the trailer. If springboard bends greatly under machine weight, place pad under springboard.
- 3. Remove the fastening chain and rope.
- 4. Start the engine for a full warm-up.
- 5. Place the safety lock to UNLOCK
- 6. Switch the traveling speed to low speed, and turn off automatic idling.

WARNING

- When the machine is on or off the trailer. the automatic idling function should be cancelled. If the auto idle function is in the starting state, the engine speed will change dramatically.
- When the machine is on or off the trailer, the walking speed should be kept in the "low speed" mode. Do not arbitrarily d.federico 2022-09-06 change the walking speed. d federico 2022-1

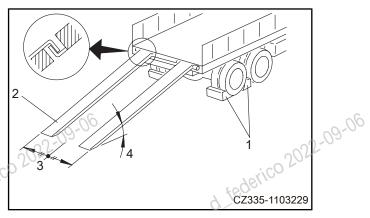


Fig.4-187

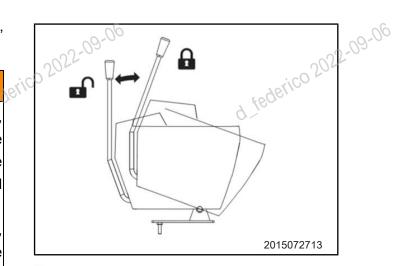


Fig.4-188

7. Turn the fuel control knob to [MIN] position, set the engine speed to low idle speed.

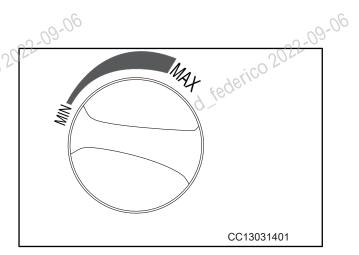


Fig.4-189

- 8. Raise the working equipment, retract the bucket back under the boom, and then slowly start the machine.
- 9. Stop the machine when the machine reaches the top of the trailer.

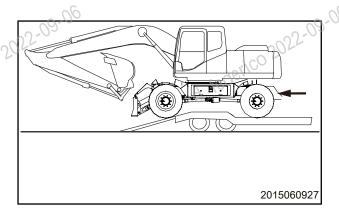


Fig.4-190

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- NOTE: 2022-09-06 Keep the arm-boom angle to be 90-100 when moving the machine off.
- It might cause damage to the machine to unload the machine with arm retracted.
- Do not dig the bucket into ground when the machine has been moved to the springboard, which might cause damage to the hydraulic cylinder.

10. Adjust the arm-boom angle to be 90-100 when moving to the springboard, lower the bucket to the ground and move the machine slowly.

11. Slowly move the boom and bucket when moving down the springboard until the machine gets completely off the springboard.

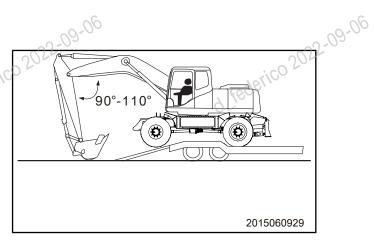


Fig.4-191

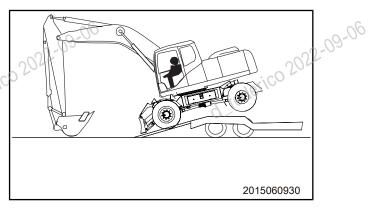


Fig.4-192

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Maintenance

| 5 Maintenance5.1 Maintenance Information5.2 Oil, fuel and coolant | 206 | 206 |
|--|--------------------------|--------|
| 5 Maintenance | | 5-1 |
| 5.1 Maintenance Information | | 5-5 |
| 5.2 Oil, fuel and coolant | 6110 | 5-7 |
| 5.2.1 Oil | | 5-7 |
| 5.2.2 Fuel | | 5-8 |
| 5.2.3 Coolant | | 5-8 |
| 5.2.4 Grease | | 5-9 |
| 5.2.5 Oil and fuel storage | | 5-9 |
| 5.2.6 Filter element | | 5-10 |
| 5.3 Electrical system | | 5-10 |
| 5.4 Wear Parts | | 5-10 |
| 5.5 Recommended Fuel, Coolant and L | ubricant | 5-11 % |
| 5.6 Tightening Torque Table | 203-09 | 5-15 |
| 5.7 Safety Critical Parts | c0 20° | 5-18 |
| 5.6 Tightening Torque Table | 1811 | 5-20 |
| 5.9 Maintenance Procedures | | 5-22 |
| 5.9.1 Initial 50 hours of operation (o | only the first 50 hours) | 5-22 |
| 5.9.2 If required | | 5-23 |
| 5.9.2.1 Check and tighten the nut | t of wheel | 5-23 |
| 5.9.2.2 Check and tighten the nut | t of transmission axle | 5-23 |
| 5.9.2.3 Bucket - replace | | 5-24 |
| 5.9.2.4 Bucket tips - replace | | 5-26 |
| 5.9.2.5 Bucket clearance - adjust | | 5-28 |
| 5.9.2.6 Window washer fluid leve | l - check/fill | 5-29 |
| 5.9.2.7 Refrigerant level - check | | 5-30 |
| 5.9.2.8 Ceiling window gas spring 5.9.3 Inspection before the Startup | g - inspect | 5-32 |
| 5.9.3 Inspection before the Startup | | 5-34 |
| 5.9.4 Every 100 service hours | | 5-34 |
| 5.9.4.1 Lubrication | | |
| | | |

| | -6 |
|--|-------------|
| 5.9.4.2 Blade lubrication | E 37 .09-00 |
| 5.9.4.2 Brade lubrication | 5-37 |
| 5.9.5 Every 250 Service Hours | |
| 5.9.5.1 Air filter element - inspect/clean/replace | 5-42 |
| 5.9.5.2 Chack the vehicle axis and gearbox, oil level, add oil and check the fre | 5-45 |
| 5.9.5.3 Check the vehicle axle and gearbox ,oil level, add oil and check the fro and rear wheel axle oil | |
| 5.9.5.4 Lubricate the transmission shaft | |
| 5.9.5.5 Lubricate front axle oscillating shaft | |
| 5.9.5.6 Lubricate front axle oscillating shaft | |
| 5.9.6 Every 500 service hours | |
| 5.9.6.1 Introduction | |
| 5.9.6.2 Swing bearing - lubricate | 5-51 |
| 5.9.6.3 Engine pan oil and filter element - change/replace | 5-52 |
| 5.9.6.4 Check the height of the grease in the rotating pinino and add grease | CO 502 |
| greasegrease in the rotating pinino and add | 5-53 |
| 5.9.6.5 Primary fuel filter element - replace | 5-55 |
| 5.9.6.6 Secondary fuel filter element - replace | 5-57 |
| 5.9.6.7 Radiator and oil cooler fins - inspect/clean | 5-59 |
| 5.9.6.8 Air conditioner fresh air/recirculation filter - clean | |
| 5.9.6.9 Swing drive oil level - check/fill | 5-64 |
| 5.9.7 Every 1000 service hours | 5-65 |
| 5.9.7.1 Introduction | 5-65 |
| 5.9.7.2 Hydraulic oil return filter element - replace | 5-65 |
| 5.9.7.3 Swing drive oil - change | 5-67 |
| 5.9.7.4 Cab door lock and front window lock catch - inspect/tighten | 5-68 |
| 5.9.7.5 Cab door hinge and front window slide rail - inspect/add grease | |
| 5.9.7.6 Windshield wiper arm nut - Inspect/tighten | 5-70 |
| 5.9.7.7 Engine exhaust pipe clamps - check | 5-70 |
| 5.9.7.8 Fan belt tension - check/replace | |
| 5.9.7.9 Nitrogen pressure in accumulator (breaker) - check | 5-70 |
| 5.9.7.10 Breather valve - service | |
| 5.9.8 Every 2000 service hours | |
| 5.9.8.1 Introduction | |
| 5.9.8.2 Hydraulic oil suction filter element clean/replace | |
| 5.9.8.3 Check the nitrogen pressure in the accumulator | 5-73 |
| 5.9.8.4 Cooling system interior - clean | 5-75 |
| | |
| 5.9.8.6 Engine valve clearance - check/adjust | ∴ 5-78 |
| 5.9.9 Every 4000 service hours | |
| 5.9.9.1 Introduction | |
| 5.9.9.2 Water pump - inspect | 5-78 |

| 00.00 | 20- |
|---|------|
| 5.9.9.3 Start motor - check | 5-78 |
| 5.9.9.3 Start motor - check | 5-79 |
| 5.9.9.5 Accumulator - replace | 5-80 |
| 5.9.9.6 High-pressure tube clamps and rubber - check Fig. 5 | 5-81 |
| 5.9.9.7 Compressor working condition - inspect | 5-82 |
| 5.9.10 Every 8000 service hours | 5-82 |
| 5.9.10.1 Introduction | 5-82 |
| 5.9.10.2 High-pressure tube clamps - replace | 5-82 |
| 5.9.11 Every 10000 service hours | 5-82 |
| | |

d. federico 2022-09-06

d_federico 2022-09-06

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WARNING

Read and understand all safety precautions and instructions in this manual before reading any d_federico 2022-09-06 other manuals provided with this machine and before operation or maintaining it. Failure to do this could result in death or serious injury. d federico 202

d federico 2022-09

d_federico 2022-09-06 Maintenance Information Rederico 2022-09-06

Never conduct any inera Never conduct any inspection and maintenance work other than the scope specified in this manual.

Service hour meter reading

Check the service hour meter reading on a daily basis and determine whether the machine requires the specified maintenance.

Genuine Sany parts

Always use genuine Sany replacement parts listed in the Parts Manual. tederico

Genuine Sany lubricants

d_federico 2022-09-06 Always use genuine Sany oil and grease. Select oil and grease of suitable viscosity according to ambient temperature.

Window washer fluid

Use automotive windshield washer fluids only. Make sure it is not contaminated by foreign substances.

Using clean lubricants

Always use clean oil and grease and keep the container clean. Keep oil and grease free of any d federico impurities.

Checking the drained oil and used filter elements

After oil change and filter element replacement, check the used oil and filter element for signs of metal particles and foreign material. If large amount of metal particles and/or impurities are observed in the used oil and filter element, take immediate action or inform your boss in time.

Fuel strainer

If a fuel strainer is equipped in the fuel tank filler opening, do not remove it when filling the tank. 2022-09-06

Welding instruction

- Disconnect the negative (-) post of the battery one(1) minute after turning off the start switch.
- Connect grounding cable in a place where is more than 1 meter from the welding location. The meters and gauges will fail if the grounding cable is connected to the instrument, connectors or other attachments.

- If any sealing part or bearing is present between the welding location and the grounding point,
 change the grounding point to avoid such parts
- Never use a grounding point in the vicinity of the work equipment pin or hydraulic cylinder.
- Never apply more than 200V continuously.

Preventing things from falling into machine

- When opening the access window or tank filler for inspection, make sure that the nuts, bolts or tools are not left inside the machine. Failure to do so may result in unexpected failure or damage to the machine, or accidents. In case that any materials fall into the machine, remove it immediately.
- Do not carry unnecessary items in your pockets except those necessary for inspection.

Dusty work site

Observe the following items before working in a dusty place:

- federico 2022-09-06 When inspecting your machine or changing the oil, park your machine in a dust-free place in order to prevent dust from getting into the oil.
- Clean the air filter cartridge immediately if the filter's alarm indicates clogging.
- Clean the fins and other heat exchanger parts frequently to avoid them being clogged.
- Clean and replace the fuel filter frequently.
- Clean the electrical components, especially the start motor and the alternator, to prevent dust from building up on them.

Lubricants of different brands

Never mix lubricants of different brands and/or grades together. If you need to use the lubricant of another brand or grade, drain the old lubricant completely and replace with the new brand

Securing access cover

When servicing the machine with the access covers open, use a locking lever to secure the cover to certain position. Otherwise, the cover can be swung close by wind and cause bodily injury.

Purging air from hydraulic system

When any hydraulic units have been repaired or replaced or any hydraulic lines have been rerico 2022-09-06 ico 2022-09-06 moved or installed, always bleed the air from the system.

Connecting hydraulic hoses

 In removal of parts with O-rings or gaskets, clean the installation surfaces and replace with new parts. Remember to install the O-rings or gaskets.



 Do not twist or bend the hydraulic hoses when assembling. Failure to do so could cause damd federico 2 age to the hoses and considerably reduce their service life.

After inspection and maintenance

If no checks have been made after inspection and maintenance, unexpected failure may occur, causing severe injury or damage. The following items must be observed:

- Checks when machine is running
 - For more information, see "Maintenance with engine running" on page 2-73.
 - Whether the checked or maintained parts work normally.
 - Whether oil leakage occurs when the engine speed increases and the oil is under pressure.
 Checks after the operation (when the engine has been shut down)
 Whether you have missed the items to be checked or maintained.
- Checks after the operation (when the engine has been shut down)

 - Whether all the checks and maintenance have been performed correctly.
 - Whether any tools and parts are left in the machine. It is very dangerous to have a foreign object blocked in the linkage.
 - Whether leakage of water or oil occurs; whether all the bolts have been screwed tightly.

Closing engine hood properly

When the engine hood is closed after inspection and maintenance, hold the lever and lift the engine hood slightly in order to check whether the lock is securely engaged. An unlocked hood may d federico d federico be opened and cause accidents.

5.2 Oil, fuel and coolant

5.2.1 Oil

- The oils in engine and hydraulic units keep deteriorating when operating your machine under extreme conditions, such as high pressure and high temperature.
- Always use recommended type of oil which shall also be applicable under extreme ambient temperatures.
- Within the specified oil change interval, the oil must be changed even if it is not dirty.
- Lubricant shall be handled carefully in order to prevent impurities such as water, metal particles and dust.
- Most troubles of the machine are caused by impurities. Pay special attention to the prevention of any impurities when storing or filling the oil.
 - Fill the amount of oil as specified. Failure to do so could result in abnormality.



- Do not mix oils of different grades or brands together.
 Contact Sany dealer when the mineral contact sand dealer when the mineral con Contact Sany dealer when the oil in your work equipment has been contaminated by water or air.
- To know the condition of your machine, regular oil quality analysis is recommended. Contact Sany dealer if you need such service.
- In replacement of engine oil filter element, acceptable clean oil shall be filled into the new filter element prior to installation.
- Please use the oils approved by Sany.
- Do not use the hydraulic oil that has not been approved by Sany, which can block filter cartridge.
- Remove the remaining oil as much as possible from the lines and cylinders when changing the ico 2022-09-06 hydraulic oil. A small amount of different residual is acceptable.

5.2.2 Fuel 02-09

- To prevent the moisture in air from condensing in the fuel tank, the tank must be fully refueled after each workday.
- The fuel injection pump is a precise component, which may not work normally if the fuel contains water or other foreign substances.
- The sediment and water in the fuel tank must be drained before starting the engine or after 10 minutes since injection of oil.
- Flush the fuel tank and the fuel system in case of any impurities found in the fuel tank.
- The air in fuel path must be eliminated in case that the engine runs out of fuel or the filter cartridge has been replaced.
- Always use the type of fuel specified in the "Maintenance" section.
- The fuel can freeze below the specified temperature (especially lower than -15°C (5°F)).
- When the fuel is used above the specified temperature, its viscosity and output power will decrease.
- Pay special attention to prevention of impurities when storing or refilling the fuel.

NOTE:

- Always use diesel oil as the fuel.
- To ensure favorable consumption and exhaust of the fuel, the engine installed to your ma-chine uses high-pressure oil injection unit with mechanical control. The unit contains high- precision components that require high-quality lubrication. Therefore, the use of low-viscosity fuel with low lubricating capability will considerably reduce the service life of the unit.
- dilute sulphuric acid that will impair the engine. To prevent such fault, always use a fuel whose sulfur content is lower than 0.2% d federico 20 d federico sulfur content is lower than 0.2%.

5.2.3 Coolant

The coolant is an important fluid against corrosion and freezing.



Anti-freezing coolant is also necessary in regions where freezing prevention is unnecessary.

- Sany recommends TEEC-L35 antifreeze. This antifreeze has a concentration of 50% and needs no dilution. TEEC-L35 antifreeze has excellent performance in anticorrosion, anti- freezing and cooling, and can last for one year or 2000 hours.
 - Sany does not recommend you using coolants other than TEEC-L35 antifreeze. The use of other coolants is possible to cause serious problems, such as corrosion of the light metal parts of the engine and cooling system.
 - If you buy antifreeze from the market, make sure that the antifreeze's concentration is within the range 30-68% in order to ensure its performance against corrosion.
 - The ratio of mixing antifreeze with water is determined by the minimum ambient temperature, as shown in the following table.

Water-antifreeze mixing ratio

| 0.1. | | | | 0.7. | | | | 0.7. |
|---------------------|----|-----|------|------|-----|-----|-----|-----------------|
| Min. temperature | Ç | -10 | -15 | -20 | -25 | -30 | -35 | 2.40 |
| o limit temperature | °F | 14 | 6065 | -4 | -13 | -22 | -31 | -4 0 |
| Mixing ratio (%) | | 30 | 36 | 41 | 46 | 50 | 54 | 58 |

NOTE:

- Use distilled water or tap water (softened water) to dilute anti-freezing coolant.
- Natural water, such as river water and well water (hard water), contains large amount of minerals (calcium, magnesium, etc.), which can easily scale in the engine and radiator. The scale is hardly removed once formed in the engine and radiator. Overheat can occur due to unfavorable heat exchange. ico 2022-09-06

5.2.4 Grease

- Grease is used to prevent distortion and noise of joints.
- federico 2022-09-06 • It is necessary to add grease to any component that appears inflexible or noisy after operation for a long period.
- · Always use the recommended greases. Select the grease according to change interval and ambient temperature recommended in this manual.
- Wipe off the used grease that has been squeezed out when greasing. Make sure to wipe off the used grease that has been contaminated by sand or debris, which can otherwise lead to wear of rotating components.

5.2.5 Oil and fuel storage

- Store the oils and fuel indoors in order to keep them free from water, dust and other foreign substances.
- To store the barrel of oil or fuel for a long period, it is necessary to place the barrel with its opening facing the side in order to prevent intake of moisture. If you have to place the barrels outdoors, cover them properly with waterproof canvas or take other protective measures.

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• To prevent deterioration of oil or fuel during long-term storage, use the oil or fuel that has been stored earlier than others. d federico 2 d. federico?

5.2.6 Filter element

- Filter element is extremely important for safety. It can prevent failures by keeping important devices free from impurities coming from oil path or air path. All filter elements must be re-placed regularly. For more information see related sections in this manual.
- When operating in severe conditions, the filter elements shall be replaced more frequently according to the sulfur content in lubricant and fuel.
- In replacement of filter element, check the element for attached metal particles. Contact Sany d_federico 2022-09-06 dealer if metal particles are found.
- Do not open the package of a spare element when it is in storage. d federico 21
- Use genuine Sany elements.

5.3 Electrical system

- Humid electrical devices or damaged wire can cause short circuit and machine failure. Do not flush the interior of your cab with water. When flushing your machine, be careful with water, which shall not penetrate into the electrical components.
- Electrical system maintenance correlates to checking the tension, damage or wear of fan belt.
- Do not install any other electrical components except those specified by Sany.
- External electromagnetic interference can cause failure of system controller. Contact Sany dealer before installing radio receiver or other wireless devices.
- Operating on beach requires cleaning the electrical system thoroughly in order to prevent corresion. corrosion
- When installing an electrical device, connect it to dedicated power source. Do not connect other power sources to the fuse, start switch or battery relay.

5.4 Wear Parts

- Wear parts, such as filter element, bucket tips, etc. are to be replaced at the time of periodic maintenance or before their abrasion limits.
- The wear parts shall be changed correctly in order to use the machine economically.
- For part change, Sany genuine parts of excellent quality shall be used.
- When ordering parts, please check the part number in the parts book. d federico 2022-09-06 d federico 2022-09-06



| ~0 | 1-00 | 20-0 | | ~O. |
|-----------------------|---------------|--------------------------------------|-----|------------------------------------|
| Component | Part No. | Part | Qty | Interval |
| Primary fuel filter | 60151839 | Filter cartridge | 1 | Every 500 Hrs or clogging |
| Secondary fuel filter | 60250941 | Filter element 1 Filter element 2 | 1 | Every 500 Hrs or clogging |
| Engine oil filter | B222100000494 | Filter cartridge | 1 | Every 500 Hrs |
| Pilot filter | B229900000063 | Filter element(O- ring) | (1) | Every 500 Hrs |
| Hydraulic oil | 60167852 | Element - Intake | 1 | Every 2000 Hrs |
| filter | 60167851 | Element - Return | 1 | Every 1000 Hrs |
| A/C air filter | A222100000429 | Filter - fresh air | 1 | Every 6 Mons |
| A/C air filter | A222100000430 | Filter - recirculation air | 1 | Every 6 Mons |
| Air cleaner | 60186788 | Element | 1 | Cleaned 6 times or every 12 months |
| | | Lateral pin bucket | 4 | |
| | | (Pin) | (4) | |
| Common | | Left cutter | 1 | _ |
| bucket | | Right cutter | 1 | |
| | | (Bolt) | (8) | |
| 00 | -06 | (Nut) | (8) | - <i>v</i> 9: |
| Tyre | 60259767 | yre10.00-20 16PR | 8 | _ 2022 |
| ederic Tyre | 60256194 | yre9.00-20 14PR | O | tegelico 305,500. |
| ~ | | , , , , | | , , , , , |

5.5 Recommended Fuel, Coolant and Lubricant

• Unless specified otherwise, your machine contains the following oils and coolants when delivered from the factory.

| Item | Туре |
|------------------|---------------------|
| Engine Oil Pan | Caltex CI-4 15W-30 |
| Swing Drive | Gear oil 85W/140 |
| Final Drive | Gear 01/85 W/140 |
| Hydraulic System | Caltex HDZ46 |
| Radiator | TEEC-L35 antifreeze |
| Axle Bridge | Gear oil 85W/140 |
| Transmission | Caltex CI-4 15W-30 |

- To keep your machine at the maximum state for a long period of time, it is necessary follow the
 oil instructions described in this manual. Failure to do so can cause over wear and service life reduction of the engine, power train, cooling system and other components.
- The additives available in market could benefit your machine, but they could impair your machine as well. We do not recommend any lubricant additives.
- The specific capacity refers to the overall oil volume in tanks and lines. Supplementary volume refers to the amount of oil used to make up the system in inspection and maintenance.
- The use of multi-grade oils is strongly recommended when starting the engine at temperatures below 0°C (32°F), even if the daytime temperatures rises above 0°C (32°F).
- Use the recommended oils according the ambient temperatures given in the following table.

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| | 00-00 | | | | - 60 | 100 | | | | <u></u> |
|-------------|-------|----------|-----------|-----------|--------------|----------|--------|-------|-------------|------------|
| 3022 | | Table | e of reco | | ed fuel, d | | oolant | | | 022-0 |
| - 1/100 | | | | Ambie | nt Tempe | erature | | | ierico i | Rec- |
| d teger, | -22 | -4 | -14 | 32 | 50 | 68 | 86 | 104 | 12- | om- |
| | | | -1- | | | | | 104 | 2 °F | me- |
| Liquids | | | | | | | | | | nde- |
| | -30 | -20 | -10 | 0 | 10 | 20 | 30 | 40 | 5- | d |
| | | | | | | | | | 0 °C | liq- |
| | | <u> </u> | | | | | | | | uids |
| | | | | | | | | | | 5W- 30 |
| | 00 | Т | <u> </u> | | Т | 06 | | | | 5W- |
| 0.4 | 09-00 | | | | 0.00 | 00 | | | | 4009 |
| Engine oil | | T | | | 202 | | | | | |
| Engine oil | | | | delle | | | | 600 | Jerico (| -30 |
| Engine oil | | | 9- | 1 | | | T | 9 100 | | 15W |
| | | | | | | | | | | -40 |
| | | | | | | | | | | |
| | | | | | | (Note 1) | | | | 40 |
| | | | | | | | | | | <u> </u> |
| | | | | | | | | | | HD |
| | | | <u> </u> | <u> </u> | | I | | | | Z32 |
| | | | | | | 0 | | | | (ISO V |
| | 09-00 | | | | 00 | -00 | | | | G32 |
| Hydraulic | | | | | 2022-09 | | | | | 023 |
| 4100. | | | | - 48 LICE |) | | | 5-1 | ISIICO | HD |
| 9 tegel on | | | 9 | 180 | | | | 9 180 | | Z46 |
| | | | | | | | | | | (ISO |
| | | | | | | | | | | V G46 |
| | | | | | | | | | |) |
| | + | | | | | | | | | -30# |
| | | | | | | | | | | die |
| | | | | | | | | | | sel |
| | | | | | | | | | | fuel |
| Diesel fuel | 09.06 | | | | | 00 | 1 | | | -10# |
| 2022 | 700 | | | | 20212-0- | | | | | light |
| Aerico Lo | | | | 40.1CC |) [| | | 2 | Jerico (| die sel |
| Diesel fuel | | | 9 | 1600 | ,2022-09 | | | 150 |),~ | 0# |
| | | | | | | | | Y' | | light |
| | | | | | | | | | | L |

| | 00- | 06 | | | | 06-06 | | | | | 2-09-06 |
|---------|--------|------|-----------|--------|------------|------------|--------|------------------|-------------|-----------|---------|
| 20 | 122-03 | Tabl | e of reco | ommend | ed fuel, d | oil and co | oolant | | | 202 | 2-03 |
| derico | | | | Ambie | nt Tempe | erature | | | 196 | Rec- | |
| 1,600 | -22 | -4 | -14 | 32 | 50 | 68 | 86 | 104 ^Ò | 12- | om- | |
| | -22 | -4 | -14 | 32 | 50 | 00 | 00 | 104 | 2 °F | me- | |
| Liquids | | | | | | | | | | nde- | |
| | -30 | -20 | -10 | 0 | 10 | 20 | 30 | 40 | 5- | d | |
| | -30 | -20 | -10 | U | 10 | 20 | 30 | 40 | 0 °C | liq- | |
| | | | | | | | | | | uids | |
| | | | | | | | | | | die | |
| | | | | | | | | | | sel | _ |
| | | 00 | | | | 00.06 | | | | TEE | 00-06 |
| 00 | 22-03 | | | | 002 | -03 | | | | C- L35 | 5-03 |
| Coolant | | | | 10 | rico.70 | | | | izas | Anti | |
| 16ger | | | | 4 tede | ico 5055 | | | A | feder | free | |
| 0.7 | | | | 0./ | | | | | | ze | |

NOTE:

The HTHS (high-temperature high-shear viscosity at 150°C) required by ASTM D4741 must be equal to or more than 3.5 mPa-S. Sany recommends use of Caltex15W-40 engine oil.

Recommended oils:

1. Engine oil

Select the oil of proper viscosity according to the temperature range given in the oil change schedule. Engine oil grade: Above API CI-4
Recommended engine oil brand and type: Caltex CI-4 15W-40

2. Engine fuel

2. Engine fuel

Light diesel oil (GB252.81)

d. federico 2022-09-06



A CAUTION

- In most cases, the use of fuel ASTH2 and the diesel oil (minimum cetane number is 40) can achieve the best economic result and operating performance. At where the elevation is high or the ambient temperature is too low, it is necessary to use the fuel whose cetane number is more than 40 in order to prevent flameout and too much smoke.
- Clean fuel free from water and/or impurities shall be ensured before refueling.
- The diesel fuel that contains more water and/or impurities can cause clogging, Please change the filter when it is clogged.

| sulfur containing | change interval |
|-------------------|-----------------------|
| 0.2 ~ 0.5% | 1/2 standard interval |
| 0.5 ~ 1.0% | 1/4 standard interval |

When the fuel of low sulfur content is used, its cloud point shall be at least 10°C lower than the expected minimum fuel temperature. Cloud point is the temperature at which the waxy crystals begin to form.

 The universal diesel fuel of commercial brands shall contain sulfur that is less than 0.2%. If it is more than 0.2%, Please shorten the change interval. Be sure to conduct ac- cording to the following table:

3. Hydraulic oil

The hydraulic system uses Caltex HDZ46-II hydraulic oil (code 60272633)

Table of capacities

| , | 0-09-06 | | Table of capacities | | | | | | -0-09-06 | | |
|-------------|---------|----------------|--------------------------|-------------------|-------------------------|--------------|------------------|-----------------------|--------------------|--|--|
| Model Model | | Engine oil pan | Swing drive casing | Cooling system | Hydraul ic system | Fuel tank | Front axle shell | rear axle shell | Rim gear box | | |
| SY155 | L | 18 | 3 | 15 | 150 | 240 | 9 | 11.2 | 4X2.4 | | |
| W | US gal | 4.8 | 0.8 | 4 | 40 | 62.4 | 2.4 | 3 | 4X2.6 | | |

5.6 Tightening Torque Table

CAUTION

- Nuts, bolts or other parts not tightened to specific torque values may lead to loose or damaged d federico 2022-09. parts, resulting in machine failure and operating troubles.
- Special attention shall be paid when tightening parts. d federico d federico



Unless specified otherwise, the metric nuts and bolts shall be tightened to the values given in the following table.

The tightening of torque is determined by the width of screw cap or nut.

In replacement of the bolts or nuts, use Sany genuine parts of equivalent size.

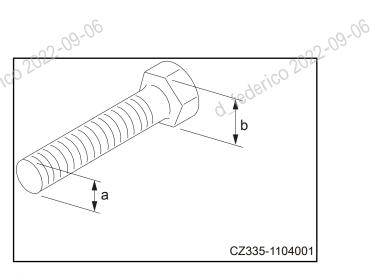


Fig.5-1

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| Thread Square | | | | Tightening Torques | | | | | | |
|---------------|----------------------|----------------------|----------------------------|--------------------------|-------------------------|--|---|--|-----|--|
| Thread Square | | Square | | Oojico | Tighten | ing Torque | es . | ricozo | | |
| 9 48 | Diameter | Size b | 7 | Target Value | es | | Torque Limi | ts | | |
| 0 | a (mm) | (mm) | N⋅m | kgf∙m | lbft | N⋅m | kgf·m | lbft | | |
| | 6 | 10 | 13.2 | 1.35 | 9.8 | 11.8 ~ 14.7 | 1.2 ~ 1.5 | 8.7 ~ 10.8 | | |
| | 8 | 13 | 31 | 3.2 | 23.1 | 27 ~ 34 | 2.8 ~ 3.5 | 20.3 ~ 25.3 | | |
| | 10 | 17 | 66 | 6.7 | 48.5 | 59 ~ 74 | 6.0 ~ 7.5 | 43.4 ~ 54.2 | | |
| | 12 | 19 | 113 | 11.5 | 83.2 | 98 ~ 123 | 10.0 ~ 12.5 | 72.3 ~ 90.4 | | |
| - - | 14 | 22 | 117 | 18 | 130.2 | 157 ~ 196 | 16.0 ~ 20.0 | 115.7 ~ 144.7 | 06 | |
| | 1602 | 24 | 279 | 28.5 | 206.1 | 245 ~ 309 | 25.0 ~ 31.5 | 180.8 ~ 227.8 | | |
| 9.16 | derio 18 | 27 | 382 | d 1639 | 282.1 | 343 ~ 425 | 35.0 ~ 43.5 | 253.2 ~ 314.6 | | |
| | 20 | 30 | 549 | 56 | 405 | 490 ~ 608 | 50.0 ~ 62.0 | 361.7 ~ 448.4 | | |
| | 22 | 32 | 745 | 76 | 549.7 | 662 ~ 829 | 67.5 ~ 84.5 | 488.2 ~ 611.2 | | |
| | 24 | 36 | 927 | 94.5 | 683.5 | 824 ~ 1030 | 84.0 ~ 105.0 | 607.6 ~ 759.5 | | |
| | 27 | 41 | 1320 | 135 | 976.5 | 1180 ~ 1470 | 120.0 ~ 150.0 | 868.0 ~ 1085.0 | 00 | |
| | 30,22 | 46 | 1720 | 175 | 1265.8 | 1520 ~ 1910 | 155.0 ~ 195.0 | 1121.1 ~ 1410.4 | -0- | |
| 9.10 | derice 33 | 50 | 2210 | 225 | 1627.4 | 1960 ~ 2450 | 200.0 ~ 250.0 | 1446.6 ~ 1808.3 | | |
| 9 46 | 22 24 27 30 | 32 36 41 46 | 745 927 1320 1720 | 76 94.5 135 175 | 549.7 683.5 976.5 | 608 662 ~ 829 824 ~ 1030 1180 ~ 1470 1520 ~ 1910 1960 ~ | 67.5 ~ 84.5 84.0 ~ 105.0 120.0 ~ 150.0 155.0 ~ 195.0 200.0 ~ | 448.4 488.2 ~ 611.2 607.6 ~ 759.5 868.0 ~ 1085.0 1121.1 ~ 1410.4 1446.6 ~ |)(| |

d. federico 2022-09-06

36

39

42

55

60

65

2750

3280

4700

280

335

480

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2025.2

2423.1

3478

2450 ~

3040

2890~

3630

4250~51

50

250.0~

310.0

295.0~

370.0

434.0~525

.0



1808.3~

2242.2

2133.7~

2676.2

3145~3811

 Hydraulic hoses are tightened according to the torques given in the following table.

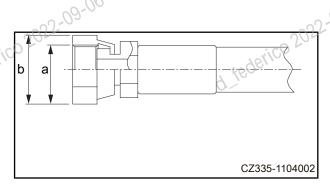


Fig.5-2

| Nominal | Square | | | Tighter | ning Torques | 3 | | |
|-------------------------|-----------------|--------------|--------------|---------|---------------|----------------|---------------------------|---------|
| Thread Number | Size (b) | | Target Value | es |)-06 Pe | 2-09-06 | | |
| (a) | (mm) | N·m | kgf∙m | lbft | N·m | kgf∙m | lbft 2 | 2-03 |
| 9/16- 18UNF | 19 | 44 | 4.5000 | 32.5 | 35 ~ 63 | 3.5 ~ 6.5 | 25.3 ~ 47 | |
| 11/16- 16UN | 22 | 74 | 7.5 | 54.2 | 54 ~ 93 | 5.5 ~ 9.5 | 39.8 ~ 68.7 | • |
| 13/16- 16UN | 27 | 103 | 10.5 | 75.9 | 84 ~ 132 | 8.5 ~ 13.5 | 61.5 ~ 97.6 | • |
| 1-14UNS | 32 | 157 | 16.0 | 115.7 | 128 ~ 186 | 13.0 ~ 19.0 | 94 ~ 137.4 | • |
| 13/16- 12UN | 36 | 216 | 22.0 | 159.1 | 177 ~ 245 | 18.0 ~ 25.0 | 130.2 ~ 180.8 | 06 |
| ☆1 -7/16 - 12UN - 2B | 22-09-00 | 215 | 22.0 | 159.1 | 176 ~ 234 | 18.0 ~ 24.0 | 180.8 130.2 ~ 180.8 | 2-09-00 |
| NOTE: | ked with * is u | and for time | d fede | | a af tha audi | d. | tederico | • |

NOTE:

The item marked with * is used for tightening the hose on top of the swivel joint.

5.7 Safety Critical Parts

- To ensure safety when operating or driving the machine, the user of the machine shall carry out regular maintenance. In addition, the user shall also replace the parts listed in the table in order to further improve safety condition. These parts are closely related to safety and fire prevention.
- Safety critical parts may easily wear or deteriorate due to material change as time passes and it is hard to judge their
- If these parts show signs of abnormality before its scheduled replacement, they must be repaired or replaced immediately.
- If the hose clamps show any deterioration, such as deforming or cracking, replace the clamps at the same time as the hoses.
- O-rings, gaskets and other such parts shall also be replaced when replacing hoses.
- Consult Sany dealer to replace the safety critical parts.

d federico 2022-09-06

conditions through regular maintenance.

These parts shall be replaced as scheduled regardless of their conditions, which can effectively guarantee the functions of these parts.

| No. | Safety critical parts for periodic | Quantity | Frequency |
|----------|--|----------|---|
| 1101 | replacement | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| 1 | Fuel hose (fuel tank - primary filter) | 1 | |
| 2 | Fuel hose(primary filter - pump) | 1 | |
| 3 09-0 | Fuel hose(pump – Secondary filter) | 1 | 0.09-0 |
| 2422 | Fuel hose(Secondary filter - engine) | 1 | d_federico 2022-09-0 |
| derice 5 | Fuel hose (engine- radiator) | 1 | tederico |
| 6 | Fuel hose (radiator -fuel tank) | 1 | 9.10 |
| 7 | Pump outlet hose (pump - control valve) | 2 | |
| 8 | Work equipment hose (boom cylinder oil inlet) | 4 | |
| 9 | Work equipment hose (Bucket cylinder line - boom root) | 2 | Every 2 years or |
| 10 | Work equipment hose (bucket cylinder oil inlet) | 2 | 4000 hours, |
| 11 202 | Work equipment hose (arm cylinder line - boom root) | 2 | first. |
| 12 | Work equipment hose (arm cylinder oil inlet) | 2 | whichever occurs first. |
| 13 | Swing drive hose (swing motor oil inlet) | 2 | |
| 14 | Main oil suction hose | 1 | |
| 15 | Travel control hose (control valve - swivel joint) | 2 | |
| 16 | Travel control hose (swivel joint - travel motor) | 2 | |
| 17 | Pump pressure hose | 1 | |
| 18 .09-1 | Accumulator (control oil) | 3 | 03-09-0 |
| 19 | High-pressure tube clamps | 1 | Every 8000 hours |
| 20 | Seat belt | 1 | Every 3 years |

5.8 Maintenance Schedule

If your machine is equipped with hydraulic breaker, the maintenance schedule for some parts may vary. For more information and proper maintenance, see "Hydraulic oil and filter - change/ replace"

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| | Maintenance schedule list | 3022-0 |
|------|--|------------|
| 60 | Every 250 service hours | 9 Jegetico |
| 9 16 | Every 250 service hours Check and tighten the nut of wheel | |
| | | |
| | Check and tighten the nut of transmission axle | |
| | Bucket - replace | |
| | Bucket tips - replace | |
| | Bucket clearance - adjust | 5-28 |
| | Window washer fluid level - check/fill | |
| | Refrigerant level - check | 5-30 |
| | Bucket tips - replace | 5-26 |
| | Every 100 service hours | 1,100 20 L |
| 4 46 | Refrigerant level - check Bucket tips - replace Every 100 service hours Lubrication | 5-34 |
| 0. | Blade lubrication | 5-37 |
| | Every 250 service hours | |
| | Air filter element - inspect/clean/replace | 5-42 |
| | Compressor belt tension - inspect/adjust | 5-45 |
| | Check the vehicle axle and gearbox ,oil level, add oil and check the from oil | |
| | Lubricate the transmission shaft | 5-49 |
| | Lubricate front axle oscillating shaft | 5-49 |
| | Lubricate front axle oscillating shaft | 5-50 |
| 4.5 | Every 500 service hours | dericoso |
| 9-16 | Swing bearing - lubricate | 5-51 |
| | Engine pan oil and filter element - change/replace | 5-52 |
| | Check the height of the grease in the rotating pinino and add grease | 5-53 |
| | Primary fuel filter element - replace | 5-55 |
| | Secondary fuel filter element - replace | 5-57 |
| | Radiator and oil cooler fins - inspect/clean | 5-59 |
| | Air conditioner fresh air/recirculation filter - clean | 5-61 |
| | Swing drive oil level - check/fill. | |
| | Every 1000 service hours | 2022-01 |
| | Every 1000 service hours Hydraulic oil return filter element - replace | 5-65 |
| 9 16 | Swing drive oil - change | 5-67 |
| | Cab door lock and front window lock catch - inspect/tighten | |



| 20-06 | 00-06 |
|---|-------|
| Cab door hinge and front window slide rail - inspect/add grease | 2-05 |
| Windshield wiper arm nut - Inspect/tighten5-70 | |
| Engine exhaust pipe clamps - check | - |
| Fan belt tension - check/replace5-70 | - |
| Nitrogen pressure in accumulator (breaker) - check | |
| Breather valve - service5-71 | |
| Every 2000 service hours | |
| Hydraulic oil suction filter element clean/replace5-72 | |
| Check the nitrogen pressure in the accumulator | |
| Cooling system interior - clean | 00.06 |
| Alternator - inspect | 2-09 |
| Cooling system interior - clean | |
| Every 4000 service hours | |
| Water pump - inspect5-78 | |
| Start motor - check | |
| Accumulator - replace | |
| High-pressure tube clamps and rubber - check Fig. 55-81 | |
| Compressor working condition - inspect | |
| Every 8000 service hours | |
| High-pressure tube clamps - replace | 00.06 |
| Every 10000 service hours | 5-00 |
| High-pressure tube clamps - replace 5-82 Every 10000 service hours 5.9 Maintenance Procedures | |

5.9 Maintenance Procedures

5.9.1 Initial 50 hours of operation (only the first 50 hours)

The following maintenance is to be conducted after the initial 50 hours of operation on a new machine.

- Engine oil and engine oil filter element Replace. For detailed information, see "Every 500 service hours".
- Fuel filter element Replace. For detailed information, see "Every 500 service hours". d federico 2022-09 d federico 2022-09.



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5.9.2 If required

ico 2022-09-06 5.9.2.1 Check and tighten the nut of wheel

It will be dangerous to operate the machine if the nuts are loose. So it should tighten the nuts

Tightening:

Tightened torque:650±50N.m

Tightening sequence:

As the sequence of right figure tighten the torque 9 tegerico

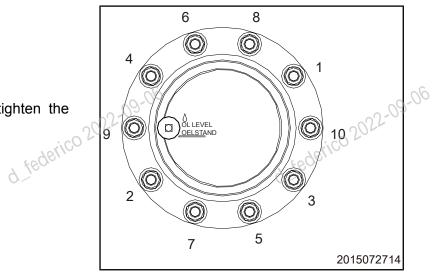


Fig.5-3

5.9.2.2 Check and tighten the nut of transmission axle

It will make strange noise to operate the machine if the nuts are loose. So it should tighten the nuts.

It can't use the wrench to operate the nuts on the top of transmission axle because of no space. It need travel for a while and tighten.

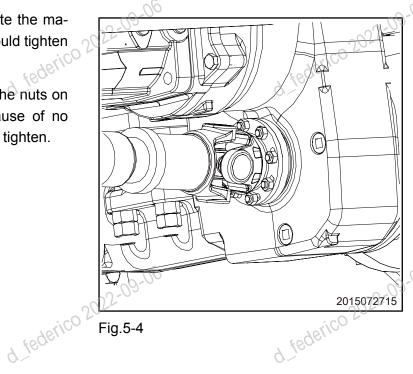


Fig.5-4



5.9.2.3 Bucket - replace

WARNING

- Driving a pin shaft with a hammer can cause flying metal pieces that could lead to severe injury. Wear goggles, safety hat, protective gloves and other protective gears during such an operation.
- If the pin shaft is hit with strong force, it could fly out and cause personal injury.
- moving the pin shaft. Do not place your foot under the bucket when working at side. · Do not stand behind the bucket when re-
- Do not get your finger pinched while removing or installing the pin shaft.
- Do not put your finger into the pin hole while aligning it.
- 1. Park the machine on a hard and level ground and lower the bucket until it is just in contact with the ground. If you lower the bucket to ground with greater force, the force against the pin will increase, making it difficult to remove the pin.

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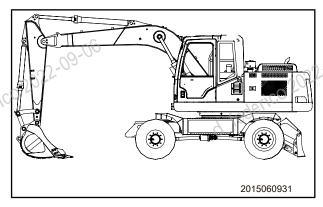


Fig.5-5

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2. Remove the nuts on the bolts of the retaining plate of arm pin (A) and link pin (B). Remove the bolts and take out arm pin (A) and link pin (B). Remove the bucket.

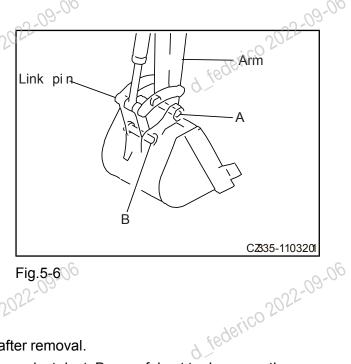


Fig.5-60

- NOTE: Make sure the pin roll is free from mud or sand after removal.
- Both ends of the bushing are installed with seals against dust. Be careful not to dam- age them.
 - 3. Align the arm with the pin hole (1) of the replacement bucket as well as the link rod with the hole (2). Insert the greased pin rolls (A) and (B) into hole (1) and hole (2) respectively.

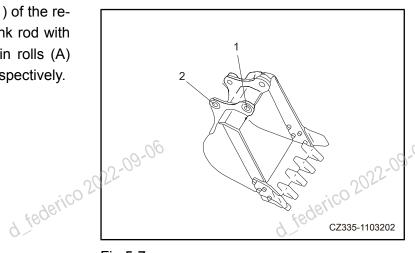


Fig.5-7

NOTE:

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When mounting the bucket, place the O-ring [3] of bucket to the position, as shown in the right illustration. After the pin roll is inserted, align it to the standard notch.

4. Reinstall the nuts and bolts onto the plate d federico 2022 retaining the pin rolls. Add grease to the pin d federico 25

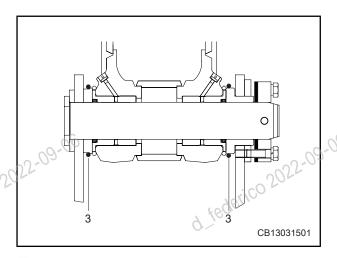


Fig.5-8



Inject sufficient amount of grease till the grease is squeezed out of the end face.

Replace any brot grease is squeezed out of the end face.

bucket. The use of broken seals could allow sand or dust to penetrate through to the pin roll and cause its abnormal wear.

5.9.2.4 Bucket tips - replace

Replace the bucket tip before the tip adapter is worn.

- Operating the work equipment by mistake is very dangerous when replacing the tips.
- The pin may fly out can cause personal injury if too much force is applied onto it. Make sure that nobody is in the surrounding area.
- · Wear safety goggles, gloves and other personal protective gears.
- 1. Place a block beneath the bucket and keep the bucket bottom level. d federico

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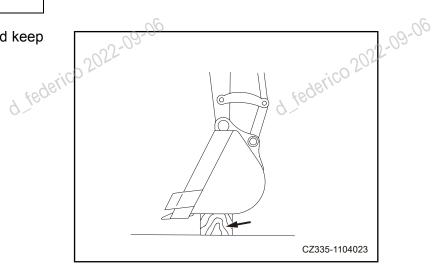


Fig.5-9

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and the hydraulic lockout control lever is in the LOCKED position 2. Make sure the work equipment is stable the LOCKED position.

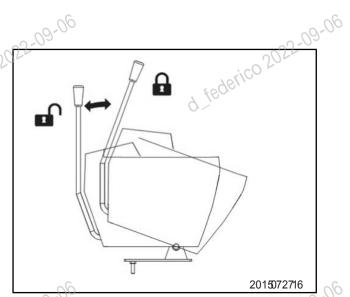
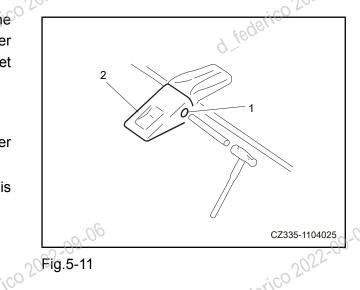


Fig.5-10

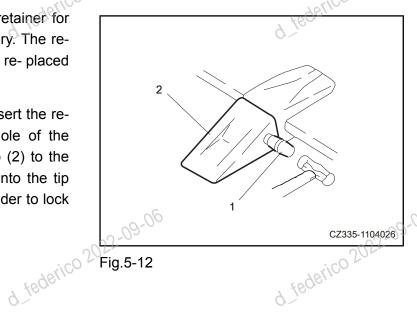
2022-09-06 3. Place a metal stick against one end of the pin (1) and hammer the metal stick in or- der to drive the pin (1) out and remove the bucket tip (2).

NOTE:

- The metal stick shall have a smaller diameter than the pin.
- If the tip cannot be removed safely in this way, consult Sany dealer for replacement.



- rico 2022-09-06 4. Remove the tip and check the retainer for any damage. Replace it if necessary. The retainers and tips worn short must be re-placed with new ones.
- 5. Clean the installation surface. Insert the retainer spring into the mounting hole of the adapter. Mount the new bucket tip (2) to the adapter. Push part of the pin (1) into the tip and hammer it in completely in or- der to lock the bucket tip onto its adapter. d federico 2022



5.9.2.5 Bucket clearance - adjust

WARNING

- · Operating the work equipment by mis-take is dangerous when adjusting buck- et clearance.
- Position the work equipment securely. Shut down the engine and place the hydraulic lockout control to the LOCKED position.

all rico 2022-09-06 The bucket clearance must be readjusted after your machine has been operated for a period of time. When the clearance is excessively large or small, it is necessary to install or re- move the shims.

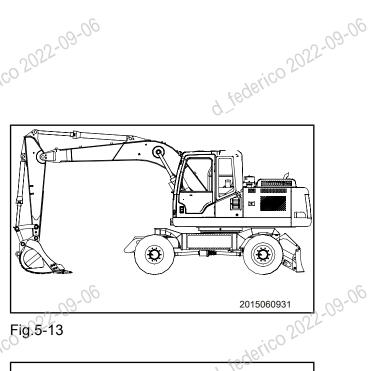
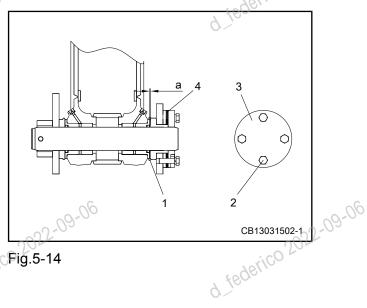


Fig.5-13

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- 2derico 2022-09-06 1. Park your machine on a level ground. Lower the bucket to the ground, in an attitude shown in the right illustration.
- 2. Run the engine at low speed. Fix the bucket on the ground. Slowly turn the upper structure counterclockwise till the inside of the left side of the bucket contacts closely with the left end surface of the arm.
- d federic Fig. 5-14 3. Shut off the engine. Place the lockout control lever to the LOCKED position.





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- ance (a). It is easy to obtain accurate result with a feeler gauge. with a feeler gauge.
 - 5. Loosen the four plate-mounting bolts (2) in order to detach the plate (3). Each shim has an opening, so it is unnecessary to re-move the bolt when making adjustment.
 - 6. Remove the spacer equivalent to the measured clearance (a).

[EXAMPLE:]

If the clearance is 3 mm (0.118 in), remove two 1.0 mm (0.039 in) spacers and one 0.5 mm (0.02 in) spacer, or one 2.0 mm (0.078 in) spacer and one 0.5 mm (0.02 in) spacer. The clearance is reduced to 0.5 mm (0.02 in). The spacers (4) include three types, 2.0 mm {0.078 in}, 1.0 mm (0.039 in) and 0.5 mm (0.02 in). When the clearance (a) is less than one spacer, no adjustment shall be made.

7. Tighten the four bolts (2).

5.9.2.6 Window washer fluid level - check/fill

When the solvent level in the washer reservoir is low, air or foam will be sprayed onto the front window. Refill the washer reservoir when solvent level is low.

- 1. Open the left access door of the machine and check the solvent level in the washer reservoir.
- 2. Open the cap on the reservoir and fill it with washer solvent. Cover the reservoir.
- d federico 2022-09 3. Press the washer switch and check the function of the windshield washer.

NOTE:

Be careful not to allow dirt or dust get into the reservoir when adding washer solvent.

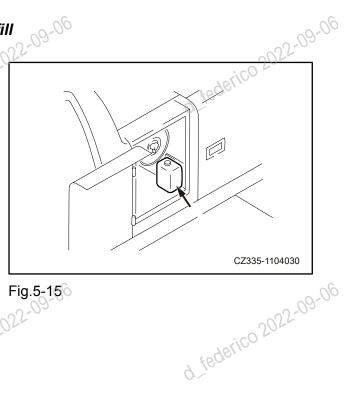


Fig.5-15



Select different mixture ratio according to ambient temperature. Mix pure washer solvent and water according to

| Operating Regions | Mixture Ratio | Temperature | |
|----------------------------------|---------------------|-----------------------|-------------------|
| General | 1:2 | - 10℃(14 °F) | |
| Cold regions in winter | 1:1 | - 20°C (- 4 °F) | C |
| Extremely cold regions in winter | Pure washer solvent | - 30°C (- 22 °F) | Jerico 2022-09-06 |
| NOTE : | | 9 180 | 26. |



NOTE: There are two types of detergent: one for -10°C {4°F} (common) and one for -30°C {-22°F} (frigid regions), which can be selected according to the operating region.

5.9.2.7 Refrigerant level - check

1.

WARNING

- · Refrigerant getting into eyes may cause blindness. It may cause frostbite in splashed on your skin.
- · Keep any naked fire away from the leaking position of refrigerant gas.

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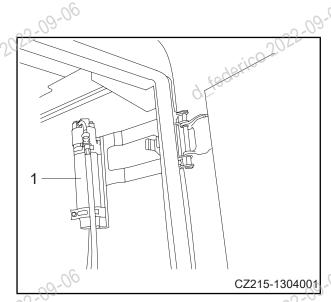
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Insufficient refrigerant (R134a) will severely impair the cooling performance. Running the air conditioner when refrigerant level is low may cause damage to the compressor. Operate the air conditioner

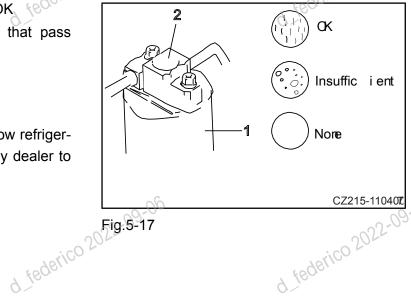
Operate the air conditioner for strong refrigeration when the engine is running at a high speed. Observe through the glass (2) on the condenser reservoir (1) in order to inspect the condition of refrigerant gas flowing to the tube.



- Refrigerant flows without foam: OK
 - Refrigerant flow contains foam that pass continuously: Insufficient
 - Colorless and transparent: None

NOTE:

The existence of foams indicates low refrigerant level. Please consult your Sany dealer to add refrigerant. d federico 2022-09-06



Inspection during idle period

When the air conditioner will not be used for a long period of time, the air conditioner shall be operated for 3-4 minutes each month in order to lubricate the compressor components.







Air conditioner components inspection and maintenance schedule

| Components | Description | edule Service Interval | |
|--|--|----------------------------------|--|
| Refrigerant (gas) | Refilling | Twice a year (spring and autumn) | |
| | Tube connections and internal leakage of parts and components | Daily | |
| Condenser | Radiator fins plugged | Every 500 hours | |
| Compressor | Function | Every 4000 hours | |
| V-belt 2222-09-06 | Loose and bent | Every 250 hours | |
| | Deterioration, wear, scratch and cracking | Every 250 hours When necessary | |
| | Noise, odd smell or abnormal heat | When necessary | |
| Fan motor and fan | Function (check for abnormal noise) | When necessary | |
| Air conditioner air flow switch | Air flow control switch and switching function | Daily | |
| Control unit | Function (make sure the function is normal) | When necessary | |
| Joining bolts | Loose connections and loose or detached nuts and bolts | Every 6 months | |
| Connection tubes | Installation condition, loose connections, air leakage or any damage | When necessary | |
| Reservoir dryer temperature difference | Temperature difference indicates a blocked dryer. | Every year | |

5.9.2.8 Ceiling window gas spring - inspect

WARNING

- The gas spring contains high-pressure nitrogen. Wrong operation can cause explosion and result in machine dam- age and personal injury or death.
- Keep the gas spring away from fire.
- Do not drill or weld on the gas spring.
- d. federico 2022-09-06 • Do not hammer the gas spring or ex- pose it under any impact.



The gas springs are located on the top of cab (at both the left and right sides).

Contact with Sany dealer for inspection, repair and replacement such as bellows:

- The ceiling window can't open easily.
- The ceiling window can't remain open.
- Oil or gas leaks from the gas spring.

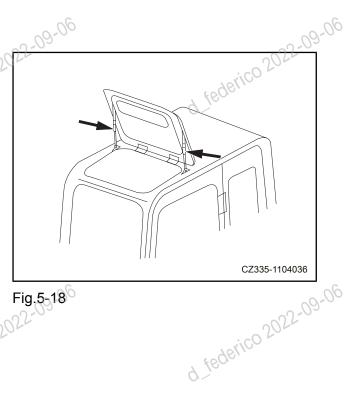


Fig.5-18

How to release pressure in the hydraulic eircuit teder

WARNING

- · The hydraulic circuit is always under pressure. Release the pressure in hydraulic circuit when checking or replacing the hoses or fittings.
- When the engine stopped, oil and engine's components are still hot and they can
- Oil may squirt out when remove the oil filler cap. Therefore, slowly remove the order to release the internal pressure.



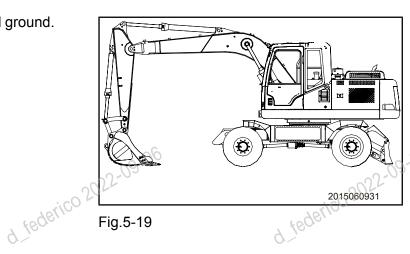


Fig.5-19



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- 2. Turn the start switch to ON position within 15 seconds after engine shutdown and move the hydraulic control lever to FREE position.
- 3. Move the joysticks and the travel control levers in all directions to relieve the internal pressure.
- 4. Remove the butterfly nut (1) on the breather valve of the hydraulic tank and press the air vent to relieve the internal pressure.

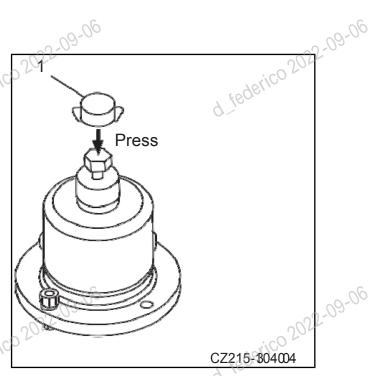


Fig.5-20

5.9.3 Inspection before the Startup

For more information about the following items, see "Inspection before the startup".

- Drain the water and sediment from the fuel tank.
- Check the water separator for water and sediment. Drain the water.
- Check the oil level in the hydraulic tank and add oil.
- Check the oil level in the engine oil pan and add oil.
 Check the wires.
 Check the fuel level and add fuel.
 Check the work lamp switch.

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- Check the function of the horn.

5.9.4 Every 100 service hours

5.9.4.1 Lubrication

A CAUTION

- If the lubricated components produce abnormal noise, additional lubrication is required besides regular maintenance.
- After operating in water, the machine's wet pin rolls are to be greased.

1. Adjust the machine to a to-be-greased position, lower the work equipment to the ground and shut down the engine.

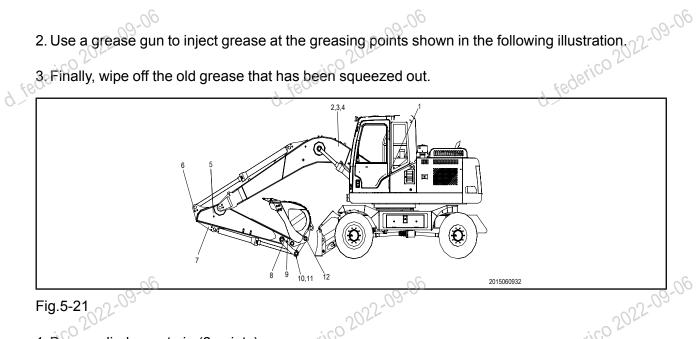
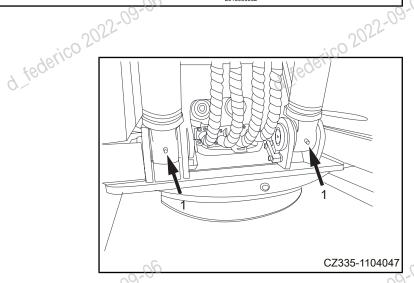
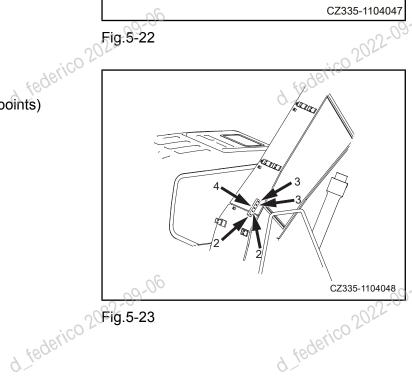


Fig.5-21

1 Boom cylinder root pin (2 points)



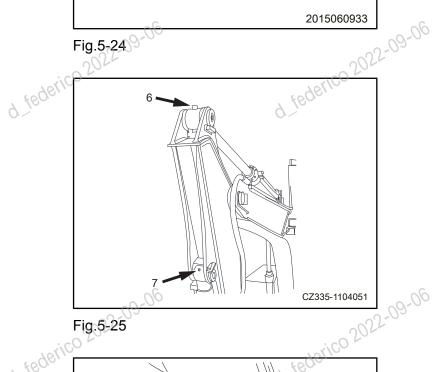
- ,2022-09-06 2. Boom root pin (2 points)
- 3. Boom cylinder piston rod end (2 points)
- 4. Arm cylinder root pin (1 point)



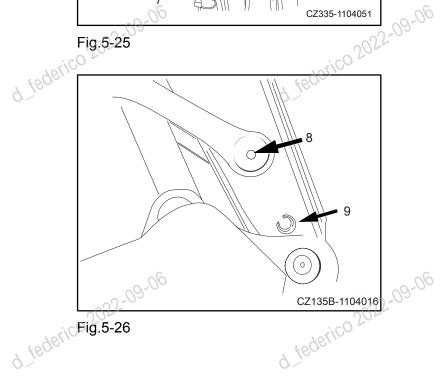
5. Boom-arm joining pin (2 points) d federico

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- 6. Arm cylinder piston rod end (1 point)
- 7. Bucket cylinder root pin (1 point)



8. Arm-rod joining pin (1 point)



- 9. Arm-Bucket joining pin (1 point)
- 10.Rod joining pin (2)
 - 11.cylinder piston rod end (1)
 - 12.Bucket-rod joining pin (1)

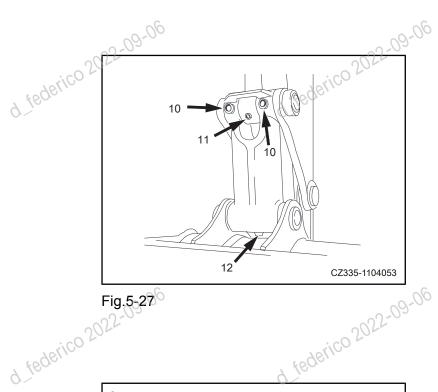


Fig.5-27

5.9.4.2 Blade lubrication

- 1 : Lift up the cylinder guard(2).
- 2: Pin (1) inserts into the fixed hole.

Note: the pin need insert fully to prevent the cylinder guard dropped.

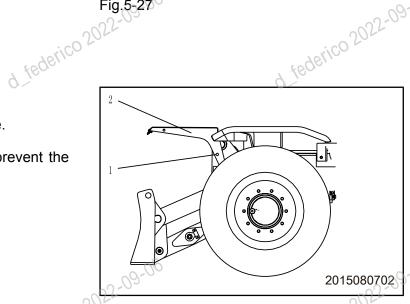


Fig.5-28

d. federico 2022-09-06 Blade lubrication points fulfill the grease. (12 points)

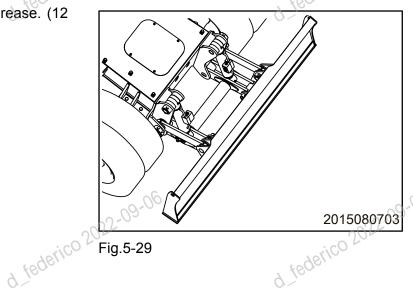


Fig.5-29

First 250 hours of maintenance

Replace the front and rear wheel axle oil

1: Located the machine on the horizontal ground.

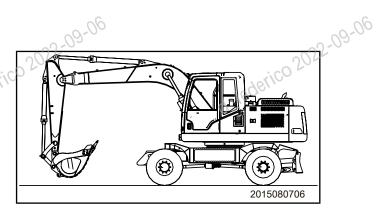


Fig.5-30

2 : Need to clean the surface of the wheel when open the plug.

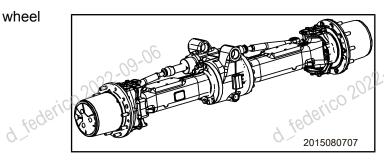


Fig.5-31

3 : Rotate the wheel and let the plug on the top. (12:00 direction)

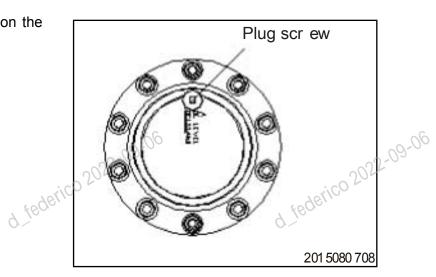


Fig.5-32

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- 4 : Slowly unscrew the plug to release the internal pressure and pay attention to prevent the internal high pressure. the internal high pressure liquid ejected.
 - 5: Rotate the wheel and let the plug on the bottom(6:00 direction). Then release the internal lubrication.

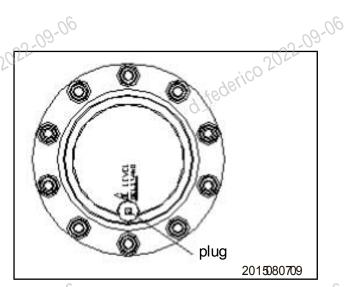


Fig.5-33

- 6: Locate the oil port to the horizontal position after the lubricating oil drained off. Then fill the lubricating oil to the baseline.
 - 7 : After standing a few minutes and oil level is stable, tighten the plug.

Plug tightening torque: 50 N.m

Note:

- 1 : Turn on the switch to the parking(P) model, when open the plug.
- 2 : Can't operate till it cools down because operation makes heat.
- 3: Lifting up the tire and releasing the brake, it can rotate the wheels.

Replace the axle differential gear oil

1: Locate the machine in a horizontal position.

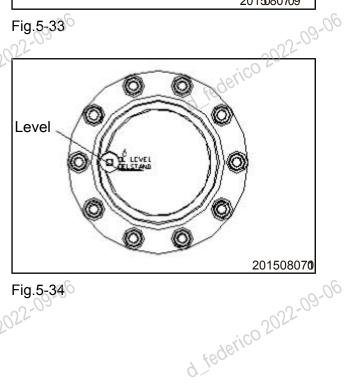
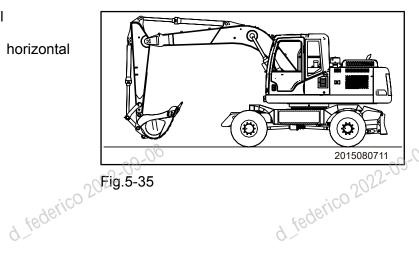


Fig.5-34



2 : Clean up the surface when open the plug. d federica

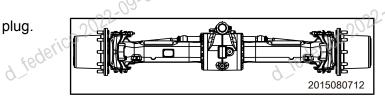
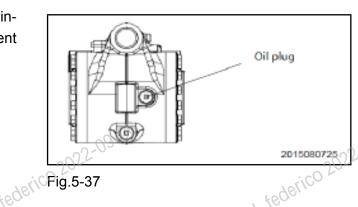


Fig.5-36

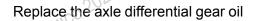
3 : Slowly unscrew the plug to release the internal pressure and pay attention to prevent the internal high pressure liquid ejected.





- 4: Unscrew oil drain plug below and drain off the differential oil.
- 5: Tighten the drain plug and fill the gear oil to the height of plug opening after the gear oil is drained.
- 6 : After standing a few minutes and oil level is stable, tighten the plug.

Plug tightening torque 50 N.m.



1. Locate the machine in a horizontal position.

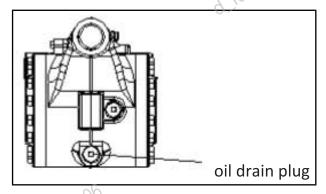


Fig.5-38

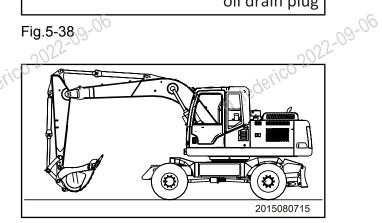


Fig.5-39





2 : Clean up the surface when open the plug. d federico

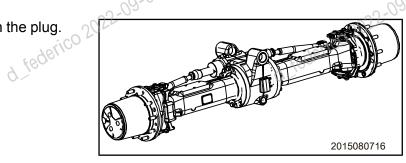


Fig.5-40

3 : Slowly unscrew the plug to release the internal pressure and pay attention to prevent the internal high pressure liquid ejected. d federico 2022-09-

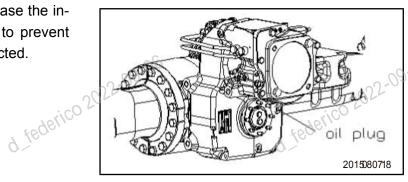
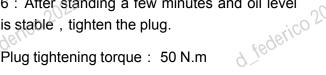


Fig.5-41

- 4: Unscrew oil drain plug below and drain off the oil of transmission.
- 5: Tighten the drain plug and fill the transmission oil to the height of plug opening after the transmission oil is drained.
- 6 : After standing a few minutes and oil level is stable, tighten the plug.



Plug tightening torque: 50 N.m

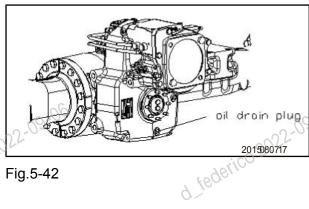


Fig.5-42

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5.9.5 Every 250 service hours

ico 2022-09-06 5.9.5.1 Air filter element - inspect/clean/replace

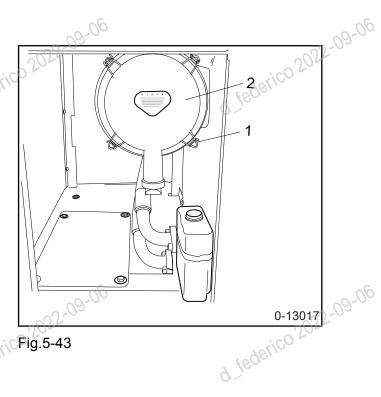
CAUTION

- Dust may enter the engine when the filter element is checked or replaced with the engine running. To protect the engine, shut it down before conducting this job.
- The sealing rubber of the end cap must be held tightly against the filter.
- Jerico 2022-09-06 • Don't take out the inner air filter to clean. Dust will come into the intake system and cause the engine failure.
- Replace the inner and outer filter together.
- · Use compressed air to clean the filter. Please wear the eye-glasses, dust mask or protective device.
- Don't be forced to pull out the outer filter When standing height or foothold to operate the machine. Be careful not to fall down due to the reaction force when pulling out the outer filter.

Outer filter element - Clean and replace

- · Clean: Every 250 service hours or when the air cleaner clogging alarm appears.
- Replace: Every 12 months or when it has been cleaned for six times, whichever occurs first.

Open the rear-left access cover of the machine and loosen the clip or clasp (1) be- fore removing the cover (2).



d federic Fig. 5-43

5-42

d federico 2022-09-06



- 1. Hold the outer filter element (3), shake it slightly and turn it in both directions in order to pull it out.
 - 2. Check the inner filter element (4) to see if it displaces or tilts. Push it back to position in case of displacement or tilting.
 - 3. Cover the inner element (4) with a piece of clean cloth to avoid entering of dirt.
 - 4. Clean the dirt inside the cover and the inside (5).
 - 5. Blow the outer filter element with compressed air (less than 0.2MPa) along the inside and outside pleats.

NOTE:

- Do not tap the air filter element with any object when cleaning it.
- Do not use air filter elements with dam- aged pleats, gaskets or seals.
- Using a filter element that has been used for more than a year or an O-ring that has been cleaned could result failure. Never use them again,
 - 6. Use a light to illuminate the filter element. Replace the filter element in case of holes or reduced thickness found in the filter material.

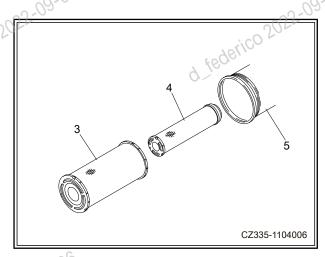


Fig.5-44

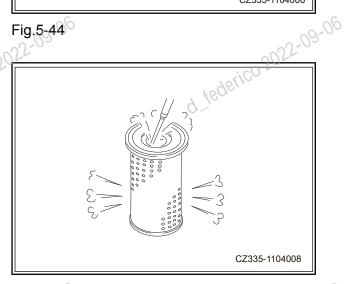
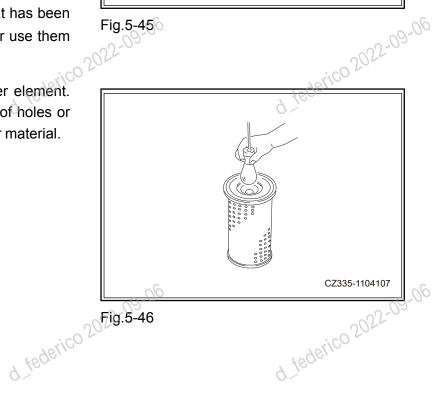


Fig.5-45



Replacement of the inner filter element

- 1. Remove the outer filter element (3) and then the inner filter element (4).
- 2. Cover the air connecting side with a piece of clean cloth to prevent dust form entering the filter element.
- 3. Clean the inside of the air cleaner body and then remove the covering cloth.
- 4. Place the new inner filter element (4) onto the connecting side.
- filter element straight forward into the air cleaner housing. You can half slightly to make the task easier.
- 6. Install the cover (2). Make sure the arrow mark points upward. Lock the clip (or clasp) (1). Check the gap between the housing and the cover. Reinstall the cover if the gap is excessive.

NOTE:

- Never use the inner filter element after cleaning it. Replace the inner filter element when the outer one is replaced.
- When the outer filter element and the cover have been installed, improper installation of the inner filter element could damage the outer element.
- Fake parts will allow dirt to pass through and damage the engine due to insufficient precision in the sealing area. Therefore, fake parts shall not be used under any d federico 2022-09-06 d.federico 2022-09-06

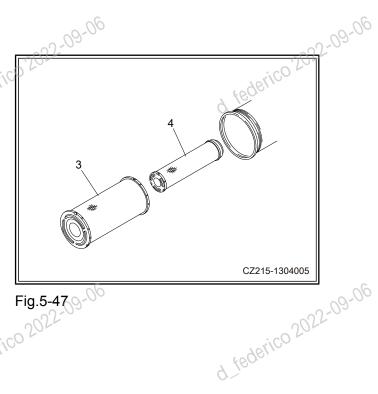


Fig.5-47

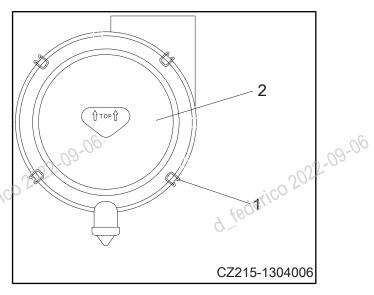


Fig.5-48



5.9.5.2 Compressor belt tension - inspect/adjust

Inspection

Press the middle of the belt between the drive pulley and the compressor pulley with your finger (about 58.8N {6kgf}).

Measure the deflection (A). Standard value of size A shall be 5-8mm {0.20-0.31in.}.

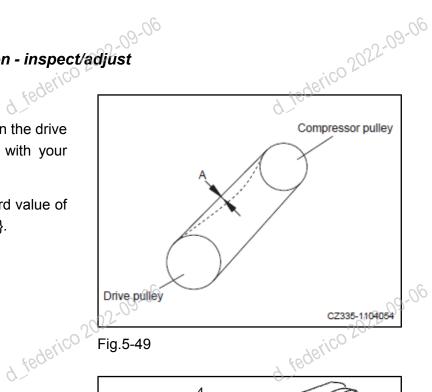


Fig.5-49

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- 1. Loosen the bolts (1) and (2).
- 2. Move the compressor (3) and its bracket (4) in order to adjust belt tension.
- 3. Tighten the bolt (1) and (2) after positioning the compressor (3).
- the belt 4. Check tension again after adjustment.

NOTE:

- Check for damaged pulleys and worn Vgroove and V-belt. In addition, make sure that the Vbelt must not rub against the bottom of the Vgroove.
- Consult Sany dealer to replace the belt timely in case of the following conditions.
 - The fan belt has been stretched and little federico 2022-09-06 margin is left for adjustment.
 - Cuts or cracks are found in the belt.
 - The belt skids or squeaks.
- A newly installed V-belt shall be readjusted after one hour of operation.

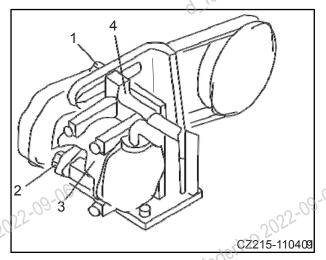


Fig.5-50



5.9.5.3 Check the vehicle axle and gearbox ,oil level, add oil and check the front and rear wheel axle oil

1: Locate the machine in a horizontal position.

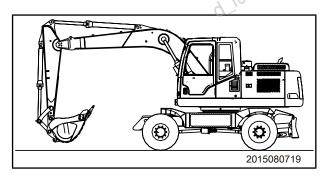


Fig.5-51

2 : Clean up the surface when open the plug.

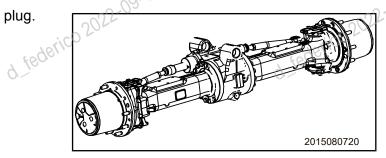


Fig.5-52

3: Rotate wheels to the top (12:00 direction).

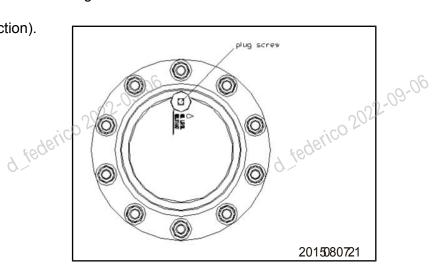


Fig.5-53

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d_federico 2022-09-06

- 4 : Slowly unscrew the plug to release the internal pressure and pay attention to prevent the internal high pressure liquid ejected.
 - 5 : Rotate the wheel as the counterclockwise and make the oil port to the horizontal position, then check the oil level. Fill the lubricating oil if it is lower than the baseline.
 - 6: Tightening the plug after checking.

Plug tightening torque: 50 N.m

- 1 : Turn on the switch to the parking(P) model, when open the plug.

 2 : Can't operate till it cools d
- operation makes heat.
- 3: Lifting up the tire and releasing the brake, it can rotate the wheels.

Replace the axle differential gear oil

1: Locate the machine in a horizontal d federico 2022-09-06 position.

2 : Clean up the surface when open the plug.

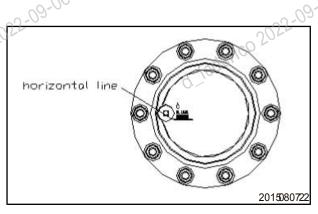


Fig.5-54

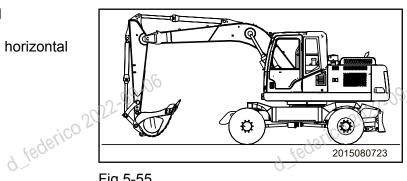


Fig.5-55

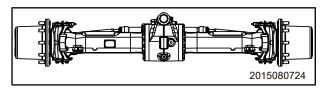


Fig.5-56

d federico 2022-09-06





- 3 : Slowly unscrew the plug to release the internal pressure and pay attention to prevent the internal high pressure liquid ejected.
- 4: Check the oil level and fill the lubricating oil If it is lower than the oil port.
- 5: Tightening the plug after checking.

Plug tightening torque: 50 N.m

Replace the gearbox oil

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d federico 2022-09-1: Locate the machine in a horizontal

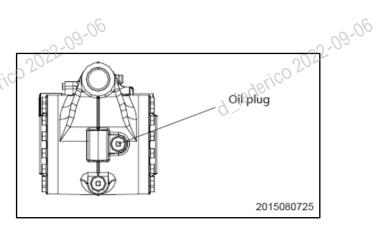


Fig.5-57

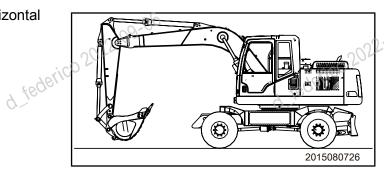


Fig.5-58



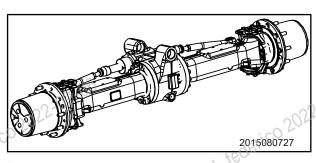
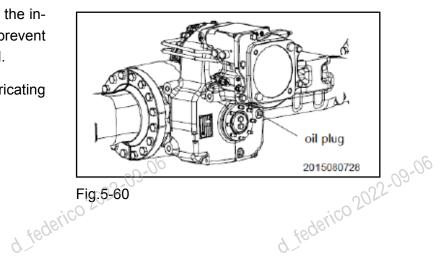


Fig.5-59

- 3 : Slowly unscrew the plug to release the internal pressure and pay attention to prevent the internal high pressure liquid ejected.
- 4: Check the oil level and fill the lubricating oil If it is lower than the oil port.
- 5: Tightening the plug after checking.

Plug tightening torque: 50 N.m d federico 2022



5.9.5.4 Lubricate the transmission shaft The front transmission shaft

- The front transmission shaft (3 points).
 - The rear transmission shaft (3 points).

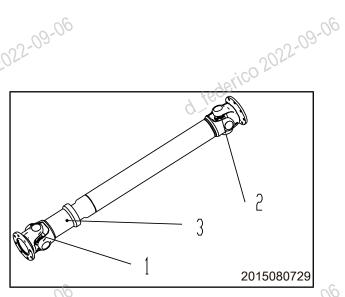


Fig.5-61

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Note: the drive shaft need to turn to the right position in order to facilitate the insertion of grease gun.

• Transmission shaft support (1 point).

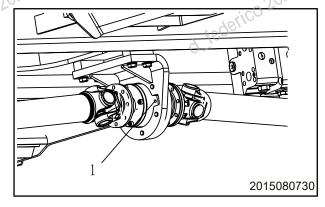
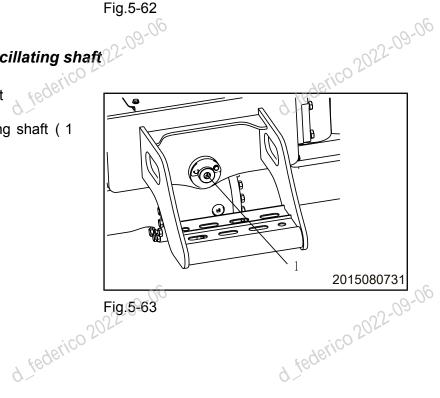


Fig.5-62

5.9.5.5 Lubricate front axle oscillating shaft

Lubricate front axle oscillating shaft

 Front end of front axle oscillating shaft (1 Point).



Rear end of front axle oscillating shaft (1 d federic Point).

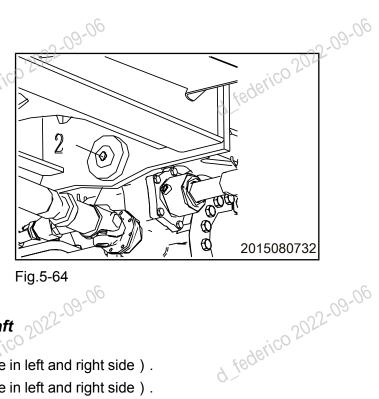


Fig.5-64

5.9.5.6 Lubricate front axle oscillating shaft

- Upper hinge point of front axle drive (each one in left and right side) .
- Lower hinge point of front axle drive (each one in left and right side) .

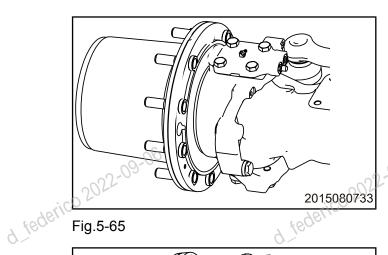
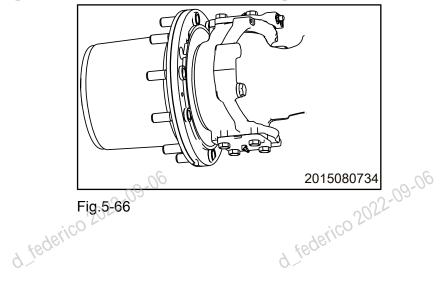


Fig.5-65



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5.9.6 Every 500 service hours

5.9.6.1 Introduction

d_federico 2022-09-06 The 100-hour and 250-hour services shall be carried out in the meantime.

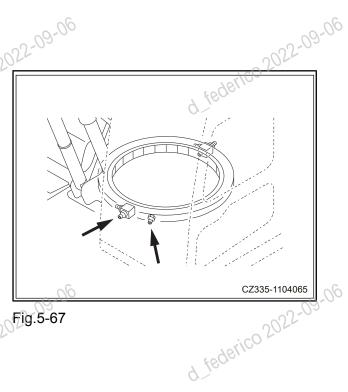
5.9.6.2 Swing bearing - lubricate

WARNING

- Applying grease to the swing bearing is dangerous. Do not swing the upper struc-
- 1. Lower the work equipment to the ground and then shut down the engine D' draulic lockout control lever to the LOCKED position.
- 2. Add grease through the two grease fittings while the upper structure is kept still.
- 3. Start the engine, move the lockout control lever to the FREE position, and raise the Fig. 5-67 bucket 20-30 mm above the ground. Swing the upper structure by 90°.
- 4. Repeat steps 1 through 3 and add grease.

NOTE:

- The grease is used to prevent distortion and noise of joints.
- It is necessary to add grease to any component that appears inflexible or noisy after operation for a long period.
- Wipe off the used grease that has been squeezed out when greasing.
- Make sure to wipe off all used grease in different locations. Using a grease that has been contaminated by sand or debris can lead to wear of rotating components.





5.9.6.3 Engine pan oil and filter element - change/replace

WARNING

- When the engine has just b een stopped, the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.
- The volume of the Oil sump. See the volume table in page 5-11.
- Prepare a filter spanner.
- 1. Stop the machine and place the hydraulic lockout control to the LOCKED position.
- 2. Remove the bottom cover of the machine. Place a container under the drain valve (P). Hold a piece of cloth between the valve and the vessel. Open the drain valve slow- ly and discharge oil.

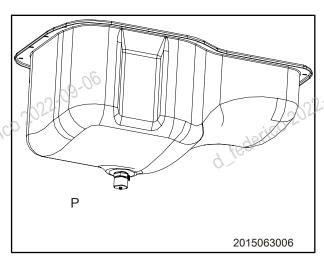


Fig.5-68

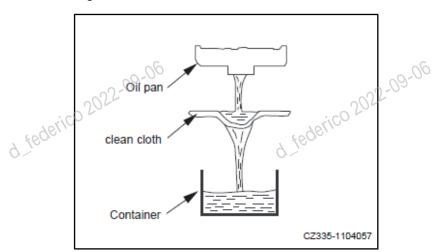


Fig.5-69

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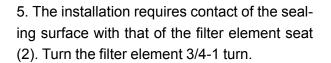
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- Open the right access door of the machine and turn the filter element (1) leftward with filter element spanner in order to disassemble the filter element.
 - 4. Clean the filter element seat (2). Fill the new filter element with clean engine oil. Apply engine oil (or a film of grease) to the filter sealing surface and the threads be- fore installing the filter element to its seat.

NOTE:

Check the filter element seat (2) for presence of used seal. The presence of used seal in the filter element seat (2) can cause oil leakage.



- 6. Open the engine hood and add engine oil through the filler. After 15 minutes, check if oil level is between the H and L marks on the dipstick.
- 7. Run the engine idly for a short time and then turn off the engine. Check again the oil level, which shall be between the H and L marks of the dipstick. For more information, see "Oil level in oil pan check/add" on page 4-11.
 - 8. Reinstall the bottom cover.

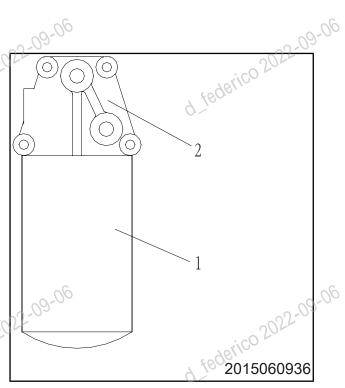


Fig.5-70

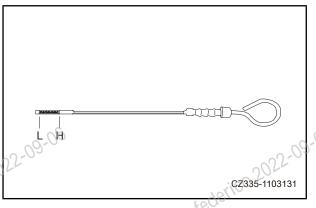


Fig.5-71

5.9.6.4 Check the height of the grease in the rotating pinino and add grease

Prepare a measurement

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1. Remove the nuts (1) (2 pcs) from the swing frame and the lower cap

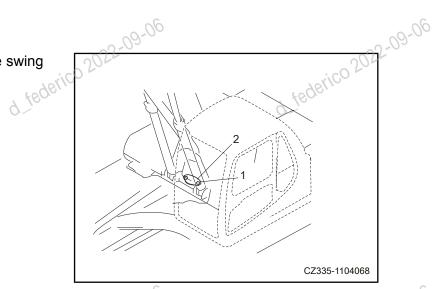


Fig.5-72

- 2. The ruler (3) inserted into the grease by checking and adjustment holes , check the pinion through parts of grease [S] height which should be at least 14 mm (0.6 in). Fill the grease if lower than it.
- 3. Check whether the grease is milky white. It has been contaminated if it shows milky white. Please contact Sany authorized dealers to replace the grease.

The total amount of grease :10L (2.6 US gal)

4. Install the tap (2) by bolts (1).

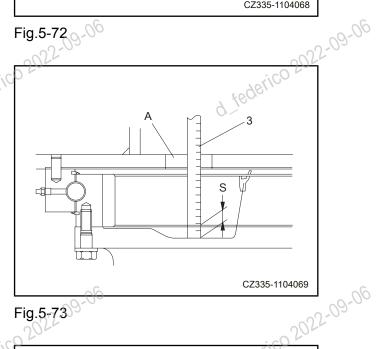
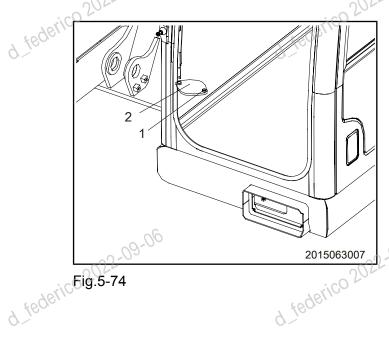


Fig.5-73



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5.9.6.5 Primary fuel filter element - replace

WARNING

- Do not replace the filter immediately after the engine is shut off, as all parts are still hot. Wait for the parts to cool down before you proceed.
- High pressure is generated in the fuel system when the engine is running.
- Wait at least 30 seconds after engine shutdown and replace the filter when internal pressure drops to a safe level.
- Be away from fire sources.

NOTE:

- Sany genuine fuel filter element is a special filter of effective filtration. The filter element must be replaced with a genuine one.
- The use of other parts may allow dirt or debris to pass through and cause the spray system failure. Therefore, avoid using any substitutes.
- Prevent dirt from entering the fuel system during inspection and service. In case of any parts contaminated by dust, flush them clean with engine oil.
- Prepare a container to store the fuel drained.
- Prepare a filter spanner.
 - 1. Open the right access cover of the machine.
 - 2. Place a container under the primary fuel filter to collect the fuel drained.
 - 3. Loosen the drain valve (5), drain all water and sediment from the transparent cover (4), and remove the fuel accumulated in the filter element (3).

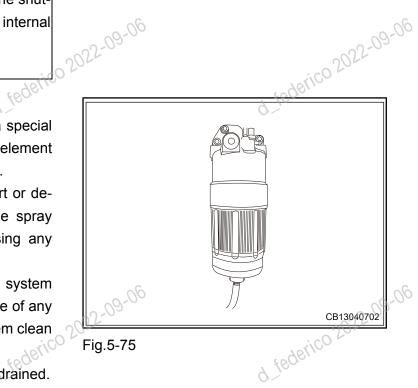


Fig.5-75

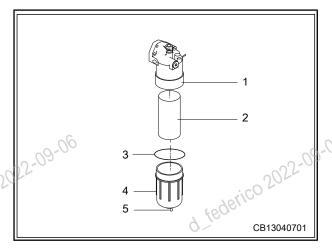


Fig.5-76



d. federico 2022-09-06 4. Turn the transparent cover (4) counterclockwise with a filter spanner to remove it. This cover can be used repeatedly.

5. Remove the old filter element. Clean the filter seat and replace the old filter element with a new one.

6. Replace the gasket (3) and install the transparent cover (4) onto the filter seat (1).

contact with that of the filter element before further tightening it by 1/4-1/2 turn.

NOTE:

Over tightened transparent cover will damage the O-ring and cause oil leakage. Insufficient tightening will allow oil to leak from the clearance of O-ring. To avoid such problems, the transparent cover must be tightened to specific torque.

d. federico 2022-09-06 8. Check the drainage(5) whether or not tightened firmly.

9. Finish the filter replacement.

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10. After replacing the filter element, clean up the leaked fuel. After turning on the power at least 30 seconds, start and run the engine at low idle for 10 minutes.

Check the filter- sealing surfaces and the transparent cover for fuel leakage. Check the tightening degree of the filter element when fuel leaks.

If the fuel still leaks, repeat the steps 1-7. Remove the filter element and replace it with a new filter element if any damage or foreign object is found on the sealing surface. d federico 29 d federico 2

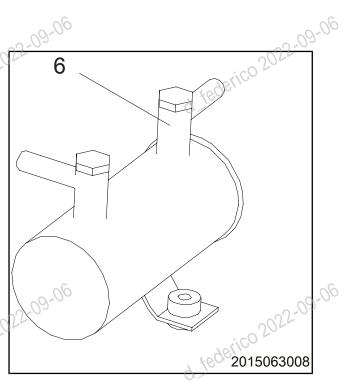


Fig.5-77

5.9.6.6 Secondary fuel filter element - replace

WARNING

- Do not replace the filter immediately after the engine is shut off, as all parts are still High pressure is generated in the fuel system when the engine is running hot. Wait for the parts to cool down before
- tem when the engine is running.
- Wait at least 30 seconds after engine shutdown and replace the filter when internal pressure drops to a safe level.
- Be away from fire sources.



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- Sany genuine fuel filter element is a special filter of effective filtration. The filter element must be replaced NOTE: 2022-09-06 filter of effective filtration. The filter element must be replaced with a genuine one.
- The use of other parts may allow dirt or debris to pass through and cause the spray system failure. Therefore, avoid using any substitutes.
- Prevent dirt from entering the fuel system during inspection and service. In case of any parts contaminated by dust, flush them clean with engine oil.
- Prepare a container to hold the fuel drained.
- Prepare a filter element spanner.
 - 1. Open the engine hood.
 - 2. Place a container under the filter element.
 - 3. Turn counterclockwise the filter cartridge (1) with the filter element spanner to remove it.
 - 4. Clean the filter element seat. Apply a film of oil to the surface of the new filter cartridge before mounting it to the filter element seat. d federico 2022

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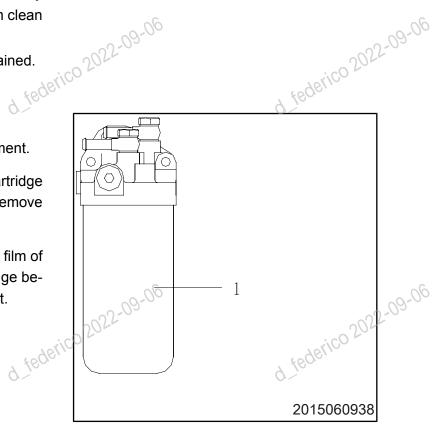


Fig.5-78

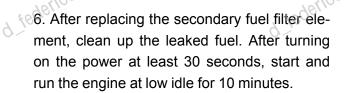
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- NOTE 222-09-06
- Do not fill the new filter cartridge with fuel.

 Remove the cover (B) and incording cartridge cartridge.
 - 5. During installation, tighten the filter cartridge until its sealing surface contacts that of the filter seat. Then, tighten it further by 3/4 turn. If the filter cartridge is over-tightened, the seals may be broken and oil leakage could result. If the cartridge is too loose, fuel will leak from the sealing location. Therefore, the filter element must be tightened to a suitable torque.



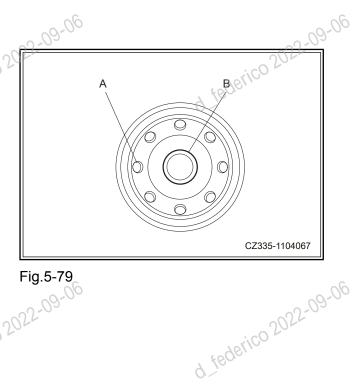


Fig.5-79

5.9.6.7 Radiator and oil cooler fins - inspect/clean

WARNING

 Wear goggles, dust-proof mask or other F0 2022-09-06 personal protective gears when handling compressed air, water or steam.

CAUTION

- When compressed air is used for cleaning. use the air at certain distance to avoid damaging the radiator fins.
- The fins shall be inspected on a daily basis despite of the service schedule when the machine is working on a dusty place.



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- 1. Open the engine hood (1).
- 2. Open the left access door of the machine.

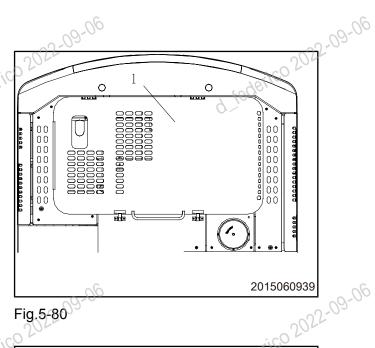


Fig.5-80

- 2022-09-06 3. Loosen the screws (3). Put up the screens (2).
- 4. Clean the screens.
- 5. Inspect the radiator (4), the intercooler fins (5), the air conditioner's condenser fins (6) and the hydraulic oil cooler fins (7). If mud, dust or leaves are found on these components, clean them with compressed air or water in the opposite direction of air flow.

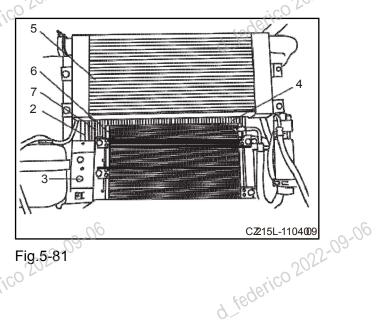
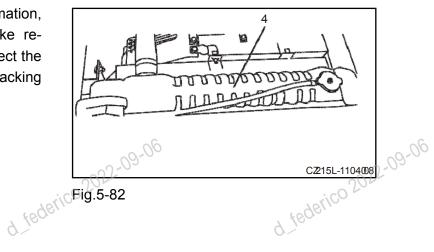


Fig.5-81

CAUTION

- Do not try to pick dirt out of the fins using hard tools. otherwise, the radiator fins may become damaged.
- 6. Check the radiator fins for deformation, holes or cracking after cleaning. Make repairs or replacement if necessary. Inspect the hoses. Replace the hoses in case of cracking or aging. Check for loose hose clamps.



- 7. Remove the bottom cover (8). Remove the dirt, debris and tree leaves that have been swept to the external edge.
 - 8. Restore screen (2) that has been cleaned and secure them with wing bolt (3).
 - 9. Install bottom cover (8) and lock the engine hood and the left access door.

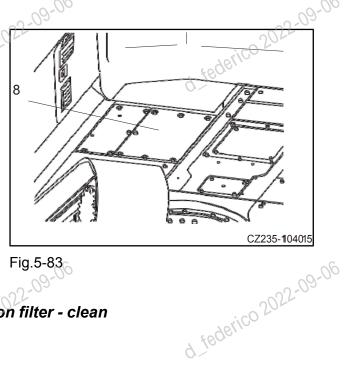


Fig.5-83

5.9.6.8 Air conditioner fresh air/recirculation filter - clean

▲ WARNING

 When using compressed air, blowing dust can lead to personal injury harm

Note:

The filter shall be cleaned every 500 hours, but operating your machine in a dusty place requires cleaning the filter more frequently.

A dust-clogged air filter reduces air flow and causes the A/C unit to produce noise.

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- 1. Remove the screw (1) from the access cover er in the rear of the cab, loosen the land to the land t
- 2. Use compressed air to clean the filter. If the filter bears oil or too much dirt, clean it with moderate detergent. After the filter has been flushed with water, it must be dried completely before reuse. This filter shall be replaced every year with a new one. If a plugged air filter cannot be cleaned with compressed air or d federic flushing water, replace it immediately.

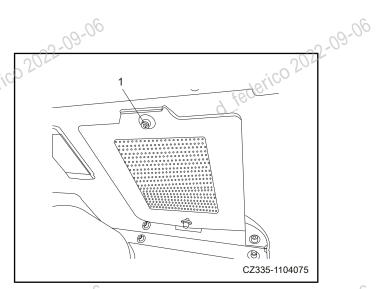
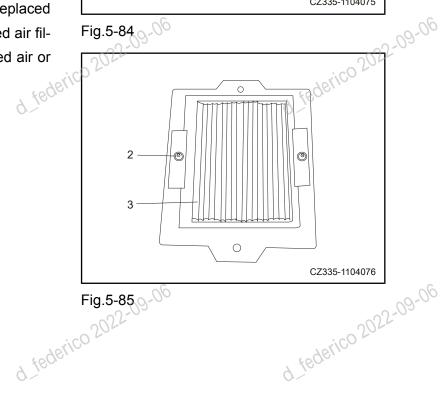


Fig.5-84



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Fresh air filter - clean

- 1. Unlock and open the cover (4) on the left side of the cab. Remove the locking nut (5) and take out the fresh air filter (6).
- 2. Use compressed air to clean the filter. If the filter bears oil or too much dirt, clean it with moderate detergent. After the filter has been flushed with water, it must be dried completely before reuse. This filter shall be replaced every year with a new one. If a plugged air filter cannot be cleaned with compressed air or flushing water, replace it immediately.
 - 3. After cleaning, restore the filter (6), tighten the nut (5) and lock the cover.

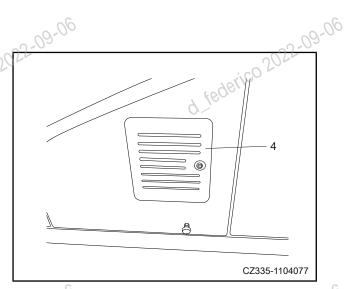


Fig.5-86

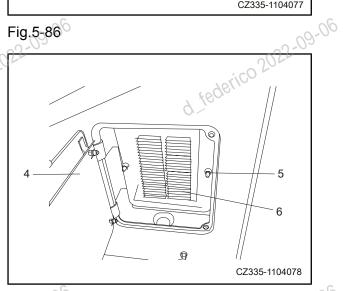
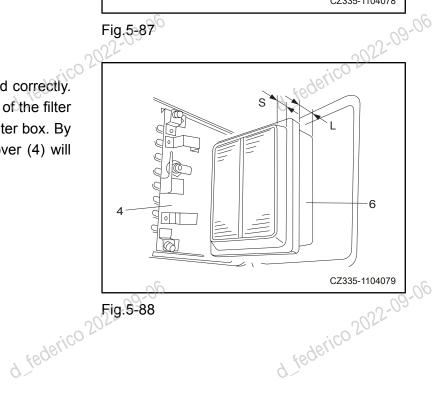


Fig.5-87



NOTE 2022-09-06 The fresh air filter must be installed correctly. To install the filter, the long end (L) of the filter (6) must be inserted first into the filter box. By inserting the short end (S), the cover (4) will not be closed.



federico 2022-09-06 5.9.6.9 Swing drive oil level - check/fill

WARNING

- When the engine has just been stopped. the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.
- 1. Remove the dipstick (G) and wipe off the oil on it.
- d federico 2022-09 2. Insert the dipstick (G) back into the tube.

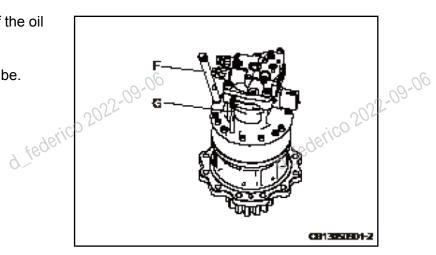


Fig.5-89

- 3. Take out the dipstick (G) and check whether the oil level is between the H and L marks.
- 4. If the oil level is lower than the L mark on the dipstick (G), remove the filler cap (F) and add oil...o
- 5. If the oil level goes beyond the H mark on the dipstick (G), loosen the drain valve (P) and to drain the excessive oil.
- If the oil level is too high, consult Sany dealer for inspection.
- Place a container under the drain valve before draining engine oil.

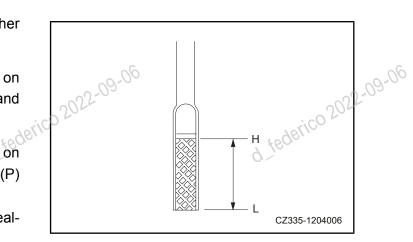


Fig.5-90

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6. After checking the oil level or refilling the oil, insert the dipstick (G) into the tube and restore the filler cap (F).

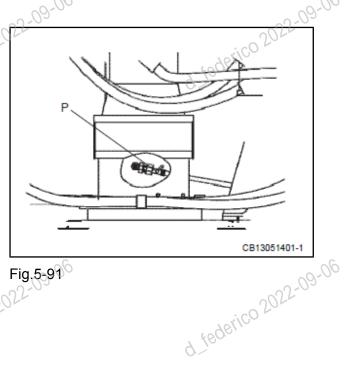


Fig.5-91

5.9.7 Every 1000 service hours

5.9.7.1 Introduction

The 100-, 250- and 500-hour services shall be carried out in the meantime.

5.9.7.2 Hydraulic oil return filter element - replace

WARNING

When the engine has just b een stopped, the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.

Note:

For machines equipped with a hydraulic breaker, the hydraulic oil deteriorates faster than that of machines operating with a bucket.

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1. Park your machine on a hard and level ground. Adjust the work equipment to an attitude ready for service. Lower the work equipment to ground and stop the engine.

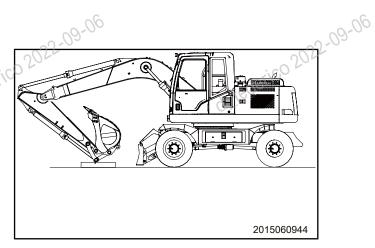


Fig.5-92

2. Remove the butterfly nut (1) of the breather valve on top of the hydraulic tank. Press the vent valve to release internal pressure.

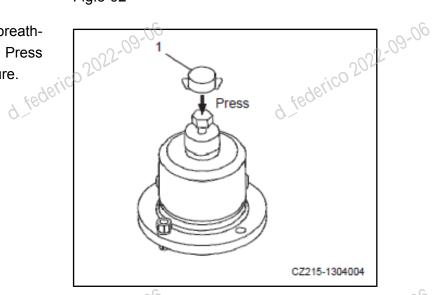


Fig.5-93

- 3. Loosen the four bolts and remove the cap (2). When the cap is being removed, it may eject due to the action of the spring (3). In this case, hold down the cap when removing the bolts.
- 4. Remove the spring (3), valve (4) and strainer (5) before disassembling the filter element (6).
- · Check the bottom of the filter box and remove the dirt if any. Keep the hydraulic oil free from any dirt.
- d federico 20 5. Clean the disassembled parts with cleaning oil. Jerici
- 6. Install a new filter element.

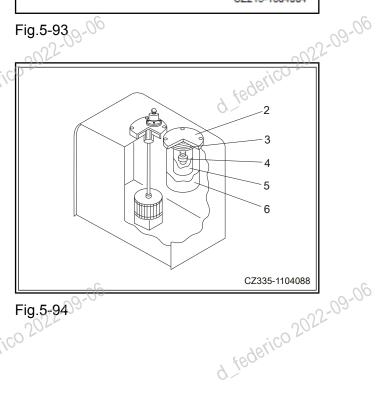


Fig.5-94

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- 7. Restore the valve (4), strainer (5) and spring (3).

 8. Install the cap (2) to its position 1. spring (3).
 - the cap and tighten the bolts.
 - 9. In order to bleed internal air, start and run the engine at low idle for 10 minutes.
 - 10.Stop the engine.

5.9.7.3 Swing drive oil - change

WARNING

- When the engine has just b een stopped, the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.
- Swing drive casing capacity: 3.0 L (0.79 US gal)
- Place a container under the drain valve (P) to collect the gear oil drained.
- Loosen the drain valve (P) to drain the gear oil. Tighten the drain valve upon completion of the draining.

NOTE

- If the gear oil flows out in a thin thread pattern, stop draining.
- When ambient temperature is low, you can swing the work equipment to slightly increase the oil temperature before draining the oil. However, the work equipment shall not be swung during draining, which may otherwise damage the swing unit.

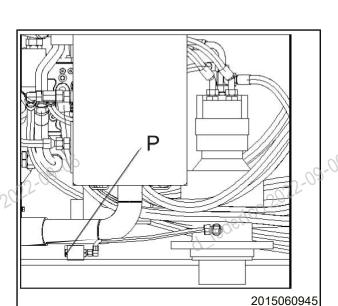


Fig.5-95

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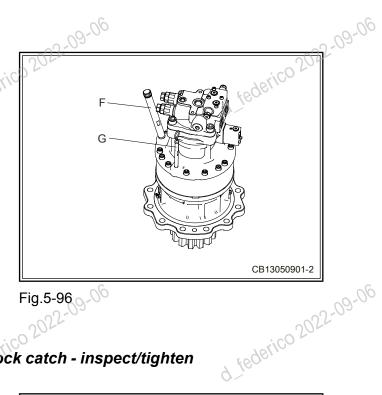


- 1. Remove the filler cap (F) and add oil as required through the filler opening.
- 2. Check the oil level. Thedetailscanb e s e e n "swing motor oil level-check/fill" on page 5-56.
- 3. Apply sealant onto the thread of the filler opening and tighten the filler cap.

Tightening torque: 2.7N·m

NOTE:

Improper tightening of the filler cap may cause the gear oil in the swing drive to leak.



5.9.7.4 Cab door lock and front window lock catch - inspect/tighten

1. Check the cab door lock.

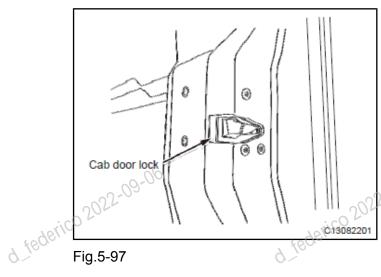


Fig.5-97

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2. Check the lock catch.

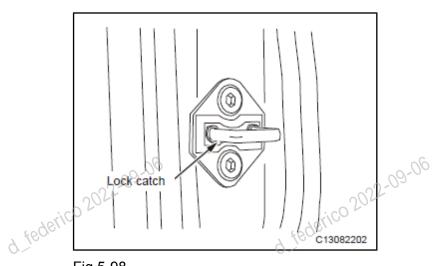
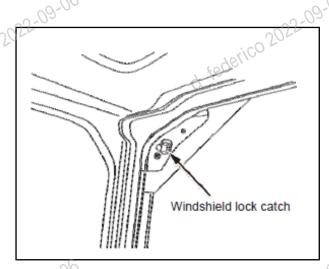


Fig.5-98



cab. (One at each side) 3. Check the windshield lock catch inside the cab. (One at each side)

When the items listed above are found loose, tighten them immediately so that the cab door and windows can be opened and shut properly.



2022-09-06

of the cab door hinge till grease is seen spilling out.

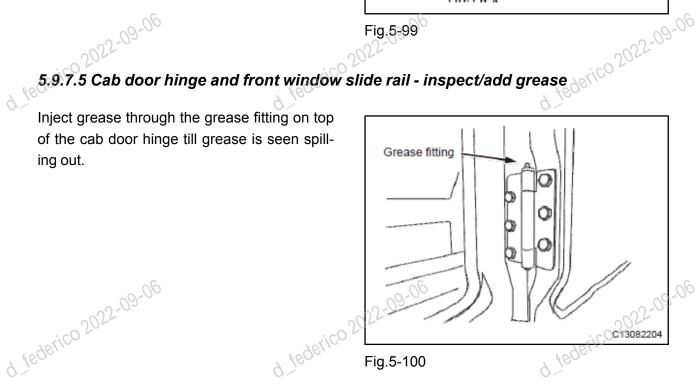
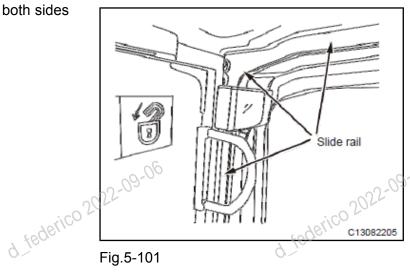


Fig.5-100

d_federico 2022-09-06 Apply grease onto the slide rails at both sides of the cab door ceiling.



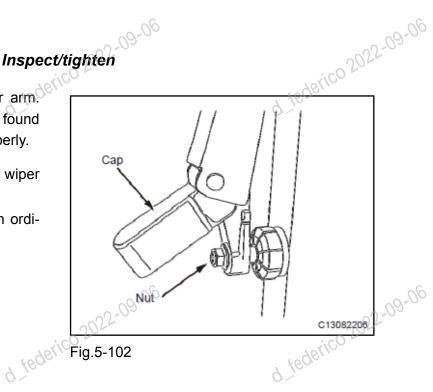


5.9.7.6 Windshield wiper arm nut - Inspect/tighten

Check the nut of the windshield wiper arm. Tighten the nut immediately when it is found loose so that the wiper can function properly.

- Raise the nut cap at the end of the wiper arm and check if the nut comes loose.
- Tighten it with a torque wrench or an ordinary wrench if the nut is loose.

Tightening torque: 35~45N·m d federico 2022-09-06



5.9.7.7 Engine exhaust pipe clamps - check

Consult Sany dealer to check the fastening conditions of the air cleaner - turbocharger post cooler - engine clamps.

5.9.7.8 Fan belt tension - check/replace

Check the tension of fan belt. Replace the fan belt in case of cracks or damage. Contact Sany dealer if you have any troubles.

3rico 2022-09-06 5.9.7.9 Nitrogen pressure in accumulator (breaker) - check

(If equipped)

Special tools will be used in order to check the accumulator and inject nitrogen.

Please consult Sany dealer, if possible, to con- duct related inspection and inflating operation. d federico 2022-09-06





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5.9.7.10 Breather valve - service

WARNING

- When the engine has just b een stopped, the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.
- Clean the top of the hydraulic tank and remove the contaminants around the breather valve. Disassemble the valve in a place that is free from fire sources and dust.

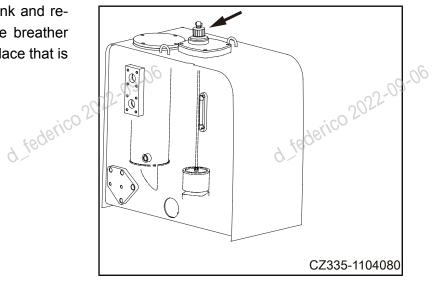


Fig.5-103

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- 2. Remove the butterfly nut (1) on the breather valve and press the vent valve to re- lease internal pressure.
- 3. Remove lock nut (2), cover (3) and take off the filter element (4).
 - 4. Clean the filter element with a brush if excessive dirt is found around the filter element. Then flush the element using Tonson detergent.
 - 5. Dry the filter element after it is cleaned, Install the filter element.

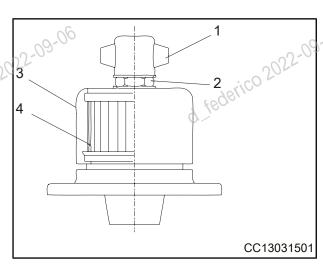


Fig.5-104

NOTE:

- When assembling the hexagonal nut (2), tighten it to the specific torque (10-14 N·m).
- Replace the breather valve when the filter element is worn out.



5.9.8 Every 2000 service hours

5.9.8.1 Introduction

d federico 2022-09-06

d_federico 2022-09-06 The 100-, 250-, 500- and 1000-hour services will be carried out simultaneously.

5.9.8.2 Hydraulic oil suction filter element clean/replace

CAUTION

- After the engine shuts down, the parts and oil are still at high temperature and that can cause serious burns. Wait for them to cool down before you proceed.
- 1. Remove the butterfly nut (1) of the breather valve on the hydraulic tank and press the vent valve to relieve internal pressure.

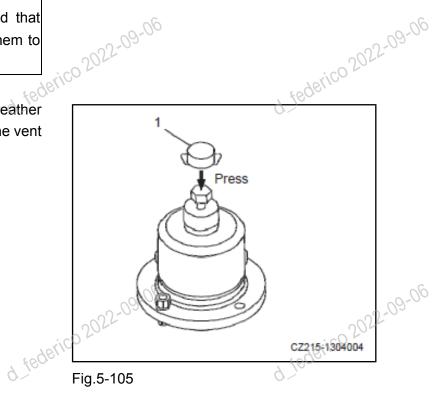


Fig.5-105

- 2. Loosen the four bolts and remove the cap (2). When the cap is being removed, it may fly out due to the action of the spring (3). In this case, hold down the cap when removing the bolts.
- 3. Hold the top end of the rod (4) and pull it upward to remove the spring (3) and the suction filter element (5).
- 4. Clean the suction filter element (5). Flush it with cleaning oil. Replace the suction filter element if it is damaged.

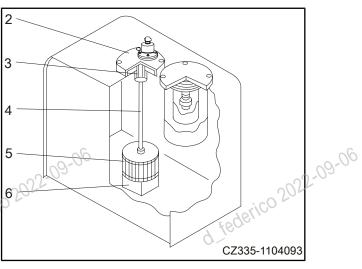


Fig.5-106

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- 5. During installation, fix the suction filter element (5) to the projected part (6) of the oil tank before assembling. before assembling.
 - 6. When assembling, use the bulged part of the cap (2) to hold the spring (3) before tightening the bolts.

5.9.8.3 Check the nitrogen pressure in the accumulator

WARNING

- The accumulator contains high pressure proper operation and result in machine damage and personal injury.

 Be away for damage and personal injury.
- Be away from fire sources.
- Do not bump or roll the accumulator. Keep it free from any impacts.
- Vent the air completely when handling the accumulator. Consult Sany's authorized dealer to do this job.

NOTE:

pressure in hydraulic circuit will not be released once failure occurs to your machine

Functions of the accumulator

The accumulator stores the pressure of the control circuit. Even if the engine is turned off, the control oil circuit allows you to achieve the following operations:

- Operate the control lever to lower the work equipment. The work equipment will fall due to gravity.
- The pressure in hydraulic circuit can be released. The installation location of the accumulator is shown in the right illustration

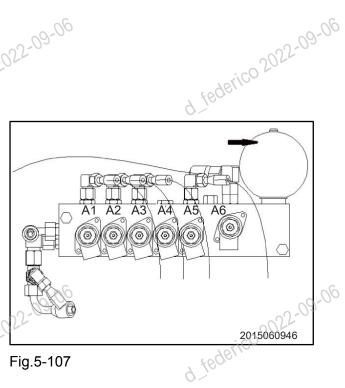


Fig.5-107

Check the functions of accumulator





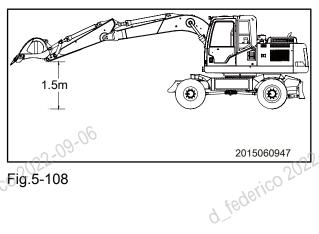
• During inspection, make sure the surrounding area is clear of personnel barriers.

Check nitrogen pressure in the accumulator through the following steps:

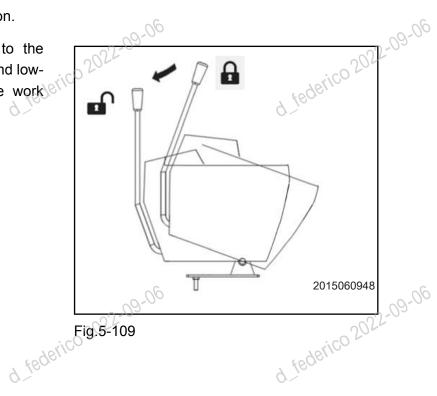
- 1. Park the machine on a hard and flat ground.
- 2. Keep the work equipment 1.5m (4'11") above the ground at maximum reach (with the arm cylinder and the bucket cylinder fully retracted). The step 3 through step 5 shall be con-ducted within 15 seconds.

The accumulator's pressure drops gradually after engine shutdown. Check the accumulator immediately after the engine is shut down.

- 3. Keep the work equipment at its maximum operating radius, turn the start switch to the OFF position and stop the engine.
- 4. Turn the start switch to the ON position.
- 5. Place the hydraulic lockout lever to the FREE position. Operate the joysticks and lower the work equipment. Check if the work equipment touches the ground.



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6. If the work equipment fall under its own weight to the ground, this shows the accumulator functions normally.

If the work equipment fails to fall to the ground, this shows pressure in the accumulator has dropped. Consult Sany dealer for such inspection.

7. Place the hydraulic lockout lever to the LOCKED position and turn the start switch to the OFF position. 0 2022-09-06

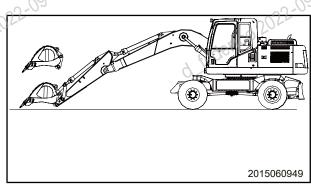


Fig.5-110

5.9.8.4 Cooling system interior - clean

WARNING

- Coolant in the radiator is still hot and under high pressure when the engine is shutting down. Removing the radiator cap at this time may cause severs bur-ns.
- Loosen the cover slowly when the coolant has cooled down to relieve internal pressure before removing it.
- When the engine is started for cleaning 02022-09-06 purpose, place the hydraulic lockout control in the LOCKED position to pre- vent unexpected machine movement.
- Antifreeze is flammable. Keep it far away from fire.
- Antifreeze is toxic. Never allow it to contact your eyes and/or your skin. Wash with plenty of water and seek medical treatment immediately if antifreeze contacts your eyes or skin.
- Never drain antifreeze directly into the sewer or onto the ground. Please contact

Clean the inside of radiator fins and re- place coolant coolant





- 1. Park your machine on a level ground and then shut off the engine.
- 2. Remove slowly the radiator cap (1) to relieve pressure only when the coolant is cool enough for you to touch the radiator cap with your bare hand.

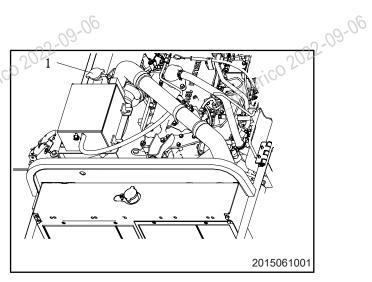


Fig.5-111 6

- 3. Remove the bottom cover under the radiator and place a container to collect the coolant under the drain valve (2). Open the drain valve (2) to drain the coolant.
- 4. Close the drain valve (2) after draining the coolant. Add tap water and cleaning agent into the radiator. When the radiator is full, start the engine at a low speed in order to heat up to 90°C (194°F) at minimum. Con-tinue to run the engine for about 10 min- utes.
- 5. Stop the engine and open the drain valve (2) to discharge water. Flush the cooling system with clean water till discharged water is clear so as to remove the rust and sediment inside the radiator.
- 6. Close the drain valve (2). Add coolant to the radiator till it overflows from the filler opening.

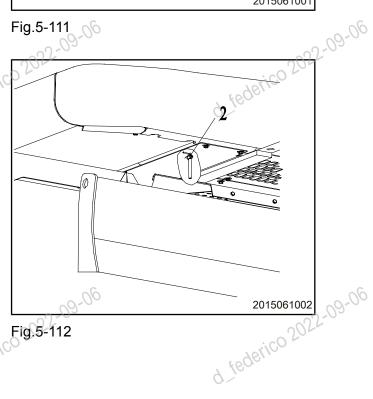
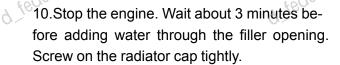


Fig.5-112





- 2-09-06 7. Run the engine at low speed for about 5 minutes and then at high speed for another 3 mi nutes to bleed the air from the coolant. (The radiator cap (1) shall be left open at the moment.)
 - 8. Check coolant level once again. Add more if necessary.
 - 9. Clean the reserve tank (3) after completely draining the coolant inside. Add water till the coolant level reaches a level between the high and the low marks. Replace the reserve tank with a new one if the old one is hardly cleaned.



11.Install the bottom cover.

Clean the inside of hydraulic oil cooler

- 1. Remove the hydraulic oil cooler before cleaning. Cleaning shall be performed on a clean washing table.
- same grade, plane kerosene, petrol or diesel fuel. Blow the inside of " an air pump.

NOTE:

- Keep the inside of the hydraulic oil cooler clean during the cleaning process. Do not wipe the cooler with cotton, linen or synthetic fibers.
- Recommended cleaning agent: Hydraulic oil federico 2022-09-06 of the same grade, plane kerosene, petrol, diesel fuel.

5.9.8.5 Alternator - inspect

Contact Sany dealer to inspect the alternator.

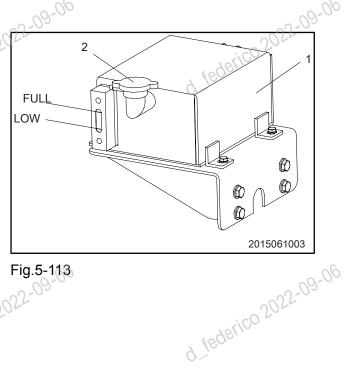


Fig.5-113



d_federico 2022-09-06

federico 2022-09-06 Check the engine every 1000 service hours if the engine is started frequently.

5.9.8.6 Engine valve clearance - check/adjust

Special tools are necessary for inspection and maintenance. Consult Sany dealer to do this job.

5.9.9 Every 4000 service hours

5.9.9.1 Introduction

d_federico 2022-09-06 The 100-, 250-, 500-, 1000- and 2000-hour services shall be carried out in the meantime.

5.9.9.2 Water pump - inspect

Check the water pump for water leakage or oil leakage. In case of any problem, contact Sany dealer for disassembly, repair or replacement.

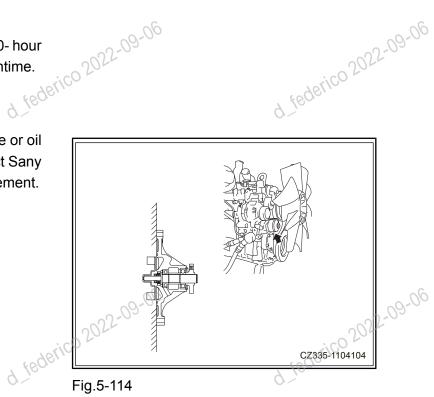


Fig.5-114

5.9.9.3 Start motor - check

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Consult Sany dealer to check the start motor. Check it every 1000 service hours if the engine is started frequently.



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5.9.9.4 Hydraulic tank oil - change

WARNING

- When the engine has just been stopped, the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.
- Press the breather valve venting button to release the internal pressure before removing the oil filler cap.

than that of machines operating with a bucket.

Refill oil: See "Capacity Total"

Refill oil: See "Capacity Table" on page 5-11

Prepare a lever (used for 36 mm socket wrenches)

- 1. Unscrew the bolts of the bottom cover plate and remove the cover plate.
- 2. Swing the upper structure in order to position the drain plug beneath the hydraulic tank between the tracks.
- 3. Retract the arm and bucket cylinders and lower the boom in order to enable the bucket tips to touch the ground.
 - 4. Place the lockout lever to the LOCKED position and turn off the engine.

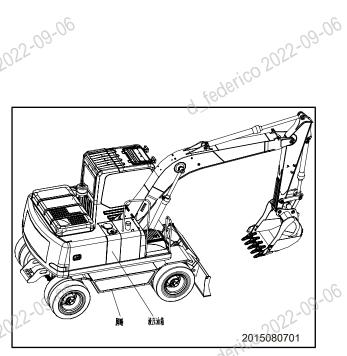


Fig.5-115

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- 5. Remove the cap of the oil filler (F).
- 6. Place a container under the drain plug. Remove the drain plug (P) with the lever to drain the oil. Check the O-ring on the drain plug (P) and replace it timely if broken. Tighten the plug (P) after draining.

NOTE:

Do not get oil on your body when removing the drain plug (P).

- 7. Add hydraulic oil as required through the filler (F). Check the oil level, which shall be be-
- For more information on applicable hydraulic oil, see "Recommended 5 ic oil, see "Recommended Fuel, Coolant and Lubricant" on page 5-11.
- For more information on oil level inspection, see "Hydraulic oil level - check/refill" on page 4-9.

5.9.9.5 Accumulator - replace

Replace the accumulator every two years or Jerico 2022-09-06 4000 service hours, whichever occurs first.

WARNING

- The accumulator contains pressurized nitrogen, which may explode due to improper operation and result in machine damage and personal injury.
- Be away from fire sources. Do not bump or roll the accumulator. Keep it free from any impacts.
- Vent the air completely when handling the d. federico 2022-09-06 accumulator. Consult Sany authorized dealer to do this job. d federico 2022

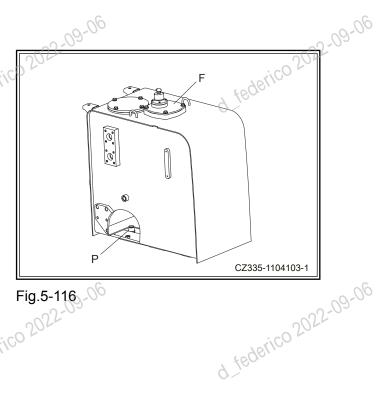


Fig.5-116



If your machine is kept operating when the performance of accumulator decreases, the pressure in the hydraulic system will not be released. Consult Sany dealer to replace the accumulator.

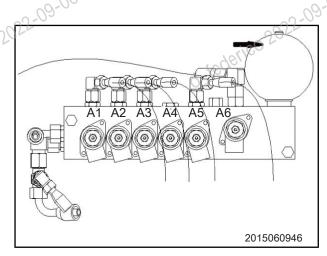


Fig.5-117

5.9.9.6 High-pressure tube clamps and rubber - check Fig. 5-

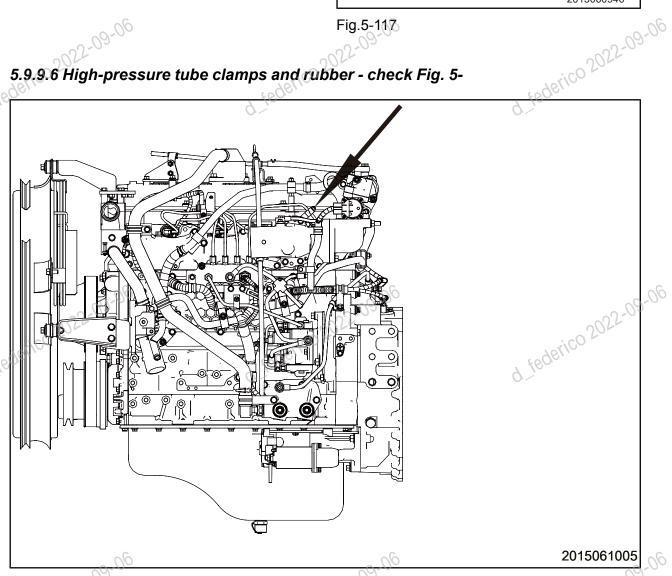


Fig.5-118

Through observation and touch, check the five mounting clamps of high pressure pipe between the supply pump and the spray nozzle whether there are loose bolts. Contact Sany authorized dealer to replace the parts in trouble.

5.9.9.7 Compressor working condition - inspect The following to the second sec

The following two items are to be inspected:

- 1. Whether the compressor and the magnetic clutch are switched on or off when switching on or off the air conditioner.
- 1. Whether the clutch or compressor produces abnormal noise.

d_federico 2022-09-06 If problems are found contact Sany a uth or ized dealertorepairorrep-lacethe components.

5.9.10 Every 8000 service hours

5.9.10.1 Introduction

The 100-, 250-, 500-, 1000-, 2000- and 4000services shall be carried hour out simultaneously.

5.9.10.2 High-pressure tube clamps - replace

federico 2022-09-06 Contact Sany dealer to replace the high-pressure tube clamps of the engine.

5.9.11 Every 10000 service hours

Contact Sany authorized dealer t o d o t h e m aintenanceforthewholema-chi n e if the working time reaches 10000 hours.

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Troubleshooting

| 00-0 | 0-0 | 00-0 |
|---|--------------------|------|
| 6 Troubleshooting 6.1 Special introduction | | 6-1 |
| 6.1 Special introduction | 18/100 0 | 6-3 |
| 6.1.1 Special introduction | 160° | 6-3 |
| 6.2 Troubleshooting Preparation | | 6-4 |
| 6.2.1 Checks before troubleshoo | oting | 6-4 |
| 6.2.2 Troubleshooting precaution | าร | 6-5 |
| 6.2.3 Electrical circuits troublesh | ooting precautions | 6-6 |
| 6.2.4 Hydraulic components han | dling precautions | 6-7 |
| 6.3 Engine Failures | | 6-8 |
| 6.3.1 Engine troubleshooting tab | le | 6-8 |
| 6.3.2 Coolant temperature high | -6 | 6-12 |
| 6.3.3 Engine oil pressure low | ~ 68°00 | 6-13 |
| 6.3.2 Coolant temperature high 6.3.3 Engine oil pressure low 6.3.4 When fuel runs out | 2027 | 6-14 |
| 6.3.5 When engine rotates revers | sely | 6-15 |
| 6.4 Failures of the Electrical System. | 160. | 6-15 |
| 6.4.1 Electrical system troublesh | ooting table | 6-15 |
| 6.4.2 Failure codes | | 6-18 |
| 6.4.3 Battery | | 6-20 |
| 6.4.3.1 Introduction | | 6-20 |
| 6.4.3.2 Battery removal and in | stallation | 6-21 |
| 6.4.3.3 Battery charging | | 6-21 |
| 6.4.3.4 Starting engine with jur | mper cable | 6-22 |
| 6.5 Failures of the Hydraulic System | | 6-24 |
| 6.5.1 Failures of the Hydraulic Sy | ystem | 6-24 |
| 6.6 Other Common Failures | 100000 | 6-29 |
| 6.5 Failures of the Hydraulic System 6.5.1 Failures of the Hydraulic Sy 6.6 Other Common Failures 6.6.1 Other Common Failures | is general | 6-29 |
| | | V- |

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d_federico 2022-09-06

d federico 2022-09-06

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WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operation or maintaining it. Failure to do d federico 2022-09 this could result in death or serious injury. d federico 202

d_federico 2022-09-06

6.Troubleshooting

6.1 Special introduction

6.1.1 Special introduction

Your equipment in the use of the process of the following similar circumstances, These is a normal situation and in line with industry standards, please feel free to use.

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- 1. The product design, without the function, but because you do not understand the product function, mistaken as a fault, (such as can not adapt to high altitude above 4km regional conditions).
- 2. The engine instantly fell slight fault of black smoke have speed or work in the normal range, but the scene detection belongs to engine operation, the ambient temperature is lower than 30 °C, with instant smoke value not greater than 4.5RP, load smoke is not greater than 1.5RP.
- 3. Engine oil, excessive fuel consumption failure, on-site inspection is within the normal consumption range of manufacturers.
- 4. Because you are unskilled operation, fuel consumption too many failures caused by poor equipment operation stability, poor climbing ability, slow walking deviation and equipment service personnel at the scene detection parameters in the production of the factory standard range (such as weight, diffuser climb a slope greater than 35°).
- 5. Hydraulic oil return system (such as slight noise, noise, oil return pipeline noise etc.) check the hydraulic system and normal hydraulic oil return filter without iron, copper and aluminum scraps and other impurities, and does not affect the normal operation of the equipment.
- 6. The industry is widespread phenomenon, such as piston rod discoloration and black; oil cylinder reverse arm or automatic settlement in the scope of permission, engine winter low temperature start difficult.





| | ubleshooting Preparation ecks before troubleshooting | 3-06 | d federico 2022-09-9 |
|--|---|--|---|
| 5.2.1 Che | ecks before troubleshooting | | d tederio |
| | Item | Judgement value | Remedy |
| Lubrica ting,oil, coolant | Check fuel level and type of fuel Check for impurities in fuel Check hydraulic oil level Check hydraulic oil strainer Check swing drive oil level Check engine oil level (in oil pan) Check coolant level Check dust indicator for clogging Check hydraulic filter Check final drive oil level | - - - - - - - - - - - - - - | Add fuel Clean, drain Add oil Clean, drain Add oil Add oil Add water Clean or replace Replace Add oil |
| Electri cal equip ment | 1. Check for looseness and corrosion of battery terminal and wiring 2. Check for looseness and corrosion of alternator terminal and wiring 3. Check for looseness and corrosion of start motor terminal and wiring | _ _ _ _ | Tighten or replace Tighten or replace Tighten or replace Tighten or replace |
| Hydraul ic ,me chanica I,equip ment | Check for abnormal noise and smell Check for oil leakage Carry out air bleeding | 3-06 <u> </u> | Repair Repair Bleed air |
| Elec trics, electri cal equip ment | Check battery voltage (engine stopped) Check battery electrolyte level Check for discolored, burnt, exposed wiring Check for missing wiring clamps and hanging wiring Check for water leaking on wiring (be particularly careful attention to water leaking on connectors or terminals) Check for blown or corroded fuses Check alternator voltage (engine running at 1/2 throttle or above) Check operating sound of battery relay (when switch is turned ON/OFF) | 20-30V — — — — — After running for several minutes: | Replace Add or replace Replace Repair Disconnect con nector and dry Replace Replace |
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ico 2022-09-06

6.2.2 Troubleshooting precautions

CAUTION

- Park the machine on a hard, level ground. Make sure safety pins, blocks and machine brake are functional.
- Workers in the same team must use the same signal system. Keep other personnel a safe distance away from the machine.
- If the radiator cap is removed when the engine is hot. Hot coolant may squirt out and cause burns, wait for the engine to cool down before troubleshooting.
- Take care not to touch any hot parts or be caught by any rotating parts.
- Before disconnecting any electrical wiring, always disconnect the negative (–) post of battery.
- Before removing the plug or cap from any vessel that contains pressurized oil, water or air, release the internal pressure.
- When installing a measuring equipment, be sure to connect it properly.
- The aim of troubleshooting is to pinpoint the basic cause of the failure, to carry out repairs swiftly, and to prevent reoccurrence of the failure.
- When carrying out troubleshooting, it is important to understand the structure and function.
- However, a short cut to effective troubleshooting is to ask the operator various questions to form some idea of possible causes of the failure that would produce the reported symptoms.
- 1. When carrying out troubleshooting, do not hurry to disassemble the components.

If components are disassembled immediately any failure occurs:

- Parts that have no connection with the failure or other unnecessary parts will be disassembled.
- It will become impossible to find the cause of the failure.

It will also cause a waste of man-hours, parts, or oil or grease, and at the same time, will also lose the confidence of the user or operator.

For this reason, when carrying out troubleshooting, it is necessary to carry out thorough prior investigation and to carry out troubleshooting in accordance with the fixed procedure.

- 2. Points to ask user or operator:
- Have any other problems occurred apart from the problem that has been reported?
- Was there anything strange about the machine before the failure occurred?
- Did the failure occur suddenly, or were there problems with the machine condition before this?
- Under what conditions did the failure occur?
- Has the same kind of failure occurred before?

 Check before ** Had any repairs been carried out before the failure?
- d federic
- 3. Check before troubleshooting
 - Check the oil level.
 - Check for any external leakage of oil from the piping or hydraulic equipment.



- Check the travel of the control levers.
- Check the stroke of the control valve spool.
- ico 2022-09-06 iico 2022-09-06 Other maintenance items can be checked externally, so check any item that is considered to be necessary.
- 4. Confirming failure
- Confirm the extent of the failure yourself, and judge whether to handle it as a real failure or as a problem with the method of operation, etc.
- When operating the machine to reenact the troubleshooting symptoms, do not carry out any investigation or measurement that may make the problem worse.
- 5. Troubleshooting
- Use the results of the investigation and inspection in Items 2 4 to narrow down the causes of failure, then use the troubleshooting flowchart to locate the position of the failure exactly.
 The basic procedure for troubleshooting is as follows.
 1) Start from the simple points.
- - 2) Start from the most likely points.
 - 3) Investigate other related parts or information.
- 6. Measures to remove root cause of failure
- Even if the failure is repaired, if the root cause of the failure is not repaired, the same fail- ure will occur again.

d_federico 2022-09-06 To prevent this, always investigate why the problem occurred. Then, remove the root cause.

6.2.3 Electrical circuits troubleshooting precautions

- 1. Always turn the power off before disconnecting or connect connectors.
- 2. Before carrying out troubleshooting, check that all the related connectors are properly inserted...
- Disconnect and connect the related connectors several times to check.
- 3. Always connect any disconnected connectors before going on to the next step.
- If the power is turned ON with the connectors still disconnected, unnecessary abnormality displays will be generated.
- 4. When carrying out troubleshooting of circuits (measuring the voltage, resistance, continuity, or current), move the related wiring and connectors several times and check that there is no change in the reading of the tester.
- If there is any change, there is probably defective contact in that circuit.



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6.2.4 Hydraulic components handling precautions

With the increase in pressure and precision of hydraulic equipment, the most common cause of failure is dirt (foreign material) in the hydraulic circuit. When adding hydraulic oil, or when disassembling or assembling hydraulic equipment, it is necessary to be particularly careful.

1. Be careful of the operating environment

Avoid adding hydraulic oil, replacing filters, or repairing the machine in rain or high winds, or places where there is a lot of dust.

2. Disassembly and maintenance work in the field

If disassembly or maintenance work is carried out on hydraulic equipment in the field, there is danger of dust entering the equipment. It is also difficult to confirm the performance after repairs, so it is desirable to use unit exchange. Disassembly and maintenance of hydraulic Jederico 2022-09-06 equipment should be carried out in a specially prepared dust-proof workshop, and the performance should be confirmed with special test equipment.

3. Do not let any dirt or dust get in during refilling operations.

Be careful not to let any dirt or dust get in when refilling with hydraulic oil. Always keep the oil filler and the area around it clean, and also use clean pumps and oil containers. If an oil cleaning device is used, it is possible to filter out the dirt that has collected during storage, so this is an even more effective method.

4. Change hydraulic oil when the temperature is high.

When hydraulic oil or other oil is warm, it flows easily. In addition, the sludge can also be drained out easily from the circuit together

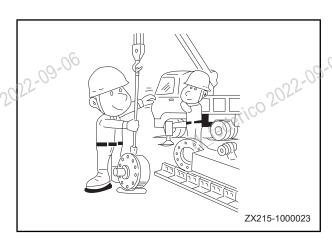


Fig.6-1

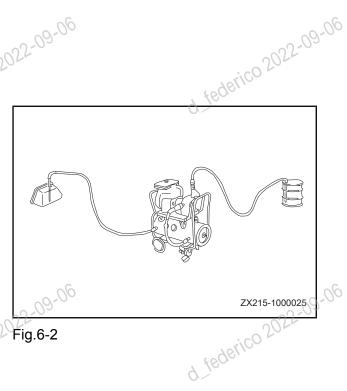


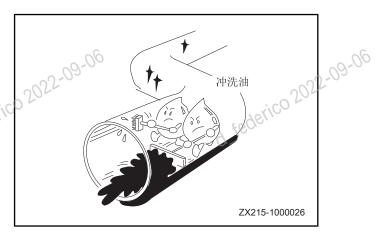
Fig.6-2



conange the oil when still warm. When changing the oil, as much as possible of the old hydraulic oil must be drained out. (Drain the oil from the hudic tank; also drain the from the drain plug in the circuit.) If any old oil is left, the contaminants and sludge in it will mix with the new oil and will shorten the life of the hydraulic oil.

5. Flushing operations

After disassembling and assembling the equipment, or changing the oil, use flushing oil to remove the contaminants, sludge, and old oil from the hydraulic circuit. Normally, flushing is carried out twice: primary flushing is carried out with flushing oil, and secondary flushing is carried out with the specified hydraulic oil.



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Fig.6-3

6. Cleaning operations

After repairing the hydraulic equipment (pump, control valve, etc.) or when running the machine, carry out oil cleaning to remove the sludge or contaminants in the hydraulic oil circuit. The oil cleaning equipment is used to remove the ultra fine (about 3µ) particles that the filter built into the hydraulic equipment cannot remove, so it is an extremely effective device.

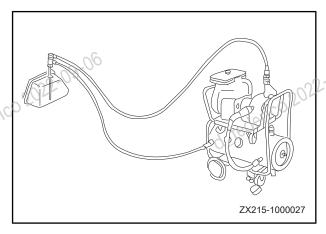


Fig.6-4

6.3 Engine Failures

6.3.1 Engine troubleshooting table

2022-09-06 Check the engine according to the following table if any failure occurs to it. Contact your Sany distributor to repair the engine.

| 20.00 | | 00-00 | 20-00 | | |
|---------|---|--|---|--|--|
| Failure | | ailure | Causes | Remedy | |
| d fed | Jerico 2 | Starter fail- ure or reluc- tant rotation. | Battery dead Battery that has disconnected or loose cable, or is corroded. Fuse breaks. Failure of start switch or start relay. Failure of start motor. Engine oil viscosity high. | Recharge/replace the battery. Remove the corroded part. Replace the fuse. Replace the start switch or relay. Repair/replace the start motor. Use engine oil with suitable viscosity. | |
| | When the en- gine fails to start | Starter is OK. | Fuel exhausted. Fuel injector opening pressure low. Failure of fuel delivery valve of injection pump Failure of control rack of injection pump Worn or stuck plunger of injection pump Improper starting operation Air trapped in the fuel system Fuel filter plugged Air cleaner plugged | Refill the fuel and purge the air. Adjust/replace the fuel injector. Replace the fuel delivery valve. Repair or replace the control rack. Replace the plunger assembly. Start the engine in regular steps. Purge air from the fuel system. Replace filter element or cartridge. Clean/replace air cleaner element. | |
| - | Engine sh immediate starting. | | Idle speed low.Fuel filter pluggedAir cleaner pluggedBattery dead | Replace fuel filter element or cartridge. Clean/replace air cleaner element. | |
| 0.7 | Jerico 202 Low idle s | peed instable | Failure of low idle controller Fuel system leaks or is blocked. Air trapped in the fuel system Fuel system contains water. Fuel filter element plugged Failure of injection pump Bad adjustment of air valve clearance Broken cylinder gasket, worn cylinder liner, stuck or ruptured piston ring, or defective contact between air valve and its seat | Repair/replace the low idle control system. Repair the fuel system. Pure the air from fuel system. Change the fuel. Replace fuel filter element or cartridge. Repair/replace related parts of fuel injection pump. Readjust air valve clearance. Replace relevant parts. | |
| d fed | Power ins | ufficient | Fuel filter plugged Fuel contaminated by water Air cleaner plugged Failure of fuel delivery pump | Replace fuel filter element or cartridge. Change the fuel. Clean/replace air cleaner element. | |

| 20-06 | 00 | ,_06 |
|-----------------------|---|--|
| d federico 2022-09-06 | Fuel injector activating pressure low; injection effect not good Failure of injection pump Exhaust gas leaks. Air leaks from intake. Turbocharger assembly damaged Exhaust valve blocked Bad adjustment of air valve clearance Soft or broken spring of air valve Broken cylinder gasket, worn cylinder liner, stuck or ruptured piston ring, or defective contact between air valve and its seat | Repair/replace fuel delivery pump Readjust/replace fuel injector. Repair/replace related parts of the fuel injection pump. Replace relevant parts. Replace turbocharge assembly. Clean the exhaust pipe. Adjust valve clearance. Replace gas spring. Replace relevant parts. |
| Engine overheated | Insufficiency of coolant Fan belt skids due to looseness or cracking. Radiator cap damaged or radiator core plugged Coolant pump damaged Coolant leaks due to broken cylinder head or cylinder block seal cap Thermostat damaged Cooling system blocked by foreign object Improper adjustment of fuel injection timing | Refill coolant. Replace fan belt. Replace radiator cap or clean radiator core. Repair/replace coolant pump. Replace seal cap. Replace thermostat. Remove foreign object from the cooling system. Readjust fuel injection timing. |
| White exhaust gas | Fuel contaminated by water Sluggish fuel injection timing Broken cylinder gasket, worn cylinder liner, stuck or ruptured piston ring, or defective contact between air valve and its seat Failure of turbocharger Defective valve oil seal or worn valve stem and valve guide tube Wear, rupture or incorrect setup of piston ring Scratch or wear of cylinder liner | Change the fuel. Readjust fuel injection timing. Replace relevant parts. Repair/replace. Replace valve oil seal, valve and valve guide tube. Replace the piston or reset it correctly. Replace cylinder liner. |

| 00.06 | 30.06 | 2.00 |
|--|---|--|
| Black exhaust gas | Air cleaner plugged Fuel injector activating pressure low or bad injection effect Improper adjustment of fuel injection timing Fuel drips after injection due to damage of fuel injection pump delivery valve Excessive injection of the injection pump | Clean/replace air cleaner element. Readjust/replace fuel injector. Readjust fuel injection timing. Replace fuel delivery valve. Readjust fuel injection amount. |
| Excessive consumption of fuel | Fuel leaks. Air cleaner plugged Low idle improper Fuel injector activating pressure low, or bad injection effect Fuel injection timing incorrect Fuel drips after injection due to damage of fuel injection pump delivery valve. Air leaks from the intake side of turbocharger. Turbocharger assembly damaged Bad valve clearance Soft or broken valve spring Broken cylinder gasket, worn cylinder liner, stuck or ruptured piston ring, or defective | Repair/replace related parts of the fuel system. Clean/replace air cleaner element. Readjust low idle. Adjust/replace fuel injector. Readjust fuel injection timing. Replace fuel delivery valve. Repair the intake side of turbocharger. Replace turbocharger assembly. Readjust valve clearance. Replace valve spring. Replace relevant parts. |
| Excessive consumption of oil Oil pressure low | Bad oil Excessive oil Oil leaks through oil seal and/or gasket. No preheating operation Defective valve oil seal, or wear of valve stem and valve guide tube Wear, rupture or improper setup of piston ring Scratch or wear of cylinder liner Bad oil viscosity Oil leaks through oil seal and/or gasket. | Use suitable oil. Drain excessive oil. Replace oil seal and/or gasket. Follow the procedure specified Replace related parts. Replace piston ring or reset it properly. Use lubricant with proper viscosity. |
| | Oil filter element plugged | Replace oil seal and/or gasket. |

| | 00-00 | 00 | -00 |
|-------------------|---------------------|--|--|
| d federico | 2022-0 | Stuck safety valve and/or soft bypass valve spring Oil pump screen plugged Wear of oil pump related parts | Replace oil filter element or cartridge. Replace spring of safety valve and/ or bypass valve. Clean the screen of oil pump. Replace related parts of oil pump |
| Strange engine | Gas leaking noise | Exhaust pipe connector loose or exhaust pipe broken Fuel injector loose Exhaust manifold connector loose Cylinder gasket broken | Tighten exhaust pipe connector or replace exhaust pipe. Replace gasket and tighten fuel injector. Tighten the connector of exhaust manifold. Replace cylinder gasket. |
| noise | Continuous noise | Fan belt loose Cooling fan loose Worn or damaged coolant pump bearing Bad valve clearance | Readjust belt tension. Tighten the cooling fan. Replace coolant pump bearing. Readjust valve clearance. |

6.3.2 Coolant temperature high

WARNING

- · Never remove the radiator cap when the d tederico 2022-09-06 coolant is still hot. Hot water or steam may squirt and cause burns.
- · Wait the coolant to cool down before removing the radiator cap.

A CAUTION

- · Do not stop the engine immediately. Sudden rise of coolant temperature can cause engine parts to burn.
- · Refill the coolant slowly in several times. Quick filling of low-temperature coolant d federico 2022-09-06 can cause engine cracks.





When the coolant temperature gauge shows a temperature higher than 100°C, the coolant temperature alert indicator will be on. Stop operating your machine and keep engine running at a speed a little higher than idle in order to reduce temperature. When the pointer of cool- ant temperature gauge returns to the middle position, the alert indicator is off. Now, stop the engine and perform the following steps.

- 1. Check radiator hoses for coolant leak.
- 2. Check V- belt for rupture. Check the belt tension.
- 3. Check coolant level. Refill coolant if necessary.
- Opentheradiatorcap(2)from the reservoir (1) and refill coolant to the FULL mark. Tighten the cap properly.
- 4. Check the front of radiator for any contaminants.
- encounters higher coolant temperature, the cooling system has a problem cooling system has a problem.

6.3.3 Engine oil pressure low

When the engine is just started, the oil pressure gauge indicates high pressure before the engine is preheated. Check oil pressure after the engine is fully preheat- ed.

J. federico 2022-09-06 When engine oil pressure is abnormal, which is shown on the monitor, stop operating your machine, shut down the engine immediately, and proceed as the following.

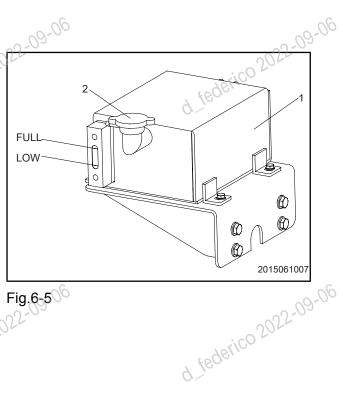


Fig.6-5







- Shut down the engine immediately. Keep running the engine can cause dame the engine.
- 1. Check for oil leak.
- 2. Check engine oil level. Refill necessary...
- Remove the dipstick [1]. Wipe off the oil on it with cloth.
- Fully insert the dipstick [1] into oil and then slowly pull it out.
- If oil level between the marks L and H, the amount of oil is good.
- If oil level is low, add oil immediately. If engine oil is contaminated, change the oil immediately.
- Replace the dipstick(1) after checking.
- 3. If engine oil level is normal but the oil pressure gauge reads wrong, the low oil pressure alert indicator and oil filter indicator will be on. Contact your Sany distributor to solve the d federico 2022-09

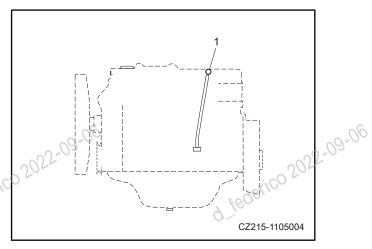
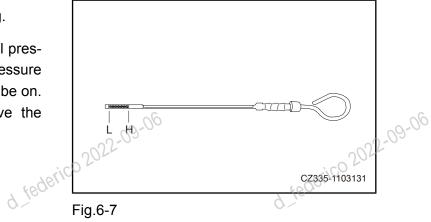


Fig.6-6



6.3.4 When fuel runs out

Engine shuts down when fuel exhausts or air enters the fuel system due to replacement of fuel filter. If you are unable to start the engine after refilling the fuel, purge the air through the following steps. d federico 2022-0





WARNING

- 02022-09-06 Never use a lighter, smoke, or use other fire sources when purging the air. A fire source can cause fire.
 - Completely remove engine oil or fuel splashed onto the exhaust pipe and other places. These oil and fuel can cause fire or slipping accident.
 - The space for air-purging operation is limited. Take care not to be cut by the edges. EO 2022-09-06

6.3.5 When engine rotates reversely

WARNING

 Reverse rotation of engine can burn the engine within several minutes or cause severe injury. Shut down the engine immediately once reverse rotation is found. The exhaust gas from air cleaner is possible to cause fire.

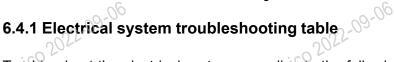
The following symptoms can be used to identify reverse rotation of engine.

- Heavy smoke coming out from air cleaner
 Tachometer and oil pressure dates Tachometer and oil pressure gauge giving no response
 - Low oil pressure alert indicator on Check and clean the air cleaner and intake hoses after shutting down the engine. Replace any defective air cleaner or hose immediately.

6.4 Failures of the Electrical System

Trouble-shoot the electrical system according to the following tables. Contact your Sany distributor solve the problem.





| | 9.00 | |
|---------------------------------|---|---|
| Failure | Causes | Remedy |
| Engine fails to start | Battery low Engine start switch internal failure Pilot switch failure Start motor failure Open circuit of wire harness Fuse failure (F1) Short circuit of wire (grounding failure) Alternator internal failure Start relay failure Brake failure | Recharge/replace the battery. Replace Repair/replace Repair/replace Check/repair Replace Check/repair Repair/replace Repair/replace Repair/replace Replace Replace Replace Replace |
| Rough engine speed | Open circuit of wire harness Sensor internal failure Short circuit of wire (grounding failure) Sensor internal failure | Check/repair Replace Check/repair Replace |
| Unable to power off the machine | Battery relay failure | Replace |
| Auto idle fails. | Boom-up signal failure Boom-down signal failure Arm-in signal failure Arm-out signal failure Bucket-dig signal failure Bucket-dump signal failure Swing signal failure Travel signal failure Attachment signal failure Controller failure | Check/repair Replace |
| Preheating function fails. | Preheat fuse failure Preheat relay failure Short circuit of wire (grounding failure) Preheat controller failure | ReplaceReplaceCheck/repairReplace |
| All devices fail. | Hydraulic lockout control failure Short circuit of wire (grounding failure) Failure of internal coil of pilot lockout valve | Repair/replace Check/repair Replace |
| Boom slow and weak | Sensor failure Short circuit of harness (grounding failure) Open circuit of harness Controller failure | Replace Replace Check/repair Replace |

| | Failure | Causes | Remedy |
|-------|--|--|---|
| d fe | Arm slow and weak | Sensor failure Short circuit of harness (grounding failure) Open circuit of harness Controller failure | ReplaceCheck/repairCheck/repairReplace |
| | Bucket slow and weak | Sensor failure Short circuit of harness (grounding failure) Open circuit of harness Bucket confluence solenoid valve failure Controller failure | Replace Check/repair Check/repair Replace Replace |
| 9 16 | Travel slow and weak | Sensor failure Short circuit of harness (grounding failure) Open circuit of harness Controller failure | Replace Check/repair Check/repair Replace |
| • | Monitor black-out | Fuse failure Open circuit of wire Short circuit of wire (grounding failure) Monitor failure | ReplaceCheck/repairCheck/repairReplace |
| | Monitor displays nothing. | Resistor failure Open circuit of wire Short circuit of wire (grounding failure) Monitor or controller failure | Replace Check/repair Check/repair Replace |
| d fer | Dual-travel speed failure | Dual travel speed solenoid valve failure Open circuit of wire Short circuit of wire (grounding failure) | ReplaceCheck/repairCheck/repair |
| | Engine coolant temperature reading incorrect | Coolant temperature sensor failure Open circuit of wire Short circuit of wire (grounding failure) Wire short-circuited with 24V | Replace Check/repair Check/repair Check/repair |
| d te | Fuel level reading incorrect | Fuel level sensor failure Open circuit of wire Short circuit of wire (grounding failure) Wire short-circuited with 24V | Replace Check/repair Check/repair Check/repair |

| 00.00 | 20-06 | | ~O. |
|--|--|--|-----|
| Failure | Causes | Remedy | .03 |
| Wiper failure | Wiper motor internal failure Open circuit of wire Short circuit of wire (grounding failure) | Repair/replace Check/repair Check/repair | |
| Arm-in pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replaceCheck/repairCheck/repairReplace | |
| Arm-out pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replace Check/repair Check/repair Replace | -09 |
| Boom-up pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replaceCheck/repairCheck/repairReplace | |
| Boom-down pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replaceCheck/repairCheck/repairReplace | |
| Bucket-dig pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replaceCheck/repairCheck/repairReplace | -0º |
| Bucket-dump pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Replace Repair/replace Check/repair Check/repair Replace | |
| Swing pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replaceCheck/repairCheck/repairReplace | |
| Travel pilot pressure reading incorrect | 5V power supply failure Open circuit of signal line Short circuit of signal line Sensor failure | Repair/replaceCheck/repairCheck/repairReplace | ~O. |
| 6.4.2 Failure codes | d federico 2022-09 | Check/repair Replace re analysis. | .00 |

6.4.2 Failure codes

| | | 00.00 | 20-06 |
|--------------------|---------|--|--|
| | Code | Symptom | Alarm Trigger Condition |
| tede | E201 | Power voltage | Electric generator collecting volt lower than 20V for 10s. |
| | E401 | CAN bus abnormal | CAN communication monitoring component overtime or reset characters changed for 3s |
| | E501 | Accelerator rotary knob abnormal | Accelerator rotary knob collecting volt lower than 0.25V or higher than 4.75V for 3s |
| | H101 | Front pump pressure sensor abnormal | Front pump pressure collecting volt lower than 0.25V or higher than 4.75V for 3s |
| | H102 | Rear pump pressure sensor abnormal | Rear pump pressure collecting volt lower than 0.25V or higher than 4.75V for 3s |
| | H201 | Bucket-dig pilot pressure sensor abnormal | Bucket-dig pilot pressure collecting volt lower than 0.25V or higher than 4.75V for 3s |
| tede | H202 | Bucket-dump pilot pressure sensor abnormal | Bucket-dig pilot pressure collecting volt lower than 0.25V or higher than 4.75V for 3s |
| | H203 | Arm-in pilot pressure sensor abnormal | Arm-in pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| | H204 | Arm-out pilot pressure sensor abnormal | Arm-out pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| | H205 | Boom-up pilot pressure sensor abnormal | Boom-up pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| | H206 | Boom-down pilot pressure sensor abnormal | Boom-down pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| 10 | H207 | Travel pilot pressure sensor abnormal | Travel pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| 1.6 01, | H209 | Swing pilot pressure sensor abnormal | Swing pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| | H211 | Dozer blade pilot pressure sensor abnormal | Arm-in pilot pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |
| | H401 | Hydraulic oil temperature sensor abnormal | Hydraulic oil temperature collecting volt lower than 0.25V or higher than 4.75V for 3s |
| | H402 | Hydraulic oil temperature high | Hydraulic oil temperature higher than 90°C for 10s |
| | H702 | Shift oil pressure low | After staring machine, Shift valve collecting pressure lower than 28bar. |
| | H703)22 | Brake pressure low | After staring machine, prefill valve collecting pressure lower than 100bar. |
| 1-tedle | H706 | Prefill pressure sensor abnormal | Prefill pressure collecting volt lower than 0.25 and higher than 4.75 for 3s |

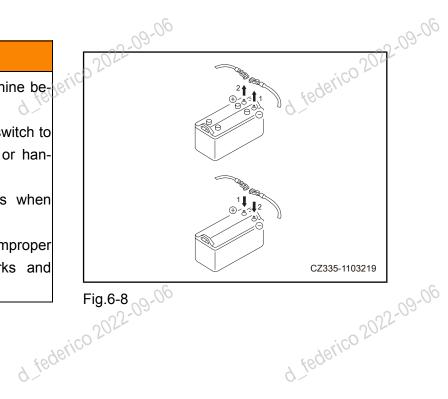
| | 00.06 | 00.06 | 00-06 |
|----------------------------|----------------------------------|---|---------|
| Code | Symptom | Alarm Trigger Condition | 2-09-06 |
| H707 | Shift pressure sensor abnormal | Shift pressure collecting volt lower than 0.25 and higher than 4.75 for 3s | |
| H708 | Brake pressure 1 sensor abnormal | Front brake pressure collecting volt lower than 0.25 and higher than 4.75 for 3s | |
| H709 | Brake pressure 2 sensor abnormal | Rear brake pressure collecting volt lower than 0.25 and higher than 4.75 for 3s | |
| P101 | Engine oil pressure low | Engine oil collecting pressure lower than 200kpa. | |
| P102 | Engine speed high | Engine speed higher than 2500 rpm | |
| P103 Engine speed low | | Engine speed lower than 800 rpm but higher than 400 rpm for 3s | 00-06 |
| P301 | Coolant temperature high | Coolant temperature collecting temperature higher than 103°C. | 2-03 |
| P401 | Fuel level low | Fuel level lower than 10% for 10s | |
| P402 | Fuel level sensor abnormal | Fuel level collecting resistance lower than 10Ω or higher than 120Ω | |
| P501 | Air cleaner plugged | Air cleaner plugging pressure switch off | |
| P802 Engine internal fault | | Engine internal fault alarm. | |

6.4.3 Battery

6.4.3.1 Introduction

WARNING

- Remove the battery from the machine before charging it.
- Stop the engine and turn the key switch to the OFF position when checking or handling the battery.
- Wear goggles and rubber gloves when handling the battery.
- A loose terminal can result in improper contact, which may cause sparks and explosion. d. federico 2022-09



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- 6.4.3.2 Battery removal and installation

 Disconnect the grounding and installation Disconnect the grounding cable (generally) the one in connection with the negative terminal (-)) before removing the battery.
 - Sparks can occur if your tool touches the positive terminal and the chassis.
 - Secure the battery with clamping plates when changing the battery.
 - Always disconnect the ground cable (negad_federico 2022-09-06 tive terminal (-)) first when removing the battery; always connect the positive terminal (+) first when installing the battery.

6.4.3.3 Battery charging

Improper handling can result in explosion when charging the battery. Follow the instructions below:

- Regulate the charger to the voltage applicable to the battery. Incorrect voltage can over heat the charger and cause explosion.
- Connect the charger's positive clip (+) to the battery's positive terminal (+). Connect the charger's negative clip (-) to the battery's negative terminal (-). The wire clips must be fixed.
- Regulate the charging current to 1/10 of the rated capacity of battery. In case of quick charging, regulate the charging cur- rent to a level below the rated capacity of battery. Larger charging current may cause leakage or evaporation of electrolyte, hence fire and explosion.
- If the battery electrolyte freezes, do not a frozen battery may cause electrolyte to catch on fire and the battery to explain

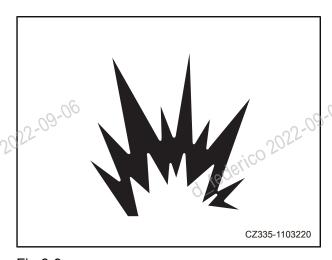


Fig.6-9





6.4.3.4 Starting engine with jumper cable

WARNING

- Never let the positive pole (+) contact with the negative pole (-) when connect- ing the cables.
- Keep the normal machine away from the faulty one to prevent sparks around the battery which may ignite the hydrogen released from the battery.
- Avoid mistakes in connection of the jumper cable. Its final connection with upper structure of the machine can produce sparks. In this case, the battery shall be connected to a location that is far enough from the battery.
- When removing the jumper cables, take care not to allow the cables clips to contact with each other or with the chassis.



Fig.6-10

NOTE:

- federico 2022-09-06 The start system of the machine is sup-plied with a 24V power source. Two 12V batteries are connected serially to supply power under normal operating conditions.
- The sizes of jumper cables and clips shall match the battery.
- The battery of the starting machine shall have the same capacity as the engine to be started.
- Check the cables and clips for damage or corrosion.
- Make sure that the cables and clips are con-
- Check if all control levers are neutralized.

Starting engine





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CAUTION

- 02022-09-06 Check the machine and make sure the hydraulic lockout lever is placed in the "LOCKED" position and all the control levers are neutralized.
- 1. Make sure the clips are firmly connected with terminals of the battery.
- 2. Start the engine of the good machine and
- 3. Turn the start switch of the faulty machine to "START" position and start the engine. If the engine fails to start, wait for two minutes before attempting to restart it.

Connecting jumper cables

Turn the start switches of the normal machine and the faulty one to OFF position. Connect the jumper cables in the numbered sequence, as shown in the diagram

- 1. Connect the clip of jumper cable (A) to the positive terminal (+) of battery (C) of the faulty machine.
- 2. Connect the clip on the other end of jumper cable (A) to the positive terminal (+) of battery (D) of the normal machine.
- 3. Connect the clip of jumper cable (B) to the negative terminal of battery (D) of the normal machine.
- d federico 2022-09-06 4. Connect the clip on the other end of jumper cable (B) to the swivel frame (E) of the faulty machine. Jifederico



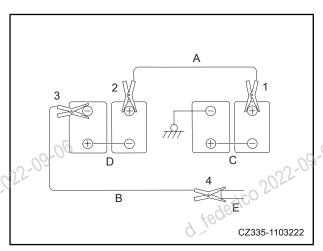


Fig.6-11



Disconnecting jumper cables

After the engine is started, disconnect the jumper cables in steps reversed to their connection.

- 1. Disconnect the clip of the jumper cable (B) from the swivel frame (E) of the faulty machine.
- 2. Disconnect the clip of the jumper cable (B) from the negative terminal (-) of battery (D) of the normal machine.
- the positive terminal (+) of battery (D) of the normal machine.
- 4. Disconnect the clip of jumper cable (A) from the positive terminal (+) of battery (C) of the faulty machine.

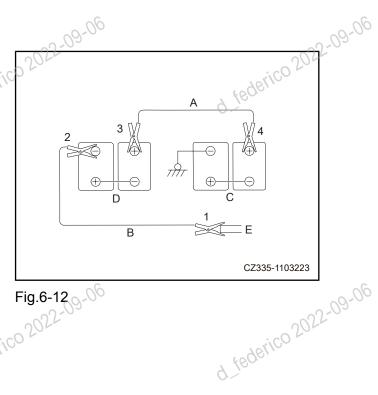


Fig.6-12

6.5 Failures of the Hydraulic System

- Trouble-shoot the hydraulic system according to the following tables. Contact your Sany distributor solve the problem.
- Set the working mode to S and the fuel control dial to position 10 before troubleshooting

| Failure | Causes | Remedy |
|--|---|--|
| Work equipment moving slowly, or travel and swing speed slow | Bad adjustment or main relief valve failure Pilot relief valve failure Regulator failure Plunger pump failure | ReplaceReplaceRepair/replaceCheck/repair |
| Work equipment, final drive or swing drive not functioning | Pilot pump relief valve failureHydraulic pump failureCoupling failure | Replace Check/repair Check/repair |
| Abnormal noise in hydraulic pump | Hydraulic oil level low Bad hydraulic oil Hydraulic tank cap vent plugged Hydraulic tank filter screen plugged | Refill hydraulic oil Use suitable hyd oil Clean/replace Clean/replace Check/repair |

| 20-00 | 20.00 | |
|--|---|---|
| Failure | Causes | Remedy |
| -derico | Plunger pump failure | i derico " |
| Auto idle not functioning | Sensor failurePilot valve failureController failure | Replace Replace Repair/replace |
| Boom speed slow | Right pilot valve (boom circuit) failure Pressure sensor failure Boom control valve (spool) failure Boom control valve (retaining valve) failure Boom control valve (Safety valve and feed valve) seal failure Boom cylinder failure | Check/repair Replace Repair/replace Repair/replace Repair/replace Check/repair |
| Arm speed slow | Left pilot valve (arm circuit) failure Pressure sensor failure Arm control valve (spool) failure Arm control valve (regeneration valve) failure Arm control valve (Safety valve and feed valve) or seal failure Arm cylinder failure | Check/repair Replace Repair/replace Repair/replace Repair/replace Check/repair |
| Bucket speed slow | Right pilot valve (bucket circuit) failure Pressure sensor failure Bucket control valve (spool) failure Bucket control valve (regeneration valve) failure Bucket control valve (Safety valve and feed valve) or seal failure Bucket cylinder failure | Check/repair Replace Repair/replace Repair/replace Repair/replace Check/repair |
| One cylinder of work equipment not working | Pilot valve failure Pressure sensor failure Work equipment control valve (spool) failure | Check/repair Replace Repair/replace |
| Work equipment cylinder drifting excessively | Work equipment cylinder failure Retaining valve (of boom or arm) failure | Replace Repair/replace Repair/replace Repair/replace Repair/replace Repair/replace |

| 00-00 | 00 | _06 | dy : 50 | ~O\- |
|--|---|---|-----------------|------|
| Failure | Causes | Reme | dy | .05 |
| 1 federico 20 | Work equipment control valve (safety valve and feed valve) seal failure Work equipment valve spool failure | | d federico zue | |
| Work equipment sluggish | Arm regeneration valve failure Control valve (safety valve and feed valve) failure | Repair/replace Repair/replace | | |
| Otherworkequi pmentmoves when single cylinder is in relief. | Control valve seal failure | ●Replace | 01 | -09 |
| Machine runs out during travel | Travel pilot valve failure Pilot relief valve failure Travel low pressure failure Main valve travel spool failure Travel motor relief valve failure Travel electronic valve failure Steering shift lever failure Shift valve line failure Speeding changing box failure | Repair/replace Replace Replace Repair/replace Repair/replace replace Repair/replace Repair/replace Repair/replace Repair/replace | d federico 2022 | |
| Travel speed slow | Travel pilot valve failure Pilot relief valve failure Travel low pressure sensor failure Main valve travel spool failure Travel motor relief valve failure | Repair/replace Repair/replace Repair/replace Check/repair | d tederico 2022 | .09 |
| Machine steering difficult | Steering gear failureDuplex gear pump failureCenter swivel joint failure | ReplaceReplaceRepair/replace | 97,0 | |
| Unable to shift travel speed | Steering shift lever failureShift valve line failureShift valve failure | Check/ReplaceCheck/ RepairCheck/ Replace | | |
| Brake fails | Brake valve failure Prefill valve failure Brake accumulator failure Duplex gear pump failure Bridge friction plate failure | Repair/replace Repair/replace Repair/replace Check/repair Replace | d federico 2022 | .09· |
| Un In both directions | Swing motor (parking brake) failure Misadjustment or failure of swing motor (safety valve) | Check/repairAdjust/replaceCheck/repairCheck/repair | d federico | |

| | 00-00 | 20,00 | |
|--|---|---|--|
| | Failure | Causes | Remedy |
| swin g | | Swing motor failure Swing drive failure | d federico so |
| | In one direction | Pilot valve failure Swing control valve (spool) failure Swing motor (feed valve) seal failure | Repair/replaceRepair/replaceReplace |
| Swi | Acceleration performance bad | Swing motor (parking brake) failure Misadjustment or failure of swing motor (safety valve) Swing motor failure Brake control line blocked | Check/repair Adjust/replace Check/repair Remove obstruction or replace the pipeline. |
| ng spe ed slow | Bad acceleration performance on one side or swing speed slow | Pilot valve failure Swing motor (pressure compensation valve) fail ure Swing motor (feed valve) seal failure Leak on one side the shuttle valve of swing pilot pressure sensor | Repair/replace Repair/replace Replace Repair/replace |
| Too muc h | In both directions | Bad adjustment or failure of swing motor (safety valve)Swing motor failure | Adjust/replace Check/repair |
| over run in swin g stop pag e | In one direction | Pilot valve failure Swing control valve (spool) failure Swing motor (feed valve) seal failure | Repair/replace Repair/replace Replace |
| | nuch jerk in g stoppage | Swing pilot valve failureSwing anti-jerk valve failureSwing relief valve failure | Repair/replace Repair/replace Repair/replace |
| • | abnormal noise ing stoppage | Back pressure valve failure Swing motor (safety valve) failure Swing motor (feed valve) failure Swing system mechanical failure | Repair/replace Repair/replace Repair/replace Repair/replace Check/repair |

| | 20-06 | 00 | .06 |
|---|-----------------------------------|--|--|
| | Failure | Causes | Remedy |
| Ex ces sive | When swing brake engaged | Swing brake control line failureSwing motor (parking brake)failure | Check/repair Repair/replace |
| hy drau lic drift of swin 9 | When swing brake disengaged | Swing control valve (spool) failure Swing motor (relief valve) failure Swing motor (feed valve) failure | Repair/replaceRepair/replaceRepair/replace |

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6.6 Other Common Failures

| 6.6 Other Commo | :02022 | - d federico 2022-C |
|---|--|--|
| Failure | Causes | Remedy |
| Structure member noise loud | Loose fastenerBigger clearance between arm and bucket end faces due to wear | Check and retighten. Reduce the clearance to a value that is smaller than 1mm. |
| Bucket tip falls off during operation. | Spring deformed and weak due to repeated use of bucket tip pin Bucket tip pin not matching the adaptor | Replace bucket tip pin |
| Fan not working | Improper electrical connection or connector contact Air flow control switch, relay or temperature control switch damaged Fuse exploded or battery voltage low | • Repair/replace. |
| Fan running but producing less air flow | Air intake side blocked Evaporator or condenser fin plugged, giving ineffective heat conduction Fan vane seized or damaged | Clean/replace |
| Compressor not working or working with difficulty | Compressor clutch not picking up due to wire break or defective contact of electrical circuit Loose compressor belt Wire break or failure of compressor clutch coil Insufficient or excessive refrigerant | Repair Adjust the tension of compressor belt Replace clutch coil Refill/drain the refrigerant to a suitable level |
| Refrigerant insufficient | Refrigerant leaks. Insufficient refilling | Eliminate the leaking point. Refill suitable amount of refrigerant. |
| High/low pressure reading in normal operation | Ambient temperature: 30~50°C High pressure gauge: 1.47~1.67N Low pressure gauge: 0.13~0.20N | • |
| Low pressure tube surface gauge reads | Expansion valve opening excessively. Defective contact of expansion valve thermo-bulb Excessive refrigerant in the system | Replace expansion valve. Install thermo-bulb correctly. Drain refrigerant to the specified level. |

| | 30.06 | ~0. | .06 | 2-09-08 | |
|--|---|--|--|---------|--|
| Failure | | Causes | | 2-03 | |
| high er. | ÇO F | d federico so | d federico do | | |
| Low pres sure | Both high and low pressure gauge readings lower the standard value. | Refrigerant insufficient | Refill refrigerant to the specified level. | | |
| gauge reads lower. | Low pressure gauge could read negative. | Low pressure hose blocked; expansion valve blocked by ice or contaminants. | Repair the system. Replace reservoir in case of ice blockage. | 06 | |
| | Evaporator frozen | Thermostat failure | Replace thermostat. | 2-09-0E | |
| 100 | sion valve inlet ol and frosted. | Expansion valve blocked. | Clean/replace expansion valve. | | |
| Expansion valve outlet is not felt cool. Low pressure could be negative. | | Expansion valve thermo-tube or bulb leaks. | Replace expansion valve. | | |
| High pres sure gauge | Both high/ low pressure gauges read higher than standard value | Air trapped in circulation system. Excessive refrigerant refilled. | Empty the system and vacuate to refill refrigerant. Drain refrigerant to the specified level. | 2-09-08 | |
| reads high er. | Bad condensing effect of condenser. | Condenser blocked by dust or debris Condenser fan damaged | Clean the condenser. Check/replace condenser fan. | | |

d. federico 2022-09-06

d_federico 2022-09-06



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|------|-----------------------------------|---|---|--|
| | 2 | Failure | Causes | Remedy |
| 1,50 | High pres sure gauge reads lower. | Both high/ low pressure gauges read lower than standard value. Low pressure is negative sometimes. Condenser and high pressure tube | Refrigerant insufficient Low pressure line blocked/ damaged Compressor internal failure | Refill refrigerant as required. Clean/replace damaged component. Replace compressor. |
| | | a r e hot | 222-09-0 | 055-03- |
| , 48 | 10110 | rigerating effect ive heater | Hot water valve damaged and can't be closed | Replace hot water valve. |

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