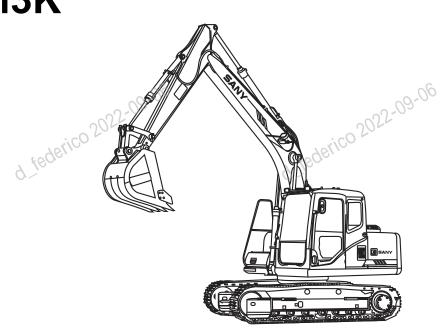


Crawler Hydraulic Excavator

SY215CCM3K



d_federico 2022-09-06

d. federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06



SY215CCM3K Hydraulic Excavator

Operation and Maintenance Manual

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

WARNING

Please read and follow the safety precautions and instructions in this manual and on the machine nameplate. Otherwise, severe injuries, deaths or property loss may occur. Please keep this manual together with the machine for future reference.

d federico 2022-09-06

d. federico 2022-09-06

d. federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

Sany Heavy Machinery Limited.

Sany Industrial Park No. 318, Lianggang Avenue, Fengxian District, Shanghai

Post code: 201413

http://www.sany.com.cn

Fax: 021-57001222

Sales hotline: 021-57001111

After-sale service hotline: 4008 28 2318

d. federico 2022-09-06 Consultation and complaint telephone: 4008 28 2333 d federico

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

Since our technologies and products are constantly updated, materials and technical specifications are subject to change without prior notice. Copyright © 2013 Sany Group, no part of this manual may be reproduced, transmitted, sold or altered without the written permission of Sany Group.

d federico 2022-09-06

d. federico 2022-09-06

d. federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

Responsibility Division

Important statements

The crawler hydraulic excavator is a multipurpose machine for earthwork construction, intended for earth excavation and loading, land leveling, slope finishing, hoisting, crushing, demolition, ditching, and widely applied in highway and railway construction, bridge construction, urban construction, and construction of airports, ports and water conservancy. The machine has the features of bulldozers, loaders and cranes, and can replace them during operation. The machine is not intended for other purposes than those designated. We do not accept any responsibility for any consequence of use for purposes other than those designated.

d_federico 2022-09-06

We do not accept any responsibility for the following:

- Consequences of failure to correctly use the machine according to the instructions in the manual.
 - Consequences of unauthorized retrofitting or modification of the machine.
 - Equipment damage or accidents caused by failure to use genuine accessories or use of untested or unauthorized accessories or tools.
 - Machine faults or damage because of nature disasters (earthquakes, typhoons, etc.), wars and other force majeure.

We cannot foresee all risks that may occur at the working site; therefore, the machine operators and customers shall pay high attention to safety issues.

The regions where the machine is used and their local governments may have stricter operation federico 2022-09 regulations which shall be observed if they conflict with these rules for safe operation.

Responsibilities of our manufacturer

- Ensure that the machine quality is acceptable and accompanying documents are accurate.
- Fulfill the after-sales service commitment, and document all the maintenance and repair work performed by after-sales service personnel.
- Provide trainings to the equipment operators and maintenance staff as required.

Responsibilities of customers or other authorized personnel concerned

- Personnel concerned shall be well trained and fully acquainted with the Parts Catalogue and the Operation and Maintenance Manual before the machine operation and maintenance.
- Make sure that personnel engaged in machine operation and maintenance are competent and d_federico 20 aware of their respective responsibilities.
- Regularly inspect the safety awareness of personnel concerned in working.
 - Immediately stop the machine in the event of any fault influencing safety.



- Our service personnel have the right to carry out the relevant safety inspection on the machine when necessary.
- Besides inspection specified by Sany, carry out the relevant inspection according to the related regulations of the country or region where the machine is used.
- Make sure that the machine is subject to timely maintenance and repair.
- Make a plan for the machine operation carefully and consciously.

Responsibilities of all the operation personnel

- In the event of any abnormalities that may cause abnormal operation of the machine or pose a potential risk, timely report them to the supervisor, and rectify them in time if possible.
- ²⁰ 2022-09-06 All staff working around the machine must obey all the warning signals and caution for safety of themselves and others.
- All the operation personnel shall be acquainted with the work content and procedures.
- Observe whether there are dangerous situations such as high voltage wires, irrelevant personnel, poor ground condition, and timely warn the operators and signalmen of them?

Responsibilities of management

Make sure that the machine operators are well trained, fully understand the content of this manual, enjoy good health and possess the operation certificate.

- Make sure that the machine operation or maintenance is carried out by operators with good judgment, cooperation consciousness and psychological quality only.
- Make sure that signalmen have good visual and audible judgment, know well standard commanding signals and send clear and accurate signals, and possess rich experience in hazard identification and instruct operators to avoid hazards in time.
- Make sure that assistants can correctly determine the machine model and working condition, and choose an appropriate machine.
- Assign the corresponding safety responsibility to each operation personnel and ask them to timely report unsafe factors to the supervisor.







Table of Contents

Table of the derico 2022-09-06	of Conter	nts d. federico	-072-09
inderico 201 TADIC	derico Conten	iro ^{coge} ico	500
d le		9 160	4 4
1 1 016W01 d			1 - 1
1.1 General			
1.2 Safety information			
1.3 Page description			
1.4 Introduction			
1.4.1 General 1.4.2 Directions of the machine			
1.4.2 Directions of the machine			1-/ 4 7
1.4.3 Running-in of new machines .	0.00		/-1 م-1
1.4.3 Running-in of new machines . 1.5 Product information 1.5.1 General 1.5.2 Machine data plate	-02-05		
1.51) General	:/CO 2015	905	۵-۱ <u></u>
1.5.2 Machine data plate	98//	, f69 <u>5</u> 1/2	3-1
2.1.1 General 2.1.2 Location			
2.1.2 Location			2-5
2.1.3 Description			
2.2 Safety information			2-14
2.2.1 Safety rules			2-14
2.2.1 Safety rules	-02-09		2-14
2.2.3 Personal protective equipmen	ıt	0.5	2-15
2.2.4 Fire extinguisher and first-aid 2.2.5 Safety equipment	kit	, 16961,	2-16
2.2.6 Keeping the machine clean			
2.2.7 Keeping the cab clean			
2.2.8 Locking of safety lock control			
2.2.9 Armrest and ladder			
2.2.10 Precautions for working at he	•		
2.2.11 Keeping clear of the accesso	=		
2.2.12 Don't get stuck in the articula	AUON SECUON		2-20
2.2.13 Preventing scald	0.09.00		2-20
Z.Z. 15.1 Hot coolant	2021-2		2-20
2.2.13.2 HOt OII			2-21
2.2.13 Preventing scald	//I	9>	2-21
2.2.14.11 lie caused by luci of el	igirie oii		2-2 1
2.2.14.2 Fire caused by inflamma	able materials		2-22

- 06	06
2.2.14.3 Fire caused by electrical wire	2-22)
2,2014.4 Fire caused by hydraulic circuit.	2-22
2.2.14.5 Fire caused by lighting equipment	2-23
2.2.14.6 Fire caused by heat shield	2-23
2.2.15 Actions in case of a fire	
2.2.16 Windshield cleaning solution	2-23
2.2.17 Preventing flying components	
2.2.18 Prevent falling, flying and invading objects	2-24
2.2.19 Accessory installation	2-24
2.2.20 Accessory combination	2-25
2.2.21 Cab window glass	2-25
2.2.22 Unauthorized retrofit 2.2.23 Site survey in advance 2.2.24 Operation on loose ground	2-25
2.2.23 Site survey in advance	2-25
2.2.24 Operation on loose ground	2-26
2.2.25 Don't approach high voltage cable	2-27
2.2.26 Ensuring favorable view	2-28
2.2.27 Ventilation of working environment	
2.2.28 Prevention of asbestos dust	
2.2.29 Cab emergency exit	
2.3 Safe machine operation	
2.3.1 Start	
2.3.1.1 Boarding the machine safely	
2.3.1.2 Adjusting the seat	2-31
2.3.1.3 Fastening safety belt	2-31
2.3.1.4 Inspection before engine start	2-31
2.3.1.5 Starting the machine safely	2-32
2.3.1.6 Engine start in cold weather	2-33
2.3.1.7 Required auxiliary equipment for start	2-33
2.3.1.8 After starting the engine	2-34
2.3.2 Operation	2-34
2.3.2.1 Check before operation	2-34
2.3.2.2 Precautions before operation	2-35
2.3.2.3 Verifying the travel direction	2-35
2.3.2.4 Safety rules for changing the machine direction	2-36
2.3.2.5 Travel safety rules	2-38
2.3.2.6 Driving the machine safely	2-39
2.3.2.5 Travel safety rules	2-41
2.3.2.8 Operation in snowy weather	2-41
2.3.2.9 Forbidden operation	

2.3.3 Parking	2-00
2.3.3 Parking	2-44
2.3.3.1 Choosing parking lot	2-44
2.3.3.2 Machine shutdown	2-45
2.3.4 Transportation	2-45
2.3.4.1 Transportation	2-45
2.3.4.2 Loading and unloading	2-46
2.3.5 Battery	2-47
2.3.6 Towing	2-49
2.3.7 Lifting by excavator	2-50
2.4 Safe maintenance instruction	2-51
2.4.1 Precautions before maintenance	2-51
2.4.2 Self-preparation	2-51
2.4.2 Self-preparation	2-52
2.4.4 Steps of engine shutdown before maintenance	2-53
2.4.5 Warning decal	2-54
2.4.6 Proper tools	2-54
2.4.7 Maintenance during engine running	2-55
2.4.8 Operation under the machine	2-55
2.4.9 Track maintenance	2-56
2.4.10 Safety precautions for track tension adjustment	2-57
2.4.11 Don't remove the buffer spring	2-57
2.4.12 Be careful of hot cooling system	2-58
2.4.13 Safe operation of high pressure hose	2-58
2.4.13 Safe operation of high pressure hose 2.4.14 Be careful of high pressure liquid	2-59
2.4.15 Welding operation	2-60
2.4.16 Safe maintenance of HVAC group	2-60
2.4.17 Precautions related to high voltage	2-61
2.4.18 Accumulator	2-61
2.4.19 Preventing the danger of fire and explosion	2-61
2.4.20 Regular replacement of safety related parts	2-62
2.4.21 Maintenance operation	2-62
2.4.22 Proper waste treatment	2-63
3 Technical Specifications	3-1
3.1 Overall dimensions 3.2 Working range 3.3 Technical parameters 4 Operation	3-3
3.2 Working range	3-4
3.3 Technical parameters	3-5
teurs "Salerice	regerice
4 Operation	4-1
4 1 General drawing of machine	4-5

6	06
4.2 Description of controls and instruments	4-6)-09-00
4 2 1 Display	4-6
4.2.2 Operation method of each page of the display	4-10
4.2.3 Control panel and switches	4-21
4.2.3.1 General	
4.2.3.2 Ignition switch	
4.2.3.3 Throttle control knob	
4.2.3.4 Working lamp switch	
4.2.3.5 Ceiling lamp switch	
4.2.3.6 Wiper switch	
4.2.3.7 Washer switch	4-28
4.2.3.9 Indoor lamp switch	4-28
4.2.3.10 Cigar lighter and auxiliary power supply	4-28
4.2.3.10 Cigar lighter and auxiliary power supply	4-29
4.2.3.12 Preheating indicator	
4.2.3.13 Charging indicator	
4.2.3.14 Mode selector knob	
4.2.4 Control lever and pedal	
4.2.4.1 General	
4.2.4.2 Safety lock control lever	4-31
4 2 4 3 Traveling control mechanism	4-32
4.2.4.4 Joysticks	4-33
4.2.4.4 Joysticks	4-34
4.2.6 Windshield	4-35
4.2.7 Cab door window	4-42
4.2.8 Cup holder	
4.2.9 Ashtray	4-43
4.2.10 Information pack	4-44
4.2.11 Drink box	4-44
4.2.12 Emergency exit	4-45
4.2.13 Fire Extinguisher	4-45
4.2.14 Controller	4-46
4.2.15 Fuse link	4-46
4.2.16 HVAC group	4-47
4.2.16 Control panel	4.47
4.2.15 Fuse link 4.2.16 HVAC group 4.2.16.1 Control panel 4.2.16.2 Control switch and LCD 4.2.16.3 Operation of A/C	4-47
4.2.16.3 Operation of A/C	4-52
4.2.16.4 Using A/C carefully	4-56

4 2 17 Radio	-A-F
4 2 17 1 Control panel	4-5 4-5
4 2 17 2 Control button and I CD	1-F
4 2 17 3 Radio operation	4-6
	4-6
	4-6
·	4-6
	p with lock 4-6
	ver with lock 4-6
4.2.20 Tool box	4-6
4.2.21 Lubricating grease pump rack (i	f equipped)4-6
4.3 Operation and control of machine	4-6
4.3.1 Before engine start	
4.3.1.1 Walkaround inspection	.co 4-6
4.3.1.2 Inspection before start	4-6 4-6 4-6 4-6 4-6
4.3.1.3 Adjustment before operation	4-7
	t4-8
	4-8
_	4-8
4.3.4 Warm-up operation	4-8
4.3.5 Shutting down the engine	4-8
4.3.6 Machine operation	4-8
4.3.6.1 General	4-8 nachine 4-8 4-9
4.3.6.2 Preparation for moving the m	nachine4-8
4.3.6.3 Moving the machine	4-8
4.3.6.4 Stopping the machine	4-9
4.3.7 Machine steering	4-9
4.3.7.1 General	4-9
4.3.7.2 Turning the machine when it	stops4-9
4.3.7.3 In-situ steering	4-9
4.3.8 Working mode selection	4-9
4.3.9 Control and operation of work	4-9
4.3.10 Prohibited operation	4-9
4.3.11 Allowable water depth	4-9
4.3.12 Operation on a slope	4-9
4.3.12.1 General	4-9 4-9 2024-9 4-10 4-10
4.3.12.1 General	4-10
4.3.12.3 Engine flameout on a slope	4-10
4.3.12.4 Cab door when the machine	e is on a slope4-10

06	00
4.3.13 Driving the machine out of the mud	4-102)
4.3.13.1 General	4-102
4.3.13.2 Tracks on both sides get stuck in the mud	4-102
4.3.13.3 Tracks on both sides get stuck in the mud	4-102
4.3.14 Recommended purpose	4-103
4.3.14.1 General	
4.3.14.2 Backhoe operation	
4.3.14.3 Ditching operation	
4.3.14.4 Loading operation	
4.3.15 Parking	
4.3.16 Machine inspection after daily work	4-108
4.3.18 Operation in cold season	4-108
4.3.18.1 Description of operation in cold season	4-108
4.3.18.2 After daily work	4-109
4.3.18.3 After the cold season	
4.3.19 Long-term storage	4-111
4.3.19.1 Before storage	4-111
4.3.19.2 During storage	4-111
4.3.19.3 After storage	4-112
4.3.19.4 Starting the engine after long-term storage	4-112
4.4 Transportation	4-112
4.4.1 General 4.4.2 Transportation method	4-112
4.4.2 Transportation method	4-113
4.4.3 Machine loading and unloading with trailer	
4.4.3.1 General	4-113
4.4.3.2 Loading	4-114
4.4.3.3 Securing	4-116
4.4.3.4 Unloading	
4.5 Lifting	4-121
5 Maintenance	5_1
5.1 Maintenance Information	
5.2.1 Oil	5-7
5.2 Oil, fuel and coolant 5.2.1 Oil 5.2.2 Fuel 5.2.3 Coolant 5.2.4 Grease	5-8
5.2.3 Coolant	<u>4811</u> 5-8
5.2.4 Grease	5-9
5.2.5 Oil and fuel storage	5-9
5.2.5.1 General	5-9

5.2.5.2 Filter element 5.2.6 Electrical system 5.3 Wear Parts 5.4 Recommended Fuel, Coolant and Lubricant	00-06
5.2.5.2 Filter element	5-10
5.2.6 Electrical system	5-10
5.3 Wear Parts	5-10
5.4 Recommended Fuel, Coolant and Lubricant	5-11
5.4.1 General	5-11
5.4.2 Table of recommended fuel, oil and coolant	5-13
5.4.3 Table of capacities	5-15
5.5 General	5-15
5.6 Safety Critical Parts	
5.7 Maintenance Schedule	5-19
5.8 Maintenance Procedures	5-22
5.8.1 Lockout and tag-out measures 5.8.2 Initial 50 hours of operation 5.8.3 Initial 500 hours of operation 5.8.3.1 Swing drive oil - change	5-22
5.8.2 Initial 50 hours of operation	5-22
5.8.3 Initial 500 hours of operation	.c 5-23
5.8.3.1 Swing drive oil - change	5-23
5.8.3.2 Final drive oil - change	5-24
5.8.4 When Required	5-25
5.8.4.1 Track shoe bolts - inspect/tighten	5-25
5.8.4.2 Track tension - inspect/adjust	5-26
5.8.4.3 Bucket - replace	5-29
5.8.4.4 Bucket tips - replace	5-31
5.8.4.5 Bucket clearance - adjust	5-32
5.8.4.6 Window washer fluid level - check/fill	5-35
5 8 4 8 Ceiling window gas spring - inspect	5-36
5.8.5 Inspection Prior to Startup	5-38
5.8.6 Every 100 service hours	5-39
5.8.6.1 Lubrication	
5.8.7 Every 250 service hours	
5.8.7.1 Air filter element - inspect/clean/replace	
5.8.7.2 Fan belt tension - inspect/adjust	
5.8.7.3 Compressor belt tension - inspect/adjust	
5.8.7.4 Pipe clamps of hydraulic system - check	
5 8 8 Every 500 service hours	5-47
5 8 8 1 Geberal	5-47
5.8.8.2 Swing hearing - Juhricate	075-47
5.8.8 Every 500 service hours 5.8.8.1 Geberal 5.8.8.2 Swing bearing - lubricate 5.8.8.3 Engine pan oil and filter element - change/replace 5.8.8.4 Swing pinion gear grease level - inspect/fill	5-48
5.8.8.4 Swing pinion gear grease level - inspect/fill	5-50
5.8.8.5 Primary fuel filter element - replace	5-51

. 06	06
5.8.8.6 Secondary fuel filter element - replace	5-53
5.8.8.7 Radiator and oil cooler fins - inspect/clean	. 5-56
5.8.8.8 Air conditioner fresh air/recirculation filter - clean	5-58
5.8.8.9 Swing drive oil level - check/fill	
5.8.8.10 Final drive oil level - check/fill	5-61
5.8.9 Every 1000 service hours	5-62
5.8.9.1 General	5-62
5.8.9.2 Hydraulic oil suction filter element - replace	5-62
5.8.9.3 Swing drive oil - change	5-63
5.8.9.4 Cab door lock and front window lock catch - inspect/tighten	5-65
5.8.9.5 Cab door hinge and front window slide rail - inspect/add grease	5-66
5.8.9.6 Windshield wiper arm nut - Inspect/tighten	5-67
5.8.9.7 Engine exhaust pipe clamps - check	. 5-67
5.8.9.8 Fan belt tension - check/replace	5-67
5.8.9.9 Nitrogen pressure in accumulator (breaker) - check	5-67
5.8.9.10 Fan belt tension - check/replace	
5.8.9.11 Nitrogen pressure in accumulator (breaker) - check	5-68
5.8.9.12 Swing mechanism grease - check and add	5-68
5.8.9.13 Hydraulic tank breather valve filter element- replace	5-69
5.8.10 Every 2000 service hours	5-69
5.8.10.1 General	5-69
5.8.10.2 Final drive oil - change	5-70
5.8.10.3 Hydraulic oil suction filter element – clean/replace	5-71 _09_00
5.8.10.4 Nitrogen pressure in accumulator (control oil circuit) - check	5-72
5.8.10.5 Cooling system interior - clean	5-75
5.8.10.6 Alternator - inspect	5-77
5.8.10.7 Engine valve clearance - check/adjust	5-78
5.8.11 Every 4000 service hours	
5.8.11.1 General	5-78
5.8.11.2 Water pump - inspect	
5.8.11.3 Start motor - check	5-78
5.8.11.4 Accumulator - replace	5-78
5.8.11.5 High-pressure tube clamps and rubber - check	5-80
5.8.11.6 Compressor working condition - inspect	5-80
5.8.11.7 Hydraulic tank oil - change	5-81
5.8.12 Every 8000 service hours	5-82
5.8.11.6 Compressor working condition - inspect. 5.8.11.7 Hydraulic tank oil - change	5-82
5.8.12.2 High-pressure tube clamps - replace	5-82
5.8.12.3 Maintenance after every 10000 h	5-82

200	30.0	00.06
5.8.12.4 Maintenance d	uring long-term storage	5-82
:102020	15020	::0202
6 Troubleshooting	1846110	6-1
6.1 Special Instructions	0.2	6-3
6.2 Preparations before Trou	bleshooting	6-4
6.2.1 Inspections before to	oubleshooting	6-4
6.2.2 Precautions for trout	oleshooting	6-6
6.2.3 Precautions for circu	iit troubleshooting	6-7
6.2.4 Precautions for hand	dling hydraulic components	6-7
6.2.5 Towing		6-9
6.3 Engine Faults		6-11
6.3.1 Faults diagnosis tab	le of engine	6-11,00
6.3.2 High water temperat	ure	6-17
6.3.3 Abnormal engine oil	pressure (low pressure)	6-18
6.3.4 Fuel run-out	7.600	6-19
6.3.5 Engine kick-back		6-20
6.4 Electrical System Failure		6-21
6.4.1 Faults diagnosis tab	le of electrical system	6-21
6.4.2 Display monitor		6-24
6.4.3 Battery		6-27
6.4.3.1 General		6-27
6.4.3.2 Removal and re	fitting of battery	6-27
6.4.3.3 Battery charging	J	6-28
6.4.3.4 Start engine with	n auxiliary wire	6-29
6.5 Hydraulic system fault	auxiliary wire	6-31
6.6 Other common faults	d federico s	6-35
9 fee	9 fee	9 jec
7 Accessories and opti	ons	7-1
7.1 Safety precautions		7-3
7.2 Hydraulic control compor	ents and lines supporting accessories.	7-5
7.2.1 Position of compone	nts	7-5
7.2.2 Hydraulic lines		7-6
7.2.3 Removal and installa	ation of accessories	7-9
7.2.4 Replacement of hyd	raulic fluid and hydraulic tank filter	7-13
7.2.5 Long-term storage		7-1 <u>4</u> 6
7.3 Combinations of work eq	uipment	7 ₋ -15
7.4 Recommended accessor	y operation	7.7-17
7.4.1 General	uipmenty operation	7-17
7.4.2 Hydraulic breaker	9.7	7-18
7.4.3 Operation of hydrau	lic breaker	7-18

20-00		20-00	20-0
7.4.4 Forbidden operation		-02	7-20
7.4.5 Greasing of hydraulic	c breaker		7-22
/ Souther and control	system		(-/.3
7.5.1 Operation method of	quick coupler		7-23
7.5.2 Precautions for safet			
7.6 Refueling system			7-26
7.6.1 Introduction to refuel	ing system		7-26
7.6.2 Composition of refue	ling system		7-27
7.7 Centralized lubrication sys			
7.7.1 System scheme and	composition		7-27
7.7.2 System working princ	ciple		7-29
7.7.3 Lubrication time setti	ng of electric grease pu	g	7-30 ₀₀ 0
7.7.4 System technical spe	ecification	, 200	7-32
7.7.5 Refilling method of e	lectric grease pump		7-32
9 tege,	d teas,		d lege,

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

Foreword

1 Foreword	200-00	1-9-0
1.1 General	20/1	1-3
1.2 Safety information	tegelin.	1-4
1.1 General	97,0	1-6
1.4 Introduction		1-6
		1-6
		1-7
1.4.3 Running-in of new mad	chines	1-7
1.5 Product information		
1.5.1 General		1-8
1.5.2 Machine data plate		1-8
1.5.3 Engine data plate	00,	1-8 0
d federico 2022	2022-09	d. federico 2022-09-0
to derico	derico	aderico co
die	d tec	d tec

d. federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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

d federico 2022-09

1.Foreword

1.1 General

d federico 2022-09-06 d_federico 2022-09-06 This manual is a guide for correct use of the machine and mainly provides technical and safety information required in operation. Please be sure to read each part of it carefully.

Only qualified and experienced operators with an official license (according to local laws) can operate the machine.

Make sure that the relevant laws and regulations of the state, a province, an autonomous region or a municipality are always observed in operation of the machine, and the operation safety information and instructions contained herein are only provided as suggestions and cautions.

We cannot foresee all situations in operation and maintenance that may pose risks. Therefore, the safety information in this manual and on the machine do not contain all the possible safety measures. When methods or actions other than those specifically recommended or allowed in this manual are used or taken, you are obliged to take necessary measures to ensure safety.

Unauthorized retrofitting or abuse of the machine may influence the performance or even cause greater safety hazard, for instance, settings more than the specified fuel quantity may overload the machine. Please drive and use the machine carefully, as faulty operation and misuse may also cause damage, and we do not accept any responsibility for the loss thus caused.

The machine referred to in this manual is used for various operations under normal conditions; please do not use it in an inflammable and explosive place or an area with asbestic dust.

During running at an altitude of higher than 2,000 m, the controller automatically adjusts the engine and main pump power to adapt to high altitude conditions.

This machine is subject to the electromagnetism and capacitance test according to EN 13309-2000. Therefore, all the unapproved electronic auxiliary devices such as communication apparatus shall be tested before installation and use to ensure that they will not produce electromagnetic interference to the machine.

All data, charts and specifications in this manual are the latest product information available at the time of publication. We reserve the right to alter the above information without notice. Please contact us or our authorized dealer for the latest product information or the problems related to the information covered in this manual.

d federico 2022-09-06 Scope of application of machine of standard version: altitude below 2,000 m, atmospheric temperd federico 2022-09 d federico 202 ature of -20°C ~ +40°C.



CAUTION

Before operation and maintenance, the operators and maintenance personnel must do the following:

- Be sure to read through and understand this manual.
- Read and fully understand the safety notices in the manual and safety labels on the machine.
- Shall in no circumstances use the machine for applications or operations forbidden in the manual.
- The fuel amount, particulate size or latitude that exceeds the upper limit specified for the model and application, may result in injuries and is not covered under the warranty.
- Always keep the manual in the cab for reference at anytime.
- Immediately contact our authorized dealer for reissue or replacement if this manual is lost or stained and thus unreadable.
- This manual shall be deemed as a permanent part of the machine, so please be sure to hand it over to a new user together with the machine if you resell it.
- Hydraulic excavators that are sold by Sany Heavy Machinery Co., Ltd. to the country of purchase meet all applicable regulations and standards. Purchasing from another country or a person of another country may deprive you of some safety devices and specifications necessary for use in your country. If you have any questions about hydraulic excavator's compliance with national standards and regulations for use, contact your Sany Heavy Machinery Co., Ltd. authorized distributor before using it.

1.2 Safety information

For safe use of the machine, this manual contains and explains the safety precautions and labels attached to the machine, to provide a description of potential hazards involved and methods to avoid them. avoid them.

Before operation and maintenance, users and after-sales service personnel must get familiar with the warning signs and symbols on the machine, strictly observe the safety rules and recommendations in this manual, and actively take safety precautions and countermeasures to minimize the risks of personal injuries, machine damage due to improper repair or the risks due to unsafe factors.

1. Safety warning

A safety warning comprises an attention symbol and signal words, used as a reminder of potential hazards that may cause personal injuries or damage. Safety warnings can be classified by signal ico 2022-09-06 words according to the severity of hazardous situations.

Three types of signal words are used in this manual: DANGER, WARNING and CAUTION, each representing the following:



Existing dangers that, if not evaded, will cause deaths or severe injuries.

Potential dangers that, if not evaded, may cause deaths or severe injuries.

Potential dangers that, if not evaded, may cause light or moderate injuries "CAUTION" statements may also be used in some occasions as a reminder of unsafe operations that may cause personal injuries, damage to the machine and environment. Examples of safety warnings

WARNING

- Before standing up from the driver seat, make sure to set the control lever to the LOCK position.
- Severe injuries or deaths can occur if the control lever is not locked and touched by accident.

2. Safety decals

A safety decals is attached to the machine to remind the operators or maintenance personnel of potential hazards during operation or maintenance.

The "literal safety decals" and "graphic safety decals" are used on the machine to represent safety measures.

a. Examples of literal safety decals



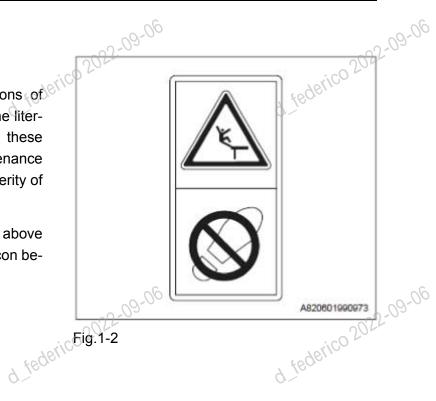
d.federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

Safety icons are graphic representations of the severity of hazards, equivalent to the severity of hazards. safety icons to keep operators or maintenance personnel informed of the type and severity of hazards.

In the figure on the right, the safety icon above represents the type of hazard and the icon below indicates the method to avoid it. federico 2022-09-06



1.3 Page description

For the purpose of this manual, the page is numbed by chapter.

Example: 3-20 Page 20 in Chapter 3 d_federico 2022-09-06 Chapter 3

1.4 Introduction

1.4.1 General

Sany hydraulic excavator is designed for:

Excavation

Leveling

Ditching

Demolition 2022-09-06

federico 2025-09-06 Please refer to the relevant part of this manual in detail.

Numbers in illustrations are corresponding to those in [] in the text. (Example: $1 \rightarrow []$)

d_federico 2022-09-06

The international system of units (SI) is used in this manual.

1.4.2 Directions of the machine

In this manual, the front, back, left and right are directions of travel when seen from the cab with the cab facing forward and the driving wheel behind the machine.

- [A] Front
- 【B】Rear
- [C] Left
- [D] Right
- Driver seat
 - (F) Driving wheel

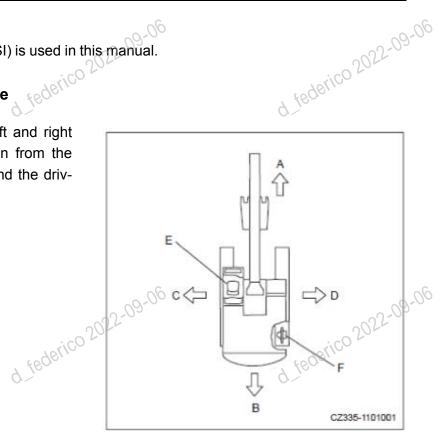


Fig.1-3

1.4.3 Running-in of new machines

Our machines are fully commissioned and tested before delivery. However, keeping machines at full load before running-in process will seriously affect the performance and shorten the useful life.

Be sure to carry out running-in within the initial 100 h (according to the indication of working hours on the display).

Make sure that you are fully aware of the content of this manual and notice the following during the running-in process:

After start-up, keeping the machine idling for $3 \sim 5$ min. During this time, do not operate the control lever or throttle control knob, but slowly increase the engine speed to 1,500 rpm until the coolant temperature reaches about 60° C.

Avoid high-speed operation at heavy load.

Avoid abrupt engine start, and do not accelerate or shut down the engine or change the machine direction abruptly after engine start.

1.5 Product information

1.5.1 General

d_federico 2022-09-06 d federico 2022-09-06 To maintain, order or replace components, please inform our authorized dealer of the following:

1.5.2 Machine data plate

The machine data plate is at lower right of the cab (as shown below).

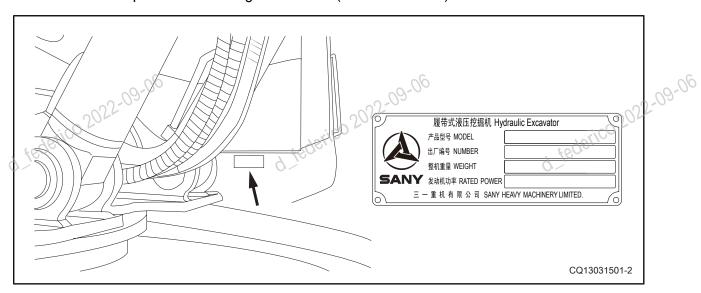


Fig.1-4

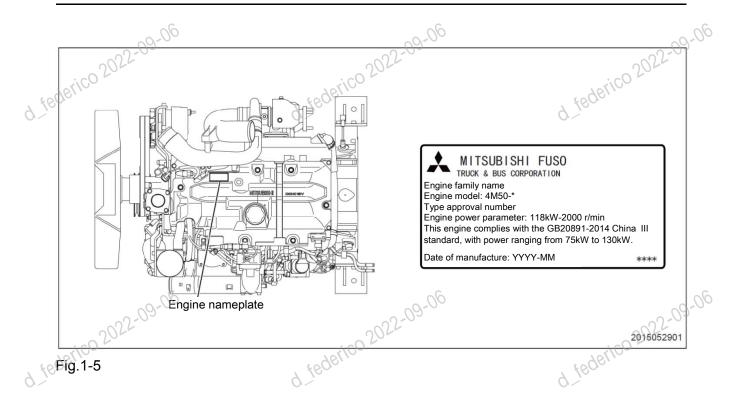
1.5.3 Engine data plate

1.5.3 Engine data plate

The engine data plate is located as shown below. The location of the engine data plate may vary with the engine type. d federico

d_federico 2022-09-06

d_federico 2022-09-06



d. federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d tederico 2022-09	9 <u>isqs.ico</u>	2022-09-06	d federico 2022-09-06
3 10deii/co 2022-09	06 <u>7.6081</u> ,60	2022	d. jederico 2022-09-06
1 1 8 0 8 1 i CO 2022 0 9	.06 J. 180erico	2022-09-06	9-06 g-federico 2022-09-06
d federico 2022 09	d federico	2022-09-06	d. federico 2022-09-06

Safety

2 Safety	-03-08	
2.1 Safety decals	:/CO,/Do	2-5
2.1.1 General	1 feger,	2-5
2.1.2 Location	0	2-5
2.1.3 Description		2-8
2.2 Safety information		
2.2.1 Safety rules		2-14
2.2.2 Handling of abnormalit	ies	2-14
2.2.3 Personal protective eq	uipment	2-15
2.2.4 Fire extinguisher and f	irst-aid kit	2-16
2.2.5 Safety equipment		2-16
2.2.6 Keeping the machine of	clean	2-17
2.2.7 Keeping the cab clean	2022-0	
2.2.8 Locking of safety lock	control lever	2-18
2.2.9 Armrest and ladder	9.1600	2-19
2.2.10 Precautions for worki	ng at heights	2-20
2.2.11 Keeping clear of the a	accessory	2-20
2.2.12 Don't get stuck in the	articulation section	2-20
2.2.13 Preventing scald		2-20
2.2.13.1 Hot coolant		2-20
2.2.13.2 Hot oil		2-21
2.2.14 Fire and explosion pr	evention	2-21
2.2.14.1 Fire caused by fu	el or engine oilflammable materials	2-21
2.2.14.3 Fire caused by el	ectrical wire	
2.2.14.4 Fire caused by h	ydraulic circuit	2-22
2.2.14.5 Fire caused by lig	ydraulic circuit ghting equipment	2-23
	eat shield	
2.2.15 Actions in case of a fi	re	2-23

			20
	2.2.16 Windshield cleaning solution	2-23-09	1-00
	2.2.17 Preventing flying components	2-23	
6.0	2.2.17 Prevent falling, flying and invading objects	2-24	
9 7	2.2.18 Prevent falling, flying and invading objects	2-24	
	2.2.20 Accessory combination	2-25	
	2.2.21 Cab window glass		
	2.2.22 Unauthorized retrofit		
	2.2.23 Site survey in advance		
	2.2.24 Operation on loose ground		
	2.2.25 Don't approach high voltage cable		
	2.2.26 Ensuring favorable view	2-28	
	2.2.27 Ventilation of working environment	2-29	06
	2.2.28 Prevention of asbestos dust	2-29)
	2.2.29 Cab emergency exit	2-30	
2.3	2.2.27 Ventilation of working environment 2.2.28 Prevention of asbestos dust 2.2.29 Cab emergency exit Safe machine operation 2.3.1 Start	2-30	
0.	2.3.1 Start	2-30	
	2.3.1.1 Boarding the machine safely	2-30	
	2.3.1.2 Adjusting the seat		
	2.3.1.3 Fastening safety belt		
	2.3.1.4 Inspection before engine start	2-31	
	2.3.1.5 Starting the machine safely	2-32	
	2.3.1.6 Engine start in cold weather	2-33	
	2.3.1.7 Required auxiliary equipment for start	2-33	_
	2.3.1.8 After starting the engine	2-34	00
	2.3.1.8 After starting the engine	2-34	
	2.3.2.1 Check before operation	2-34	
9.76	2.3.2.2 Precautions before operation	2-35	
	2.3.2.3 Verifying the travel direction	2-35	
	2.3.2.4 Safety rules for changing the machine direction	2-36	
	2.3.2.5 Travel safety rules	2-38	
	2.3.2.6 Driving the machine safely	2-39	
	2.3.2.7 Operation on a slope	2-41	
	2.3.2.8 Operation in snowy weather		
	2.3.2.9 Forbidden operation	2-42	
	2.3.3 Parking	2-44	00
	2.3.3.1 Choosing parking lot	2-44	1-00
	2.3.3.2 Machine shutdown	2-45	
80	2.3.3 Parking	2-45	
9 7,	2.3.4.1 Transportation	2-45	
	2.3.4.2 Loading and unloading	2-46	
	2.3.5 Battery	2-47	

	2.3.6 Towing	2-49
	2.3.7 Lifting by excavator	2-50
22	2.3.6 Towing	2-51
9-10	2.4.1 Precautions before maintenance	2-51
	2.4.2 Self-preparation	
	2.4.3 Preparation of working area	
	2.4.4 Steps of engine shutdown before maintenance	
	2.4.5 Warning decal	
	2.4.6 Proper tools	2-54
	2.4.7 Maintenance during engine running	2-55
	2.4.8 Operation under the machine	2-55
	2.4.9 Track maintenance	2-56
	2.4.10 Safety precautions for track tension adjustment	2-57
	2.4.11 Don't remove the buffer spring	2-57
4 tege	2.4.12 Be careful of hot cooling system	2-58
0	2.4.13 Safe operation of high pressure hose	2-58
	2.4.14 Be careful of high pressure liquid	
	2.4.15 Welding operation	2-60
	2.4.16 Safe maintenance of HVAC group	2-60
	2.4.17 Precautions related to high voltage	2-61
	2.4.18 Accumulator	2-61
	2.4.19 Preventing the danger of fire and explosion	2-61
	2.4.20 Regular replacement of safety related parts	2-62
	2.4.21 Maintenance operation	2-62
	2.4.22 Proper waste treatment	2-63
d feder	2.4.21 Maintenance operation	defico L
d 1800	4 fear	9 1600
O -2		

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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

2.Safety

2.1 Safety decals

2.1.1 General

This machine uses the following warning and safety decals.

- This machine uses the following warning and safety decals.
- Please keep the decals in the right positions and clean to ensure their readability. Do not clean the decals with organic solvent or gasoline, for fear of peeling off of the decal paint.

d_federico 2022-09-06

- Treat other decals in the same way as warning and safety decals.
- When the decals are damaged, lost or unreadable, please replace them. As for detail of decal d federico 2022-09part number, please see this manual or the actual decals. d federico 20

2.1.2 Location

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

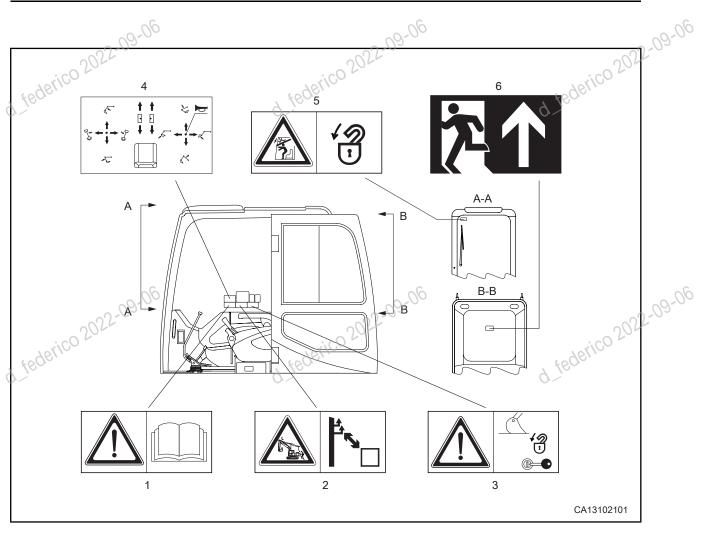


Fig.2-1

- [1] "Read manual" warning decal
- [2] High voltage warning decal
- [3] Power-off warning decal

- [5] Front windshield lockout warning decal
 [6] Emergency exit decal

d. federico 2022-09-06

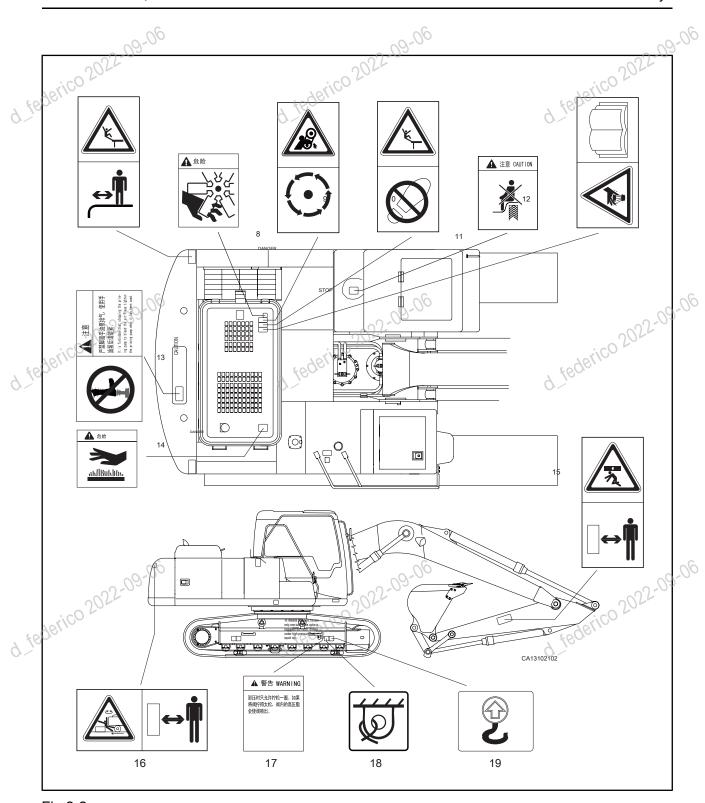


Fig.2-2

[7] Fall warning decal
[8] "Injury by fan" warning
decal
[9] Belt safety warning decal
[12] Anti-spray warning decal
[13] "No air bleeding by stepping" warning decal
[14] Hot surface warning decal
[19] Hook point decal

[10] "Stand clear of the area" [15] Work equipment caution warning decal

[11] "No sitting" warning decal [16] "No entry" warning decal

2.1.3 Description

d federico 2022-09-06

[1] "Read manual" warning decal

 Please read this manual before operation, maintenance, disassembly, assembly and transportation of the machine.

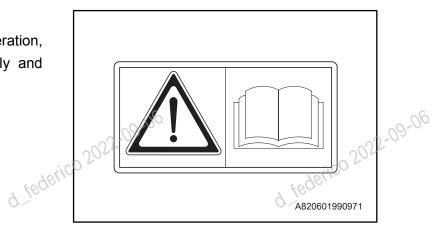


Fig.2-3

[2] High voltage warning decal

- This decal indicates if the machine is too close to the power transmission line, there will be the danger of electric shock.
- Keep the safety distance from the power transmission line.

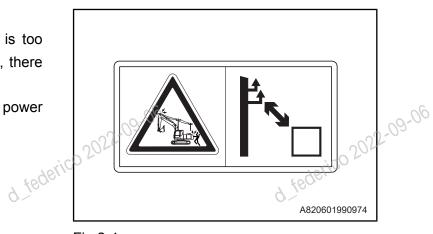


Fig.2-4

[3] Power-off warning decal

 Before leaving the machine, please lower down the work equipment to the ground, pull the safety control lever to the lock position and pull out the ignition key.

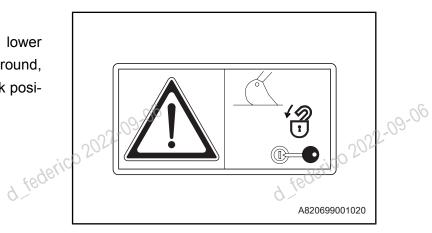


Fig.2-5

To avoid casualty during operation, please verify the running status of the machine the displayed running status. to the surrounding environment and operate the machine slowly.

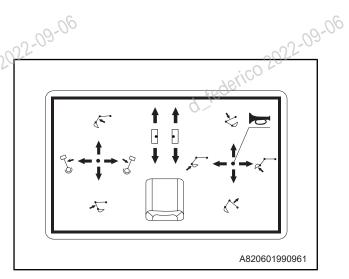


Fig.2-6

1022-09-06 [5] Front window lockout warning decal

- This decal indicates the danger of the front window falling down.
 - · After raising the front window, please lock it with the lock pin.

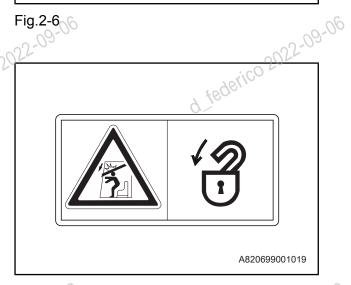


Fig.2-7

[6] Emergency exit decal

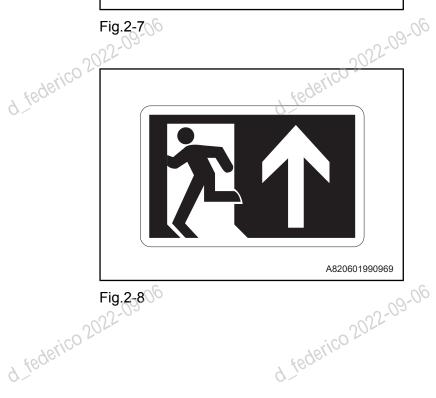
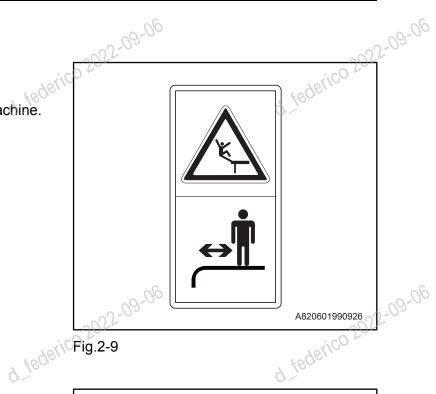


Fig.2-8 rig.2 d_federico2022-0

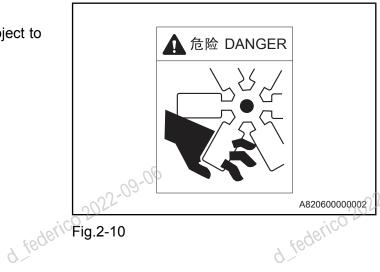
- [7] Fall warning decal

 There may be " • There may be the danger of falling.
- Don't stay close to the edge of the machine.



d federico 2022-09-06 [8] "Injury by fan" warning decal

· Please keep away from the rotary object to avoid injury.



d federico 2022-09-06 [9] Belt safety warning decal

d federico 2022-09-06

- This decal indicates the danger of the rotary belt.
- Please stop the belt before maintenance.

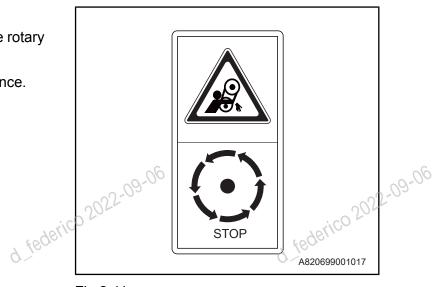


Fig.2-11

2-10

• Stand clear of the area warning decal danger of falling.

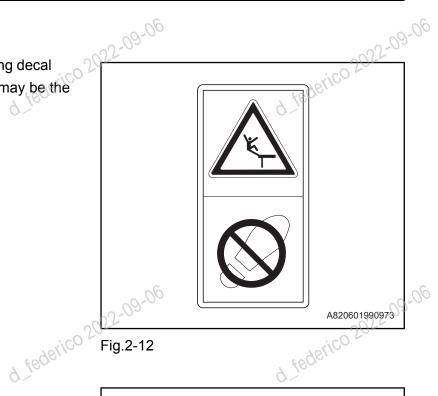


Fig.2-12

d federico 2022-09-06

[11] No-sitting warning decal

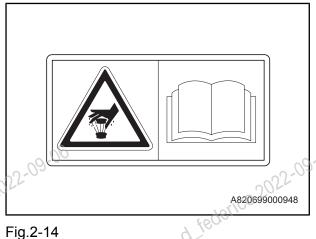


Fig.2-13

[12] Anti-spray warning decal

d_federico 2022-09-06

• Please release the tank pressure in accordance with the operation instruction before opening the tank cover like fuel tank cover, and open the cover slowly to avoid spraying. d. federico 2022-09-06



d federico 29 Fig.2-14 [13] "No air bleeding by stepping" warning decal

Never step on the priming pump to bleed the air.



Fig.2-15

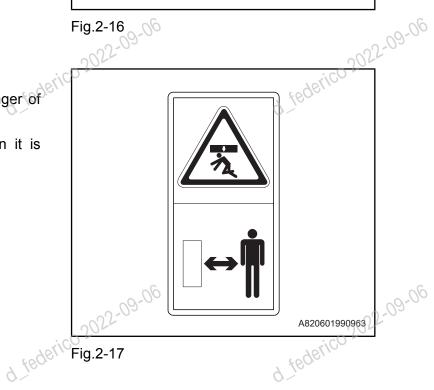
[14] Hot surface warning decal

 Please don't touch the hot surface to avoid scald.



[15] Work equipment caution decal

- The decal indicates there is the danger of being collided by the work equipment.
- Keep away from the machine when it is operating.



- The decal indicates there is the danger of being collided by the machine, please enter the turning at
 - · Keep away from the machine when it is operating.



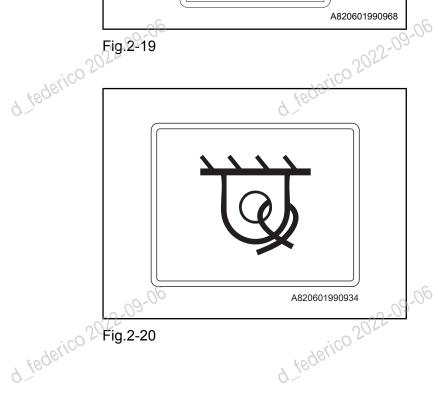
Fig.2-18

022-09-06 [17] Track tension adjustment warning decal

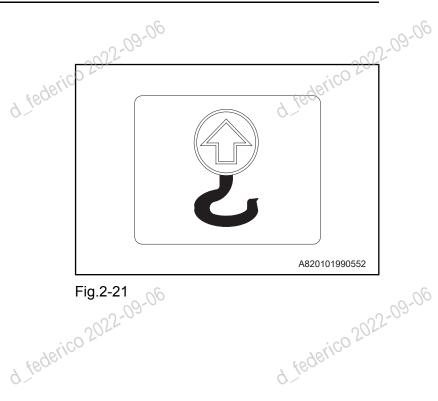
• Don't loosen the track more than 1 turn, or there will be the danger of injury caused by the flying regulating valve under high pressure.



rico 2022-09-06 [18] Shipping tie-down decal



[19] Hook point decal d federic



2.2 Safety information

2.2.1 Safety rules

- Only trained workers can be assigned to operate and maintain the machine.
- Please abide by all safety rules, precautions and instructions when operating and maintaining the machine.
- Alcohol and medicine will severely reduce/ gering himself/herself and other people on the site.

 When working with another one
- When working with another operator or a commander, please keep all informed of all adopted hand signals.

2.2.2 Handling of abnormalities

When any abnormalities (noise, vibration, odor, incorrect instrument display, smoke, oil process of operation and maintenance, please report to the supervisor and take necessary measures. Don't operate the mach before removing all for essary measures. Don't operate the machine



2.2.3 Personal protective equipment

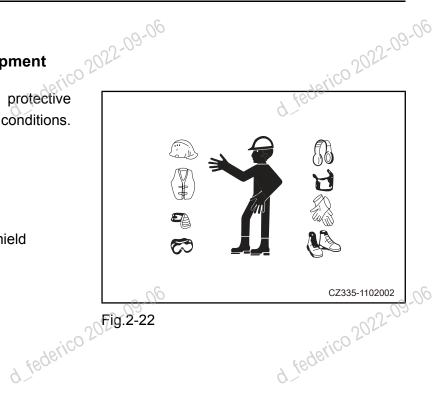
Wear tights or work clothes and protective equipment required by working conditions. You may need:

- Helmet
- Safety shoes
- Safety glasses, goggles or face shield
- Protective gloves
- Earplug
- Reflective protective clothing
- Anti-dust mask

Wear necessary safety protection equipment and the equipment required by the employer, the public service management department, and the government, as well as laws and regulations. Don't take chances to avoid unnecessary danger.

CAUTION

- Don't wear accessories and loose clothes. There will be the danger of hooking the control lever or other protruding components.
- If the hair is too long and exposed out of the helmet, there will be the danger of intertwining in the machine.
- Wear the helmet and safety shoes all the time. If necessary, please wear safety glasses, mask, gloves, earplug and safety belt when operating or maintain the machine.
- d. federico 2022-09-06 Please check that all protective equipment function normally before use.



02022-09-06





To prevent injury or fire, please observe the following precautions:

- Please read the instruction attached on the fire extinguisher carefully to ensure proper use of the fire extinguisher.
- · Read and understand the instruction attached to fire extinguisher. Use fire extinguisher properly.
- Please check and maintain the fire extinguisher regularly to ensure it's available at any time.
- Please check the first-aid kit regularly and add medicine if necessary.
- · Establish emergency plan to deal with fire and accident.

<u>federico</u> 2022-09-06 d_federico 2022-09-06

Fig.2-23

2.2.5 Safety equipment

To protect you and the people around, your machine can be equipped with the following safety equipment. Please ensure each one is fixed in the right position and in the working condition.

- Falling object protective structures
- Protective guard
- Guard board
- Lamps
- Safety decals
- Horn
- Travel warning
- Mirror
- Fire extinguisher
- First-aid kit
- Wiper blade

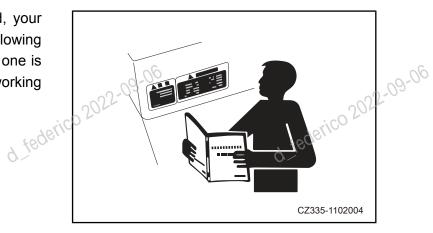


Fig.2-24



d_federico 2022-09-06

Please ensure all equipment above is available. You are forbidden to take down or disconnect any safety equipment

CAUTION

- Ensure all protective covers and caps are in their proper positions. If covers and caps are damaged, repair them at once.
- Understand how to use safety equipment and use it correctly.
- 02022-09-06 Don't take down the cab protective guard without authorization (except machine maintenance).

2.2.6 Keeping the machine clean

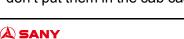
- Clean the wiper, mirror and lamps. Clean away grass, snow, ice or mud in operation area, steps and handles in time. Remove the mud on shoes before entering the machine.
- Checking and maintaining the machine with mud or greasy dirt will cause the danger of slipping, falling or dirt entering eyes. Keep the machine clean all the time.
 - If water enters the electrical system, don't hurry to start the power or the engine, which could cause machine failure, computer mainboard damage or other malfunctions. Don't wash the electrical system (sensor, connector etc.) by water or vapor.

2.2.7 Keeping the cab clean

- Please remove the mud and grease on be severe accident caused by slip when treading the pedal
 - · Store scattered objects in the toolbox, and don't put them in the cab casually.



Fig.2-25





- Priorie when operating or Griving the machine.

 Don't bring dangerous objects such as inflammable and explosive materials in the cab.

2.2.8 Locking of safety lock control lever

- · Before standing up from the seat (for purposes such as opening or closing the front window and skylight, removing or installing bottom window, on adjusting the seat), please lower down the work equipment fully to the ground, firmly turn the safety lock control lever to the lock position and shut down the engine. If the control lever or the pedal isn't locked, the machine may move suddenly and lead to serious personal injury or machine damage.
- Before leaving the machine, make sure to lower down the work equipment fully to the ground, firmly turn the safety lock control lever to the lock position and shut down the engine. Lock all equipment with the key, take off the key and put it in the specified place.

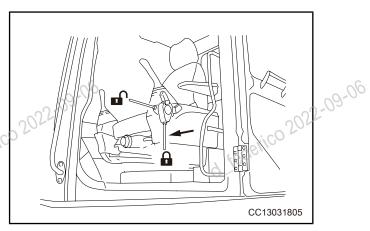


Fig.2-26

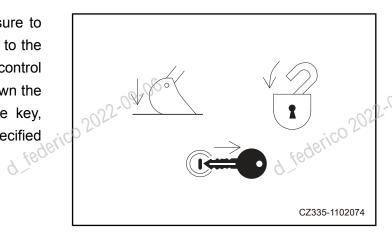


Fig.2-27





2.2.9 Armrest and ladder

A CAUTION

- Face the machine all the time when entering and leaving the machine.
- Don't jump up to or down from the machine, don't climb it when it travels, and don't jump up to it to try to stop it.
- Before entering and leaving the cab, be sure to check that it is in the front position.

To prevent personal injury due to slipping or falling down from the machine, please comply with the following:

- Check the armrest and ladder (including the track shoe) before entering and leaving the machine. If there is oil, grease or mud on the armrest or ladder (including the track shoe), please clean it away at once and keep all these parts clean; if these parts are damaged, please repair them and tighten the loose bolts.
- Please use the arrow marked armrests and ladder shown on the right when entering and leaving the machine.
- To ensure safety, please face the machine and keep three body parts (two feet and one hand or two hands and one foot) touch the armrests and ladder (including the track shoe) to support the body.
 - Don't grasp or hold the control lever or lock
 - Don't enter or leave the machine with tool in the hand.

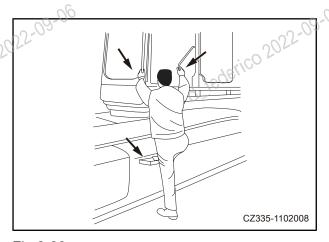


Fig.2-28

150 5025-09-06



d_federico 2022-09-06

2.2.10 Precautions for working at heights

federico 2022-09-06 When working at heights, please use stepladder or other brackets to ensure safe operation.

2.2.11 Keeping clear of the accessory

Don't allow anyone to sit on the work equipment or other accessories because there will federico 2022-09-06 be the danger of falling and severe injury.

2.2.12 Don't get stuck in the articulation section

The interspace around the work equipment will change with the movement of the link. Getting stuck in it will lead to severe injury. Don't allow anyone to approach the rotating or stretching part.

2.2.13 Preventing scald

2.2.13.1 Hot coolant

- To prevent scald caused by squirt of hot coolant or vapor, please wait for full cooling of the coolant before checking or draining the hot coolant.
- Don't open the radiator cap before the engine cools down. Even the coolant is cold, be sure to slowly loosen the radiator cap before removing it to release the internal pressure of the radiator and prevent severe scald. d_federico2022-09-06



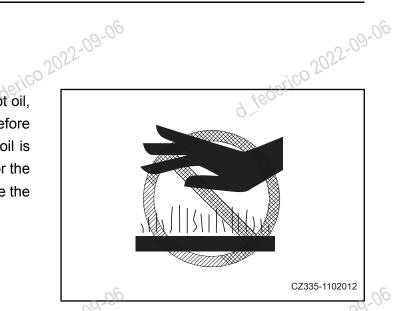
d federico 2022-09-06 Fig.2-29



2.2.13.2 Hot oil

d federico 2022-09-06

To prevent scald caused by squirt of hot oil, please wait for full cooling of coolant before checking or draining the oil. Even the oil is cold, be sure to slowly loosen the cap or the screw plug before removing it to release the internal pressure.



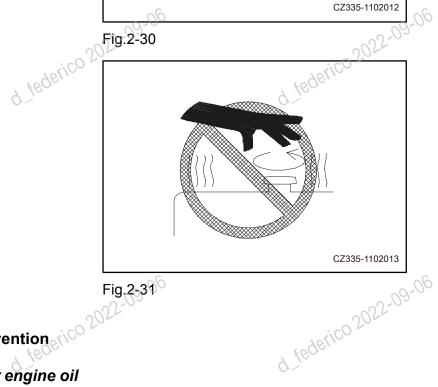


Fig.2-31

2.2.14 Fire and explosion prevention

2.2.14.1 Fire caused by fuel or engine oil

- Fuel and engine oil shall be stored in the specified place. Don't approach it without permission.
- · Forbid smoking or open fire near fuel and engine oil.
- Check if the pipe clamp is lost or slack, the hose is twisty or knotting, hose and pipeline rub each other, oil cooler is damaged, the flange bolt of the oil cooler is slack, to prevent fuel/oil leakage; and tighten, repair or replace any lost, slack or damaged clamp, pipeline, hose, oil cooler and its flange bolt.

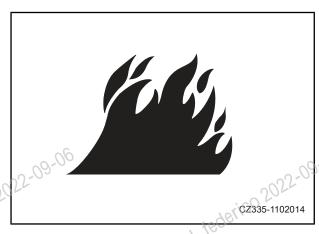


Fig.2-32

- federico 2022-09-06 Add or store fuel and engine oil in a wellventilated place.
- Shut down the engine before refilling.
- Don't leave the machine when refilling it with fuel and engine oil.
- Don't spill the fuel to the overheated surface or electrical system component.
- · Wipe off spilled fuel or engine oil in time after refilling with fuel or engine oil.
- Place the cleaning cloth with oil or other inflammable materials into the safety container to ensure the safety of the work site.
- Firmly tighten the fuel and engine oil tank covers.
- If required, please rinse the components with nonflammable oil. Do not rinse components with diesel or gasoline as it is inflammable.
- Before conducting grinding or welding operation on the chassis, make sure to move all inflammable materials to a safe place.
- Don't weld the pipeline containing inflammable liquid or cut it through the cutting torch.



Fig.2-33

2.2.14.2 Fire caused by inflammable materials

d federico 2022-09-06 Eliminate dry leaves, wood chips, paper scraps, dust and other inflammable objects stacking or sticking around the engine, exhaust manifold, silencer and battery or inside the hood.

2.2.14.3 Fire caused by electrical wire

The short circuit of the electrical system will lead to fire.

- Keep the connector of the electrical wire clean and fix it firmly.
- After operation for 8~10 h, check if the cable or electrical wire is slack, twisty or knotting, hard or broken; and check if the connector end cap is lost or damaged at the same time.
- When the cable or wire is slack, twisty or knotting, firmly tighten the slack connector or wire clamp straighten out the routing. d federico 202 clamp, straighten out the routing, and repair or replace damaged electrical wire.

2.2.14.4 Fire caused by hydraulic circuit

• Check if all clamps, caps and cushions of hoses and pipeline are fixed in the right places.

 If any is loose, it will vibrate and rub with other components, leading to hose damage, high presd federico sure oil squirt, which will cause fire hazard or severe injury.

2.2.14.5 Fire caused by lighting equipment

- Make sure to use explosion proof lighting equipment when checking fuel, engine oil, battery acid, window cleaning solution or coolant. Otherwise, there will be the danger of explosion, leading to severe injury.
- When using the electric power of the machine as the lighting, please follow the regulations in this manual.

2.2.14.6 Fire caused by heat shield

- Lost or damaged heat shield will cause fire.
- If any abnormalities are discovered, please repair or install a new heat shield before operation.

2.2.15 Actions in case of a fire

If there is a fire, please leave the machine quickly as per the following requirements.

- Turn the starter switch to OFF position to shut down the engine.
- Leave the machine by the armrest and ladder.

1. Please use ethanol-based cleaning solution instead of methanol-based cleaning as the late instead of methanol-based cleaning solution as the later one can hurt eyes.

2.2.17 Preventing flying components

The grease in the track tensioning regulating device is under high pressure, therefore if the following precautions aren't observed, accidents of severe injury, blindness or death may occur:

- · Don't remove grease nozzle or valve components because they may fly off. Please keep the body and face away from the valve.
 - Pressure exists inside the travel drive assembly.



Fig.2-34



 Gear oil is hot, so make sure to wait for cooling of gear oil before gradually loosening the air exhaust plug to release pressure. Because parts may fly off, please keep the body and face away from the air exhaust plug to avoid injury.

d_federico 2022-09-06 rico 2022-09-06

2.2.18 Prevent falling, flying and invading objects

On the dangerous work site where falling, flying and invading objects would hit or enter the cab, install necessary protection shield to protect the operator according to the operation conditions.

- When conducting removal or breaking operation, install front protection shield and paste transparent cellophane on the front window.
- When operating in a mine or quarry with the risk of rock falling, install FOPS (Falling Object Protective Structures) and front protection shield, and paste transparent cellophane on the front window; and operator shall wear helmet and protective glasses.
- When conducting the above operation, please close the front window. In addition ensure that other workers keep proper safety distance from the falling hazard zone.
- The conditions described above are typical working conditions, and there may be other protective shields required to install based on the site conditions. Please contact the agents authorized by Sany Heavy Machinery Co., Ltd. in advance.

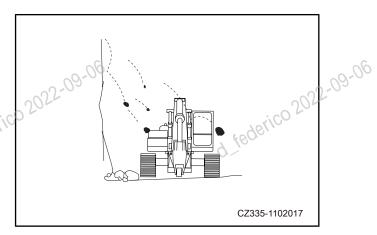


Fig.2-35

iico 2022-09-06

2.2.19 Accessory installation

tederico 2022-09-06 Issues of safety or legal restraint are existing for installation of options or accessories. Therefore, please contact the agents authorized by Sany Heavy Machinery Co., Ltd.



- For any injury, accidents or product malfunction caused by use of unapproved accessory or part, Sany Heavy Machinery Co., Ltd takes no responsibility.
- When installing and using purchased accessory, please read the instruction manual of related accessory and the general instruction of related accessory in this manual.

2.2.20 Accessory combination

Different types or combinations of work equipment may lead to the danger of colliding with the cab or other parts of the machine. Before using unfamiliar work equipment, please check if there is the danger of collision and be careful to operate.

2.2.21 Cab window glass

- If the cab window glass near the side of the work equipment is damaged or broken, there will be the danger of the work equipment touching the operator's body. In that case, please stop operation at once and change glass.
 - If the skylight is damaged and fails, please replace it with new glass.

2.2.22 Unauthorized retrofit

Machine retrofit, unauthorized by Sany Heavy Machinery Co., Ltd, may lead to safety issues and personal injury. Retrofit will have severe influence on the strength and view of the machine. Before any retrofit, please contact the agents authorized by Sany Heavy Machinery Co., Ltd. For any accident, malfunction or damage caused by unauthorized retrofit, Sany Heavy Machinery Co., Ltd will Federico 2022-09-06 tederico 2022-09-06 take no responsibility.

2.2.23 Site survey in advance

- During operation near such inflammable materials as grass roof, dry leaves or dry grass, there will be the danger of fire, so please be careful during operation.
- Check the terrain and ground conditions of the work site and determine the safest operation methods. Don't operate the machine in dangerous zones of landslide or rockfall.
- During operation in dangerous areas such as near-ditch area or road shoulder, please reinforce the ground based on the actual need and keep the safety distance from th machine to the near-ditch area or road

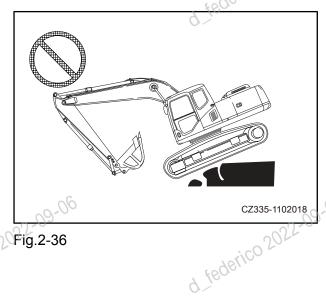


Fig.2-36



- gas pipe, cable or high voltage elements buried under " tact related public administration departments and mark the positions before operation and pay attention not to breaking or damaging any pipeline.
- Take necessary measures to prevent anyone without access permission from entering the operation area. During operation on the road, please assign a signalman to install a retaining plate to ensure smooth traffic and pedestrian safety.
- During operation on the frozen ground, please be cautious, because the increasing environment temperature will make the foundation soft, wet and slippery.
- When the machine travels or is operated in shallow water or soft ground, please check the type and conditions of the bedrock as federico 2022-09-06 well as the depth and flow rate of water.

2.2.24 Operation on loose ground

- Avoid the traveling and operation of the machine near the cliff, on the road shoulder and deep ditch. In these areas with soft ground, there is the danger of the machine falling or rollover because of the weight of the machine and vibration. Please notice that the ground will be much softer after heavy rain, blasting or earthquake.
- aniger of ground

 machine and vibration. Before operation,

 please take measures to ensure During operation on the dam or near the please take measures to ensure ground

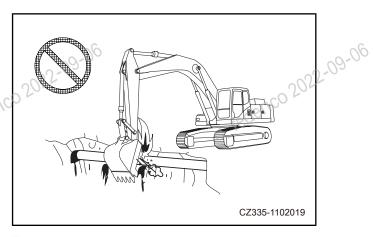


Fig.2-37



federico 2022-09-06 safety and prevent machine rollover or falling.

d feder 2.2.25 Don't approach high voltage cable

Don't operate the machine or control it to travel near the cable, as there may be the danger of electric shock, which will lead to equipment damage or casualty. Please operate the machine as per the following steps in the work site near the cable:

- Don't operate the machine or control it to travel near the cable, as there may be the danger of electric shock, which will lead to equipment damage or casualty. Please operate the machine as per the following steps in the work site near the cable:
 - There is high possibility of electric shock if the machine stays close to the cable, which leads to severe burn and even death. Please keep the safety distance from the machine to the cable (see the right table). Before operation, please consult with the local electric power company about meas-
- If the machine stays close to the cable, a signalman shall be assigned to come signalman shall be assigned to command
 - Don't allow anyone to approach the machine during operation near the high voltage cable.

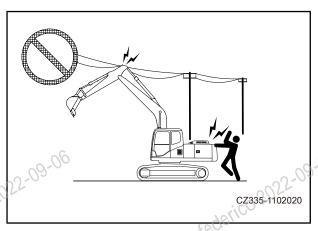


Fig.2-38

d. federico 2022-09-06

d. federico 2022-09-06

d. federico 2022-09-06

- When the machine stays close to the cable or touches the cable, the operator shall not leave the cab before verifying the cable is cut off to avoid electric shock. In addition, don't allow anyone to approach the machine.
- To prevent accidents, please wear rubber shoes and gloves before operation. Cover a layer of rubber pad on the seat and pay attention to ensuring that exposed parts of the body will not touch the lower part of the machine.

Cable Voltage	Min. Safe Distance	
100V-200V	2 m (7 ft)	
6,600V	2 m (7 ft)	
22,000V	3 m (10 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)	
Table 2–1	12 m (36 ft)	29-

Table 2-1 d federico

2.2.26 Ensuring favorable view

This machine is equipped with a rearview mirror to improve the view; but even with it, also there are places unseen from the seat. Therefore, be cautious during operation.

Before operating the machine in a place with bad view, make sure to verify the conditions of federico 2022-09-06 the work site or the obstacles around the machine; otherwise machine damage or personal injury may occur. Please strictly observe the following precautions when operating the machine in a place with bad view:

- Before operation every day, please check the rearview mirror. Clean it and adjust the view range to ensure favorable view.
- During operation in dim places, turn on the work light and the front lamp of the machine and install auxiliary lighting in the working region if necessary.
- Stop operation if favorable view can't be
- Install signs on the road shoulder or soft ground. When the view is bad, assign a final malman if an nalman if necessary. Operator shall pay



great attention to the signs and follow signalman's command.

 Ensure all workers understand all signals and gestures before operation.

2.2.27 Ventilation of working environment

- Exhaust gases from the engine can be deadly, therefore if it is necessary to start the engine, or deal with fuel, cleaning oil or paint in a closed zone, the door and window shall be open to ensure sufficient ventilation for preventing gas poisoning.
- Do not operate the machine in the environment of toxic gas or underground; if necessary, please wear gas mask and ensure ventilation.

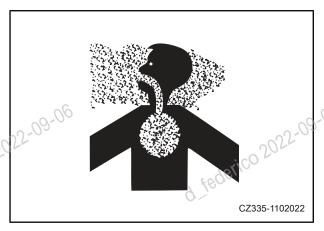


Fig.2-39

2.2.28 Prevention of asbestos dust

Inhaling asbestos dust from the air would lead to lung cancer. There is the danger of inhaling asbestos when workers are engaged in removal operation or handling industrial waste.

Please observe the following rules:

- During cleaning, reduce dust by spraying water, and don't clean by compressed air.
 - If there is asbestos dust in the air, please operate the machine in the windward position. Every worker shall wear dust mask.
 - Don't allow anyone to approach the machine during operation.
- Please observe the local regulations, rules and environment standards.

 A federico 2022-09-06







• This machine uses no asbestos, but counterfeit parts may contain asbestos inhaling asbestos death. Therefore, please use genuine parts of Sany Heavy Machinery Co., Ltd.

2.2.29 Cab emergency exit

- If the cab door can't be opened for some reason, use the safety hammer to break the window, creating an emergency exit.
- For escape, remove all glass fragments in the window frame firstly and be careful not to be hurt by glass. Also, be careful not to slip because of glass fragments.



Fig.2-40

2.3.1.1 Boarding the machine safely When you come into and le 2.3 Safe machine operation

- Face the machine and keep three body parts (two feet and one hand or two hands and one foot) touch the machine.
- Don't jump up to and down from the machine, and don't climb it when it runs.
- Don't take any control levers as the armrest.
- Mud, greasy dirt and water on all pedals, armrests and shoes shall be cleaned away at any time.
- Before entering and leaving the cab, it must be in the front position.

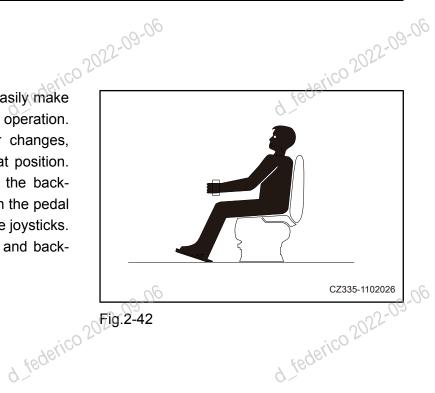


Fig.2-41



2.3.1.2 Adjusting the seat

Uncomfortable seat position may easily make the operator tired, leading to wrong operation. Every time the machine operator changes, the operator shall readjust the seat position. When the operator backs against the backrest, he/she shall be able to step on the pedal to the floor and correctly operate the joysticks. Otherwise, move the seat forward and backward to readjust it.



3rico 2022-09-06 2.3.1.3 Fastening safety belt

When rollover accident occurs, operator may be hurt or thrown out of the cab, or likely to be squashed by the machine, leading to severe casualty accident. Before operation, please check the safety belt, buckle and fixture carefully. The safety belt or its components, if damaged or worn, shall be replaced before operation. Please sit on the seat and fasten the safety belt during the running process of the machine to avoid accident.

It's best to replace the safety belt once three years regardless of its service condition.

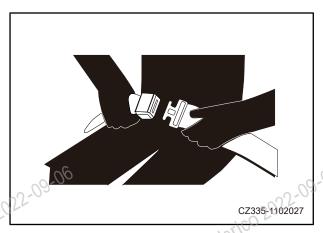


Fig.2-43

2.3.1.4 Inspection before engine start

Before starting the daily work, please check the followings before starting the engine:

- Wipe off dust on the window glass surface to ensure favorable view.
- Wipe off dust on the lens surfaces of the front lamp and work light and check if the work light works well.
- Check the level of engine coolant, fuel, oil and hydraulic fluid.
- · Check if the air cleaner is blocked.
- Check if the electrical wire is damaged.

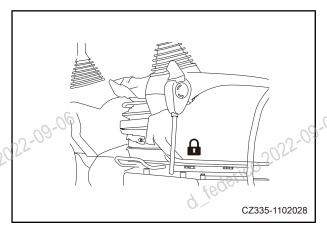


Fig.2-44

tederico 2022-09-06 Adjust the seat to the position which is easy for operation and check if the seat belt and fixture are damaged or worn.

Check if the instruments work well, check the angle of the work light and check if all control levers are in the neutral position.

- Check if the safety lock control lever is in the lock position.
- Adjust the rearview mirror so as to clearly see the rear of the machine from the cab seat.

For the correct start steps, see the instruction about starting machine in the Operation.

- Before starting the machine, ensure no people stays on, below and around the machine and press the horn button to give the start warning.
- Sit on the driver's seat and adjust it until you feel comfortable to operate all control devices.
- · Be familiar with all warning devices, instruments and operational control devices.
- Set all control devices to the neutral /parking position.
- Don't allow anyone to stay on the machine except for the operator.
- Please strictly observe the instruction of the Section Operation in this manual to start the engine. Don't follow the way that will cause the motor short circuit to start the engine.

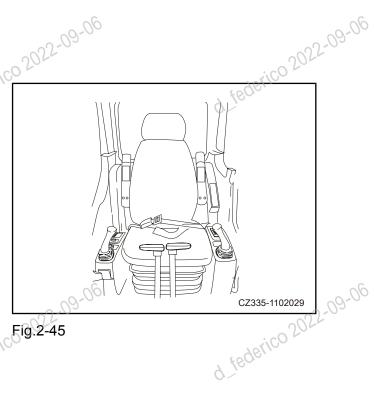


Fig.2-45





WARNING

- When it is necessary to start the engine or operate the machine in a closed environment, please ensure sufficient ventilation. Inhaling too much tail gas could lead to death.
- If you cannot shut down the machine, please do not start it.

2.3.1.6 Engine start in cold weather

Warm up the engine fully. (Turn the ignition switch to "ON" position. Then the electrical system
will heat the coolant automatically. Please wait for more than 8 s.) If the engine isn't fully warmed
up, operation of control levers will be responded slowly by the machine, leading to accidents.

02022-09-06

• Check if the battery acid is frozen or leaks before starting. If the battery acid is frozen, don't charge the battery or start the engine by different electric power. In that case, please melt the battery acid firstly, otherwise the battery may be on fire.

2.3.1.7 Required auxiliary equipment for start

Please follow the instruction in the operation manual when starting the engine by connecting auxiliary cable. Incorrect operation will lead to battery explosion or the machine out of control, and cause casualties. It is forbidden to start the engine by auxiliary cable without permission. Please contact the agents authorized by Sany Heavy Machinery Co., Ltd. if necessary.

 2 persons are needed to cooperate to start the engine by auxiliary cable (one sits on the driver's seat and the other operates the battery).

Please wear goggles and rubber gloves before starting the engine by auxiliary cable.

- When connecting the normal machine with the machine with malfunction by auxiliary cable, the battery voltage of the former shall be the same as that of latter. Meanwhile, please pay attention not to making two machines contact each other.
- Turn the ignition switches of the normal machine and the machine with malfunction to "OFF" position when connecting the auxiliary cable. Otherwise when the power is on, the machines may move and pose a risk.
- Please make sure to connect the positive pole (+) at first, when connecting the auxiliary cable.
 Please disconnect the grounding or the negative (-) cable (grounding side) when removing the auxiliary cable.
- When removing the auxiliary cable, be careful not to make the auxiliary cable clamps contact each other or the cable clamps contact the machine. As diethyl ether cold starting fluid is extremely inflammable and explosive, please read the instructions on the container before use.



Don't use diethyl ether when the engine is equipped with glow plug preheater or other types of preheater. d federico 2 d federico 21

2.3.1.8 After starting the engine

After the engine is started, idle it for 3 ~ 5 min, and observe the system parameters displayed in the instruments to ensure the instruments function well and each reading is in normal operational range.

2.3.2 Operation

2.3.2.1 Check before operation

- federico 2022-09-06 Move the machine to a wide zone without obstacle, slowly operate it and allow no one to approach during the check.
- Please fasten the seat belt.
- Check if the instruments and equipment are working properly and check if the bucket, arm, boom, travel system, swing system and steering system function well.
- Check if the sound, vibration, heating, odor or instruments of the machine are normal, and check if there is leakage of engine oil or fuel.
- position; operate the control lever of every device to check that each device function. Test the engine speed control device with device to check that each device functions equipment.
- If any abnormalities are discovered, don't continue to operate the machine but repair it at once.

CAUTION

machine at once. Before further operation, please resolve the malfunction at once and report to the superior. Observe and carefully listen to the mad_federico 2022-09-06



2.3.2.2 Precautions before operation

To prevent severe personal injury or death, please pay attention to the followings before operation:

- The turning circle of a 12 m radius is the working area (hazard zone) of the machine. Please press the horn button to warn the workers in this area before operation.
- No one shall be on, near the machine or in the turning circle.
- To ensure the view in the travel direction, please turn the cab if necessary.
- Please assign a signalman in the place with bad view.

2.3.2.3 Verifying the travel direction

- Verify the position of the lower structure relative to the operator before driving the machine.
- Pushing the joystick forward/stepping on the pedal should move the machine forward, when the guide wheel is under the front of the cab.
- Pushing the joystick forward/stepping on the pedal should move the machine backward, when the travel motor is under the front of the cab.
 - There is a travel direction sign inside the lower structure. When the operator pushes the joystick forward/steps on the pedal, the arrow on the sign points to the actual travel direction of the machine.

Note: In this manual, front, rear, left and right refer to the direction seen from the cab when the cab faces the front while the driving wheel is in the rear of the machine.

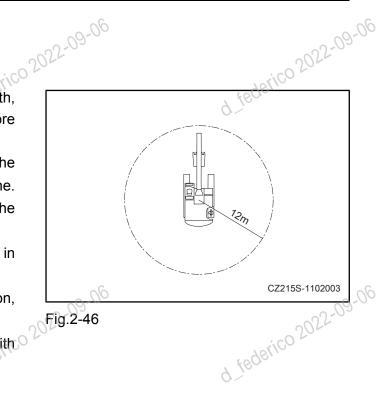


Fig.2-46

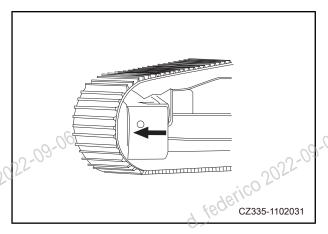


Fig.2-47

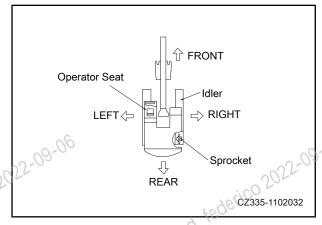


Fig.2-48

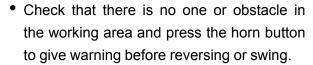


• Wrong operation of travel control lever/
pedal may lead to severe accident



2.3.2.4 Safety rules for changing the machine direction

- Operate the machine only when you are seated.
- Don't allow anyone on the machine except for the operator.
- Check if the travel warning device functions well.
- The door and window of the cab shall be locked in the opening/closing position. At the work site where there is the danger of falling or flying objects entering the cab, please check if the door and window are closed tightly.



 Be cautious to check if anyone enters the working area of the machine. Pay greater attention not to contacting other machine or person when the machine makes a turn or swings.

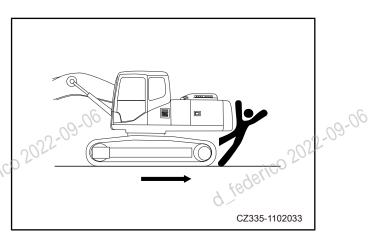


Fig.2-49

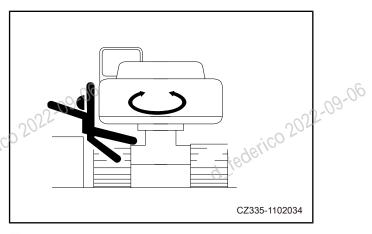
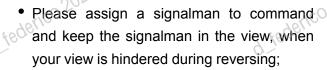


Fig.2-50



d. federico 2022-09-06

 Adjust the machine before traveling to place
 the driving wheel in back of the the driving wheel in back of the driver's seat. When the driving wheel is in the front of the cab, the machine will move in the opposite direction of the operation of the joystick (i.e. forward and backward operation for backward and forward travel, and rightward and leftward operation for left and right turn). Please pay greater attention in case of that.



- When a signalman is required under specific working conditions, please adopt hand signals accordance with local regulations;
- Only when both the signalman and the operator know well the signals can the machine be moved;
- Understand the meaning of all flags, signals and marks in work and confirm who is in charge of signaling;
- Keep the window, rearview mirror and work light clean and in good condition;
 - Dust, heavy rain, fog and etc. will reduce visibility. Please slow down and use proper lighting when the visibility reduces.

WARNING

• If someone is near the machine during ·0 2022-09-06 reversing or swing of upper structure, he/she may be knocked down or squashed by the machine, leading to severe accident.

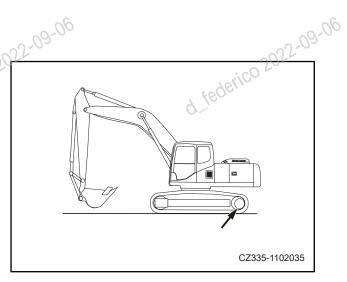


Fig.2-51

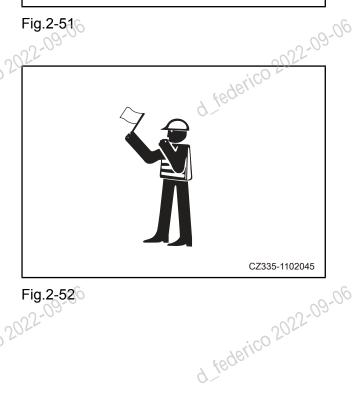


Fig.2-52



2.3.2.5 Travel safety rules

- To prevent engine stall because of overload and work equipment damage during tion, don't exceed " load or performance parameters of the machine.
- Please keep the safety distance from people, buildings and other machines to prevent collision during traveling or operation.
- Please contact relevant departments and follow their guidance when traveling on the road.
- When the machine travels on a flat ground, make sure to retract the work equipment and keep a 20 ~ 30 cm (8 ~ 12 in) height above the ground.
- The machine shall travel at a low speed on the rough ground and not make a turn suddenly, otherwise the machine may roll over. If the work equipment hits the ground, the machine will lose balance and be damaged.
- For traveling on the rough ground or steep slope, if the machine has a function of automatic idling, turn off the automatic idling switch (cancel the function); if the switch is turned on, the engine speed will reduce and travel speed will slow down abruptly.
- Avoid traveling on the obstacle as far as possible; if it's necessary, lower down the work equipment to approach the ground and move the machine at a low speed.
- Before passing over a bridge or structure, check if the structure strength is able to
- such as in tunnel, under bridge and under electrical wire, slowly operate the most and pay great. During operation in areas with limited height electrical wire, slowly operate the machine and pay greater attention not to making the work equipment contact any other objects.

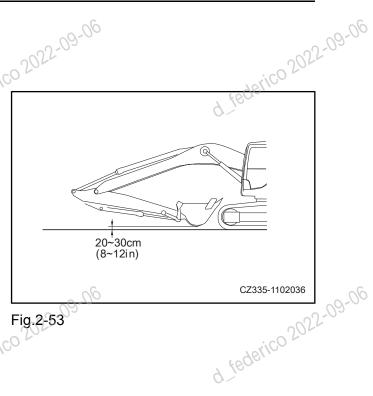


Fig.2-53

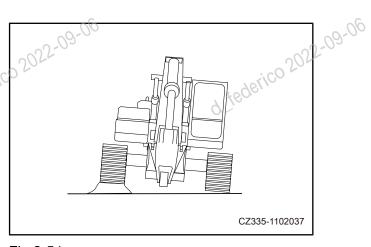


Fig.2-54



2.3.2.6 Driving the machine safely

- Verify the guide wheel is under the front of the cab and clearly know how to move the joystick or step on the pedal before driving the machine.
 - Step on the forepart of the travel pedal or push forward the travel control lever to move the machine towards the guide wheel.
 - When traveling on a slope, please keep the work equipment 20~30 cm (8~12 in) above the ground. In case of emergency, lower down the work equipment to the ground rapidly to help stop the machine.

WARNING

- Traveling on a slope may lead to slip or rollover, causing severe accident.
- For uphill traveling, adjust the cab to make it face the uphill direction; for downhill traveling, adjust the cab to make it face the downhill direction.
- Please check the hardness of the ground in front of the machine before traveling.

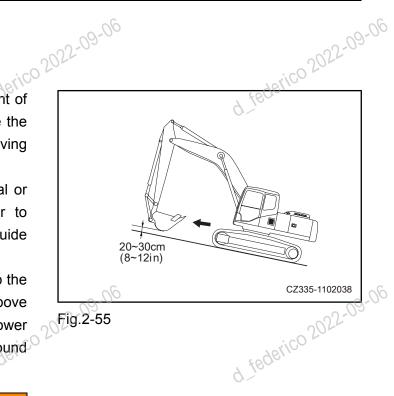


Fig.2-55

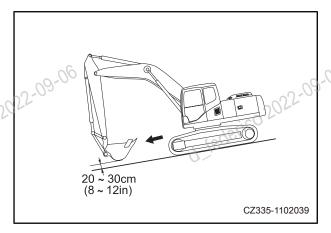


Fig.2-56





- When running up a steep slope, extend the work equipment forward for keeping balance and keep it 20~30 cm (8~12 in) above the ground, and move the machine at a low speed.
- When running down a slope, reduce the engine speed, keep the travel control lever near the neutral position and move the machine at a low speed.

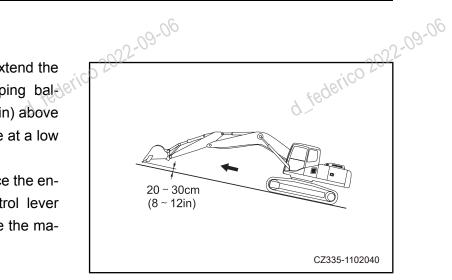


Fig.2-57

 Straightly travel uphill and downhill, because it's extremely dangerous to make a turn on the slope or cross the slope.

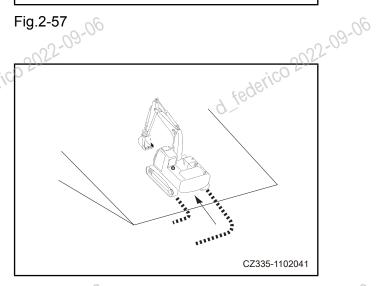
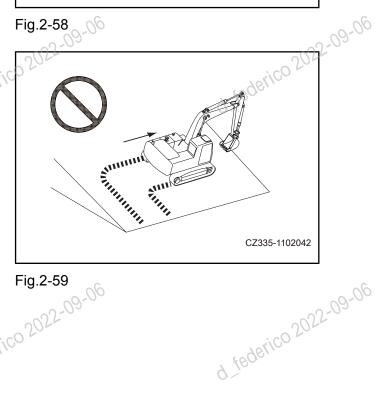


Fig.2-58

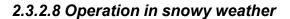
- Don't make a turn on the slope or cross the slope. Make sure to move the machine down to a flat ground, change the machine position, and then drive the machine uphill.
- Travel at a low speed on ground with grass, fallen leaves or wet steel plate. There may be the danger of slip even on a gentle slope.
- a slope, pare neutral position the engine. If the engine stops when the machine travels on a slope, please move the joystick to d. federico 2022-09-06 the neutral position immediately and restart



2.3.2.7 Operation on a slope

During operation of the superstructure or work equipment of the machine on a slope, there will be the danger of losing balance and rollover, which may lead to severe injury or equipment damage. These operations shall be done on a flat work platform and with care.

- When the bucket is fully loaded, don't swing the work equipment from the uphill side to the downhill side. This operation is dangerous and may lead to machine rollover.
- When the machine must be used on a slope, please build a work platform with soil to keep the machine horizontal as far as possible.



- During traveling or operation on a highly slippery snow-covered and frozen ground, please do not operate the control lever abruptly; pay greater attention especially during operation on a slope, because the machine may slip even on a gentle slope.
- temperature rises up, leading to machine rollover For frozen ground, it will be soft after the
 - When the machine travels over deep snow, there will be the danger of rollover and being buried in snow. Pay attention not to leaving the road shoulder and getting stuck in snow.
- When cleaning the snow, it's hard to see the road shoulder and objects near the road Therefore, be careful to operate the machine in that case. buried in snow. There will be the danger of chine in that case.

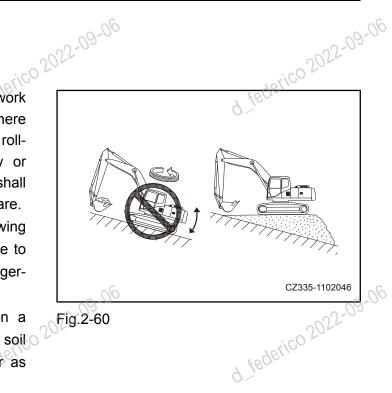


Fig.2-60



d_federico 2022-09-06

• Don't excavate the working surface under the suspending part. Otherwise. there be the danger of to collapse of the suspending part and severe accident.

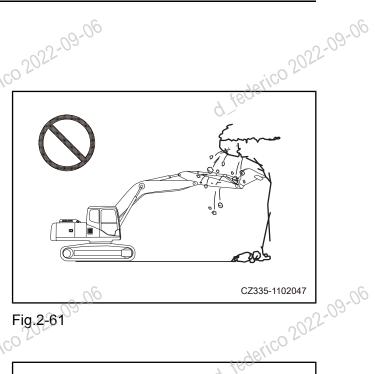


Fig.2-61

derico 2022-09-06 • Don't excavate the front area under the machine too deep. Otherwise, after the underneath part is hollowed out, the ground will collapse and lead to accident.

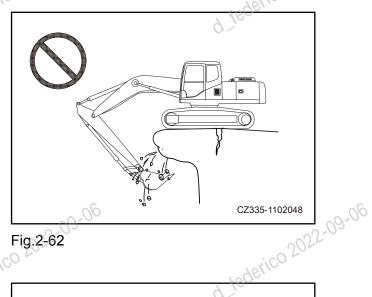
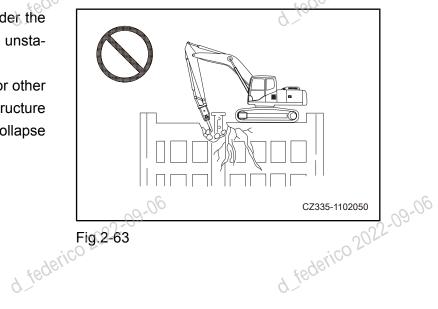


Fig.2-62

- Balerico 2022-09-06 Don't conduct removal operation under the machine, which makes the machine unstable and face the danger of rollover.
- Before operation over the buildings or other structures, please check the structure strength to prevent casualty due to collapse of structure.



 When conducting removal operation, don't remove the part immediately above. Fragment falling down and structure collapse will lead to machine damage and casualties.

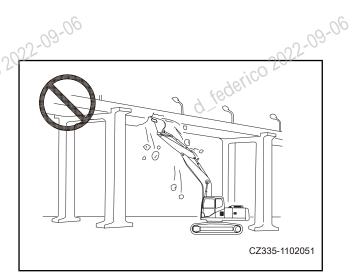


Fig.2-64

- 022-09-06 Don't break the target by the impact force of the work equipment; otherwise scattering fragment material may hurt people and damage the work equipment, and also the impact reaction may lead to machine rollover.
 - Generally speaking, the work equipment on the side of the machine is easier to turn over than the one in the front or the back.

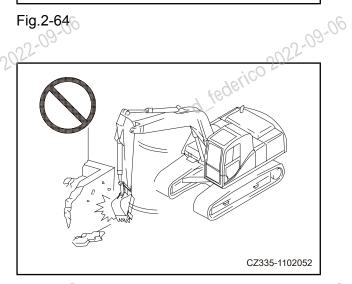


Fig.2-65

- Lifting, moving or swing of the bucket must not pass above anyone or the truck cab. If the materials in the bucket fall down or the bucket hits something, personal injury or machine damage may occur.
- · Never lift or transport people with the machine, which may lead to casualty.
- The machine with breaker or other heavy work equipment has the danger of losing balance and rollover.
- Don't suddenly lower down, swing or stop the work equipment.
- Don't suddenly extend or retract the boom cylinder; otherwise, there will be the danger of rollover because of the impact force.



Fig.2-66

2.3.3 Parking

2.3.3.1 Choosing parking lot

- Park the machine on a solid and flat ground.
- Choose a safe region without risk of falling rock and collapse etc to park the machine. For low-lying area, park the machine at the place without flood risk.

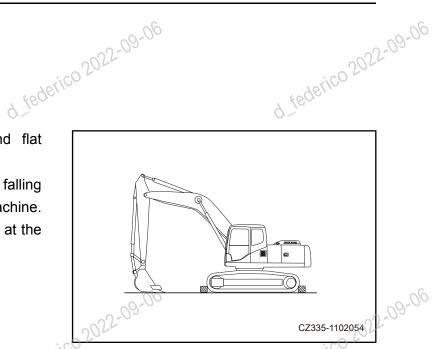
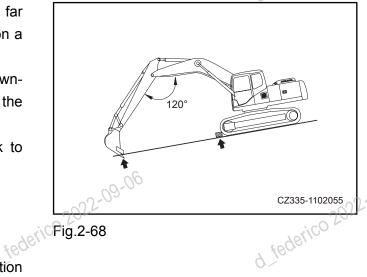


Fig.2-67

- d. federico 2022-09-06 Park the machine on a level ground as far as possible. If it's necessary to park it on a slope, following rules must be observed:
 - · Adjust the bucket to make it face the downhill side and insert the bucket tooth into the ground.
 - Place a cushion block under the track to prevent machine movement.



federico 2022-09-Don't park the machine on a construction road. If it's necessary, please comply with local rules to reminder other people or vehicles by flag in the daytime and signal lamp at night.

d_federico 2022-09-06

d_federico 2022-09-06

2.3.3.2 Machine shutdown

See the Section Operation of this Manual for detailed machine shut down steps. General shutdown procedure is as follow:

- Stop the running machine.
- · Adjust the body.
- Lower the work equipment to the ground or place it at fixed position.
- Slow down the engine and run it at a low idle speed for 5 min.
- Turn the ignition switch to [OFF] position to shut down the engine.
- Pull the safety control lever to the lock position.
 - Take out the ignition key.
 - · Close the window, skylight and cab door.
 - Lock all access doors and boxes.

Note:

- When you leave the machine, please keep three-point contact and face the machine, and don't jump down from the machine.
- When leaving the machine, be careful of the smooth track, steps and handles. d federico 20

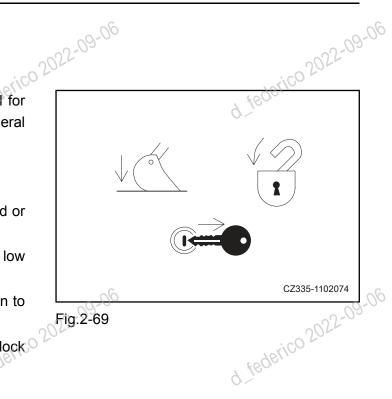


Fig.2-69

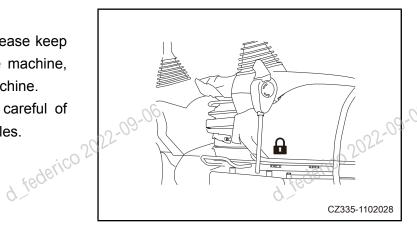


Fig.2-70

2.3.4 Transportation

2.3.4.1 Transportation

When transporting the machine, pay attention to the followings.

the transport vehicle and the machine and avoid contacting the obstacles of place and Know the overall length, width and height of place and narrow channel.



d_federico 2022-09-06

 Before passing the bridge, please check if the bridge is able to support the weight in advance; when driving on road, please follow traffic laws and traffic police's command.

2.3.4.2 Loading and unloading

During loading and unloading, wrong operation will lead to machine rollover and falling down, therefore pay attention to the followings:

- Load and unload the machine on a solid and flat ground only; keep a safe distance from the edge of the road or cliff.
- Access board with sufficient strength must be used. Ensure that the access board is wide, long and thick enough to form a safe loading and unloading slope (≤15°).
- Ensure the access board surface is clean and without grease, oil, water and scattered materials and clean dirt on the machine track. During loading and unloading in rainy or snowy weather, please be careful of the wet and slippery access board surface.
- Don't load or unload the machine by the work equipment; otherwise machine falling down or rollover may occur.
- Cancel the function of automatic idling, run the engine at a low speed and slowly drive the machine.
- Don't operate any joysticks except for the travel control lever on the access board.
- Don't correct the direction on the access board. If necessary, drive the machine away from the access board, correct the direction, and then drive the machine to the board again.
- At the connection between the access board and trailer, the machine center of gravity will change suddenly, making the

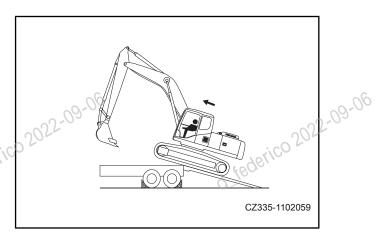
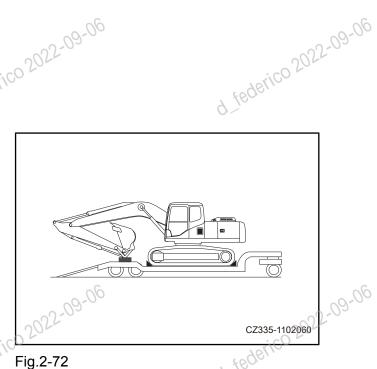


Fig.2-71

rico 2022-09-06



d_federico 2022-09-06

d_federico 2022-09-06

machine liable to lose balance. Therefore, move the machine slowly when passing this part.

• For loading and water "

- For loading and unloading on an embankment or platform, ensure the embankment or platform has sufficient width, strength and gradient.
- The trailer where the upper structure is swung will be instable, therefore, retract the work equipment and slowly swing the structure.
- After loading the machine, please lock the cab door. Otherwise the cab door may open suddenly during transport.
- Fix the machine by chain and cushion block. Fix all work equipment, lower down the bucket, boom and arm, and place them in the transport position.

2.3.5 Battery

Preventing the danger caused by battery

Battery acid comprises sulfuric acid and is able to generate flammable and explosive hydrogen. Wrong operation will lead to injury or fire. Therefore, it is important to observe the following rules:

- No smoking or open flame near the battery.
- Turn the ignition switch to "OFF" position before checking or handling the battery.
- Please wear safety glasses and rubber gloves when handling the battery.
- Battery acid is highly corrosive. If battery acid splashes on clothes and skin, flush with plenty of water at once. If it enters your eyes, there will be the danger of blindness, therefore make sure to flush with plenty of water at once and seek for medical care.



Fig.2-73





2-09-06 To avoid battery explosion, please observe the following precautions during operation:

- Don't allow tool or other metal objects to contact battery terminal; don't allow tool or other metal objects to be placed near the battery.
- For disconnecting the battery, 1 min after the engine is shut down, disconnect the negative (-) terminal firstly, and then the positive (+) terminal; For connecting, connect the positive (+) terminal firstly, and
- During charging, when the battery temperature exceeds 45°C, stop charging and the battery to t ture exceeds 45°C, stop charging and lower ature; then halve the charging current before continuing to charge the battery.
- When battery is charging, it will generate inflammable hydrogen. Therefore, before charging, dismantle the battery from the superstructure, place it in a well-ventilated place and dismantle the battery cover.
- federico 2022-09-06 If acid sprays out of the battery exhaust hole during charging, please stop charging at once.
- Never smoke or keep off any fire source during charging.
- When the battery electrical eye becomes green, it indicates completion of charging. In that case, stop charging.
- After charging, screw up the battery cover tightly.
- Install the battery to specified position d. federico 2022-09-06 d federico 2022-09-06

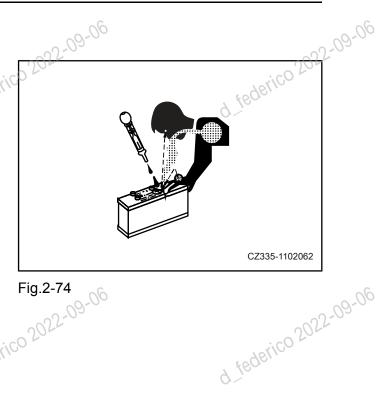


Fig.2-74



2.3.6 Towing

For towing of a damaged machine, incorrect operation method or choosing nonconforming wire rope will lead to severe accident:

- For towing of a damaged machine, incorrect operation method or choosing nonconforming wire rope will lead to severe accident:
- Wear protective gloves and helmet when using wire rope.
- · Check that the wire rope is of adequate strength that it can bear the weight of towed machine.
- Don't use wire ropes having such problems as broken strand [A], reduced diameter [B] and twisting [C]. These wire ropes may break off during towing.
- Don't stand between the towing machine and the towed machine during towing.
- Slowly operate the machine and pay attention not to loading the wire rope suddenly.

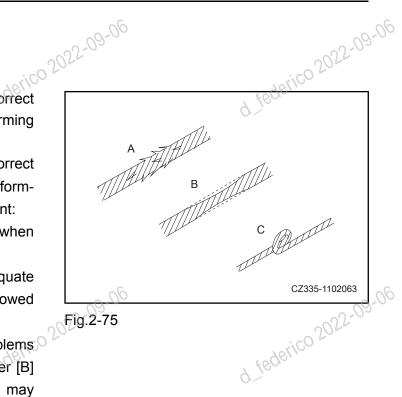


Fig.2-75

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d.federico 2022-09-06

- Allow no one to enter the working area.
 Before operation, determine all signals used in signalman.
- To prevent rollover or falling down, operate the machine on a flat ground.
- · Before lifting, please know the lifting capacity of the machine, and don't exceed the specified lifting load.
- Don't use damaged chain, wire rope, lifting eye and brace.
- Hang the lifting sling on the lifting point specified by the manufacturer. Never hang lifting eye or rope on the bucket teeth. Otherwise, the bucket teeth may fall off, leading to falling down of lifted object.
- Don't leave driver's seat during lifting.
- To prevent the lifted objects from contacting people or construction, check if the surrounding area is safe before swinging or operating the work equipment.
- Don't suddenly swing or operate the work equipment. This will lead to the swing of the lifted objects, and even machine rollover. Use a tow rope to strengthen control if necessary.
- Don't tow the load in any directions by the work equipment or by rotation. Once the lifting hook breaks and load separates from it, the work equipment will move suddenly and cause injury.

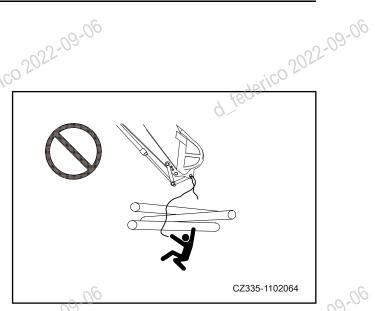


Fig.2-76

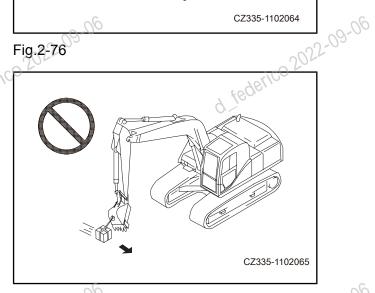
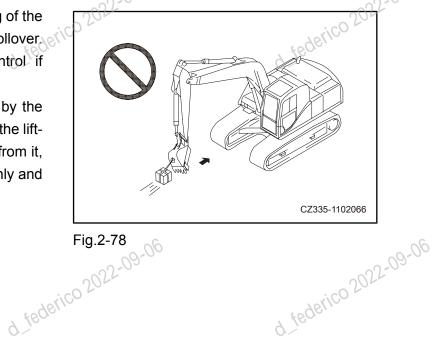


Fig.2-77



d_federico 2022-09-06

2.4.1 Precautions before maintenance To prevent accidents:

- Understand the maintenance procedure before operation.
- Keep the work region clean and dry.
- Don't spray water or vapor in the cab.
- Never do refueling, lubrication and other maintenance work while the machine moves.
- d federico 2022-09-06 Keep your hands, feet and clothes off the rotary parts.

2.4.2 Self-preparation

The machine can be maintained or repaired by approved workers only. An observer could be assigned if necessary.

- · Wear protection suit and safety shoes required by the work.
- · When you remove spring, flexible components or add acid to the battery, please wear face shield. Wear helmets and eve protection when you weld or cut something.
- During cleaning with compressed air, flying \(\) granules may cause personal injury. Therefore please wear goggles, dust mask, gloves and other protective equipment.
- When knocking hard metal part with a hammer, such as pin, bucket teeth, cutting edge or bearing, parts and metal fragments flying off will lead to injury. Therefore please wear goggles and gloves and keep anyone off the surrounding area.
- Don't conduct grinding, flame cutting or welding if breather or ventilation equipment is not available. If it is necessary to perform welding on the hydraulic excavator, refer to relevant manual for correct procedures.



Fig.2-79

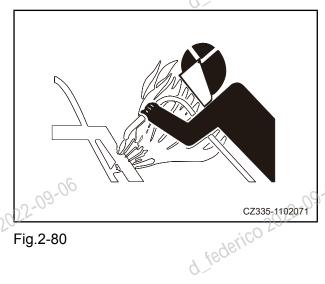


Fig.2-80

3rico 2022-09-06

- If the machine creates too much noise, it may lead to temporary or permanent hearing problem. When maintaining the engine, please wear ear muff or plug before working in the noise for a long time.
- Please wear rubber apron and rubber gloves when contacting corrosive materials. Please wear protective gloves when handling wooden materials, wire ropes or metal with sharp edge.

2.4.3 Preparation of working area

- sufficient light, good ventilation, clean and flat ground for maintenance.

 Clean the working Select a working area with enough space, flat ground for maintenance.
- · Clean the working ground, wipe off fuel, lubricant and water, and cover the slippery ground with sand or other adsorptive materials.
- · Don't leave hammer or other tools in the working area.
- If you fail to keep the working area clean d. federico 2022-09-06 and tidy, there will be the danger of stumble, slip and fall, leading to personal injury. d federico

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

2.4.4 Steps of engine shutdown before maintenance

Before maintaining the machine:

- Park the machine on a solid and flat ground.
- Lower down the bucket to the ground.
- Place cushion blocks under the track to prevent the machine from moving.
- Turn the accelerator control knob to "1" position to run the engine at a low idle speed and under no load for 5 min.
- Turn the ignition switch to "OFF" position to shut down the engine.
- Turn the switch to [ON] position and move the control lever to the front, back, left and right twice and three times respectively to release pressure in the hydraulic system.
- Take off the key from the ignition switch.
- Turn the safety lock control lever to "LOCK" position.

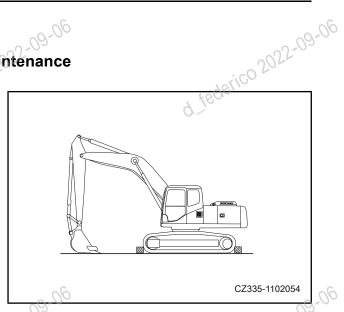
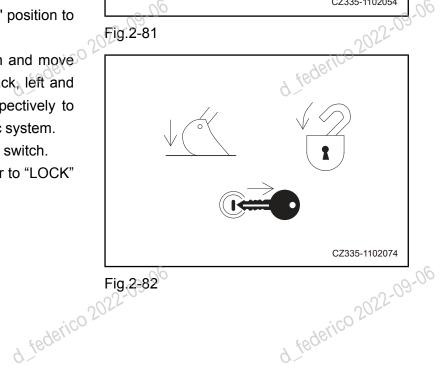


Fig.2-81



d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

• Hang up "No Operation" decal or similar warning decal on the ignition switch rection control decid to warn others that the machine is under maintenance.

If necessary, an additional warning decal can be attached around the hydraulic excavator

 If someone starts the engine, contacts and operates the control lever or pedal during d federico 202 maintenance, it will lead to severe accident.

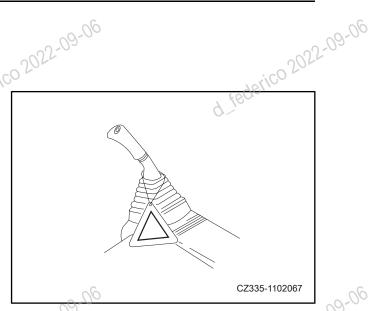


Fig.2-83

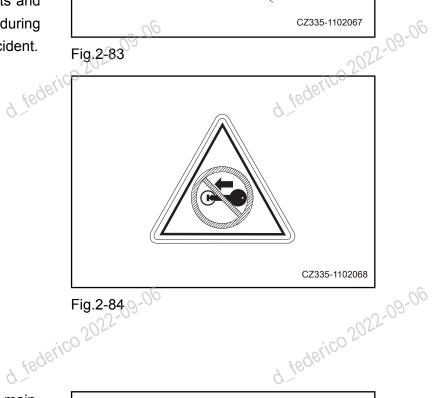
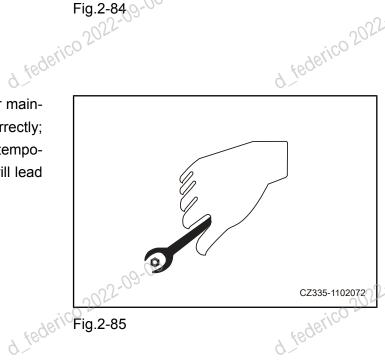


Fig.2-84

Sico 2022-09-06 2.4.6 Proper tools

d_federico 2022-09-06

 Only proper tools can be selected for maintenance and they shall be used correctly; using damaged, bad, defective and temporary tools or incorrectly using tools will lead to severe accident.



2.4.7 Maintenance during engine running

Don't maintain the machine when the engine runs to prevent injury. If necessary, the maintenance during engine running requires at least 2 workers and shall be conducted as the followings:

- One worker must sit in the driver's seat all the time and be ready to shut down the engine at any time. All workers must keep in touch.
- Turn the safety lock control lever to "LOCK" position to prevent the work equipment from moving unexpectedly.
- Operation near the fan, fan belt or other rotary components will cause the danger of being rolled by the components. Please pay greater attention to it.
- Tools or other objects shall not fall into fan or fan belt, otherwise, parts will be broken or fly off.
- Don't touch any control levers. If necessary, please signal others and warn them to move to a safe place.

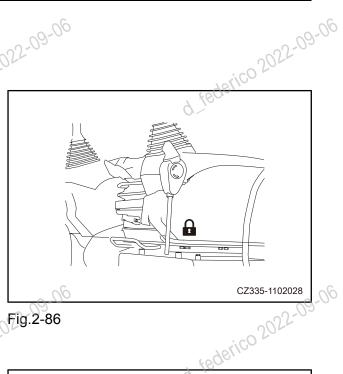
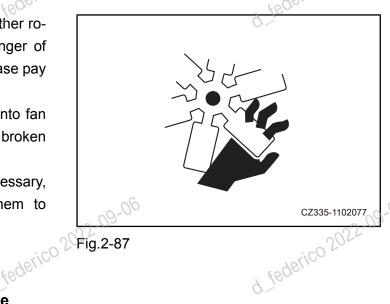


Fig.2-86



d federico 21 2.4.8 Operation under the machine

- Don't maintain the machine before well supporting it.
- Lower down the work equipment to the ground before maintenance.
- If the machine or the work equipment must be lifted for maintenance, support it firmly with cushion block or bracket of sufficient strength, rather than slag brick, cord tyre or shelf, don't support the machine by a single tedejack.
 - If the track shoe leaves the ground while the machine is only supported by the work



Fig.2-88

is damaged or the control lever is contacted by accident, the work equipment chine may fall a casualty. Therefore never work under the hydraulic excavator if it is not firmly supported by the cushion blocks or brackets.

2.4.9 Track maintenance

- Keep proper track tension. During operation
 on mud and snow ground, mud and will stick to the fi on mud and snow ground, mud and show too tight. In that case, please adjust track tension according to the operation manual of the product.
- Check if the track shoe is loose or broken. and if the track pin and the track bushing are worn or damaged, and check the track

- Don't knock the track tension springs, as they may bear huge pressure and suddenly, leading. springs under compression condition. Tension spring should not be compressed.
- Follow the track maintenance guidance provided by the manufacturer.

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

2.4.10 Safety precautions for track tension adjustment

- Grease is pressed into the track tension adjustment system under a high pressure condition.
 - To loosen track tension, slowly loosen the grease drain plug and don't unscrew it for more than one turn.

WARNING

- Failure to follow the specified maintenance process during adjustment will cause flying off of the grease drain plug, leading to severe injury or damage.
- Keep your face, hands, feet or other parts of the body off the drain hole of the grease drain plug.

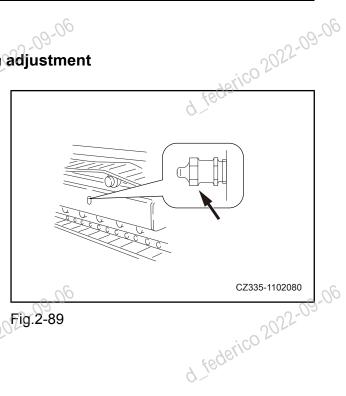


Fig.2-89

2.4.11 Don't remove the buffer spring

 Buffer spring assembly is used for reducing the impact force of the guide wheel. It comprises a high pressure spring, which, if incorrectly removed, will cause flying off of the spring, leading to severe casualty. If the buffer spring assembly must be removed, please contact the agents authorized by Sany Heavy Machinery Co., Ltd. to conduct this operation.

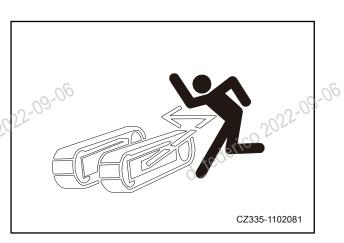


Fig.2-90



d. federico 2022-09-06

As temperature of engine increases, pressure in cooling system builds up. Stop the cooling system to allow the system to moval of radiator cap. You should not remove it until the coolant cools down.

WARNING

· Contacting hot high pressure coolant will cause severe injury.



Fig.2-91 jederico 2

ederico 2022-09-06 2.4.13 Safe operation of high pressure hose

If leakage is found in the high-pressure hose, it may cause an operational failure and even lead to a fire. If bolts on the hose come loose, stop working and tighten the bolts to specified torque. If any damage is discovered in the hose, please stop operation at once and con-Replace the hose at once when the following problems are discovered:

• Hydraulic tubo

- leak.
- The covering is worn or broken, or steel wire of the reinforcement layer is exposed.
- Some parts of the covering swell.
- There are impurities inside the covering.
- Removable parts are twisty or squashed. d federico 2022-09-06

d. federico 2022-09-06



2.4.14 Be careful of high pressure liquid

Pressure always exists in the hydraulic system. When you check or replace the hose, always check if pressure in the hydraulic oil line has been relieved. If there is remaining pressure in the hydraulic oil line, serious accidents will occur. Therefore, it is important to observe following rules:

- Release system pressure before maintaining the hydraulic system;
- 1) Screw off the butterfly nut of the breather valve, and press the exhaust button to release the internal pressure in the hydraulic tedetank.
 - 2) Release pressure in pilot lines group. In 15 seconds after shutdown, turn the key switch to ON position, set the safety lock control lever to unlock position, and move the travel control lever and the left and right joysticks to all directions to release pressure in the accumulator.
 - Keep the hydraulic system off any open flame, and eliminate splashing hydraulic oil. if any, at once.
- Diesel or hydraulic fluid under pressure is able to penetrate skin or eyes, leading to cult to check if the pressurized hydraulic oil leaks with naked eyes. You need to find leakage with a piece of cardboard or wood chip instead of touching leaked oil directly. Wear a face mask or protective goggles to protect your eyes. If oil penetrates your skin, rinse it with water and seek medical attention as soon as possible.
 - will arise inside the fuel pipeline. And fuel steel pipe between the high pressure When the engine is running, high pressure steel pipe between the high pressure fuel pump and the fuel nozzle will be under high pressure. Therefore, before checking or

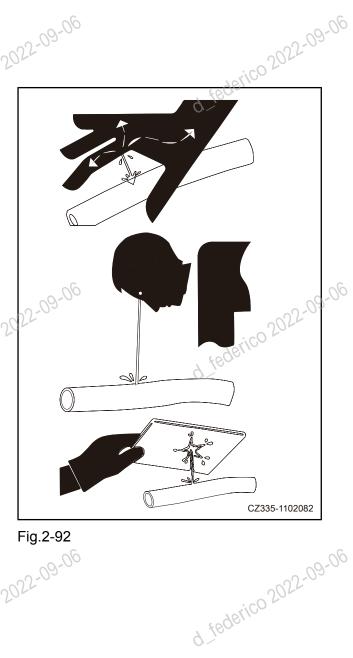


Fig.2-92



d_federico 2022-09-06

down, to allow the internal pressure of the system to reduce.

2.4.15 Welding operation

There is a risk of fire or electric shock during welding, therefore, welding must be carried out by qualified welders with appropriate equipment. Unqualified personnel are not allowed for welding.

2.4.16 Safe maintenance of HVAC group

- R134a refrigerant is a non-toxic gas at room temperature, but it turns into a highly gas when it exposes t
 - Keep the HVAC group away from fire source during maintenance.
 - · Please use the refrigerant correctly according to the instruction on the refrigerant container when maintaining the HVAC group. Use R134a as the refrigerant. Don't use other refrigerants. Otherwise, the HVAC group will be damaged.
 - If the refrigerant enters eyes, it may cause blindness; if it splashes on skin, it will cause cold injury.
 - It is strictly forbidden to discharge the refrigerant directly into the atmosphere, instead, a refrigerant circulation system should be used.



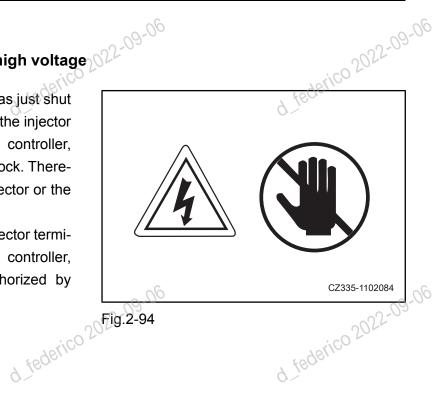
Fig.2-93

d federico 2022-09-06

d. federico 2022-09-06

2.4.17 Precautions related to high voltage

- When the engine is running or was just shut down, high pressure will arise in the injector terminal and inside the engine controller, causing the danger of electric shock. Therefore, please don't contact the injector or the inside of the engine controller.
- If it's necessary to contact the injector terminal or the inside of the engine controller, please contact the agents authorized by Sany Heavy Machinery Co., Ltd.



2.4.18 Accumulator

The accumulator is filled with high-pressure nitrogen, thus improper operation to the accumulator may cause an explosion, which may lead to serious accidents. Therefore please comply with the following precautions:

- Don't disassemble the accumulator.
- Keep the accumulator off fire source or do not expose it to fire.
- Don't punch, weld or cut by torch the accumulator.
- Don't collide with or roll the accumulator, or make it suffer any impact.
 - · Deflation is required for handling of the accumulator. Please contact the agents authorized by Sany Heavy Machinery Co., Ltd to conduct this operation.



Fig.2-95

2.4.19 Preventing the danger of fire and explosion

WARNING

 Don't smoke when handling fuel or maintaining the fuel system, as fuel vapor in the empty fuel tank is highly liable to explode. Don't conduct cutting and welding operation on the fuel pipe, fuel tank or other fuel containers. Otherwise fire and explosion may occur, leading to casualties.

- Please shut down the engine and turn off the electrical equipment when refueling the tank. Be extremely cautious when refueling the hot engine. nozzle.
- Please handle all solvents and dry chemicals according to the steps marked on the containers in a well-ventilated place.
- Clean away dust and residues on the machine, and don't place greasy cleaning cloth or other inflammable materials on it.
- Please clean parts with non-inflammable solvent rather than gasoline, diesel or other inflammable liquid.
- Store inflammable liquid and materials in proper containers according to safety regulations.
- federico 2022-09-06 Check if fire extinguisher, fire extinguishing system and fire detectors (if equipped) are ready for use.

2.4.20 Regular replacement of safety related parts

- To ensure long-term safe operation of the machine, parts related to safety such as hose, seat belt must be replaced regularly.
- Exceeding the specified replacement interval may cause aging problem of part materials. Overuse will lead to abrasion and damage, causing machine malfunction and personal injury. At the same time, it's hard to identify how long these parts can work well only through visual inspection or touch. Therefore regular replacement is necessary.
- Safety related parts, if defective, shall be replaced or repaired even before the specified replacement interval.

2.4.21 Maintenance operation

- ijco 2022-09-06 ico 2022-09-06 Check all components and parts and replace worn, broken and damaged ones during repair. Excessively worn and damaged components and parts will be inoperative during the operation of the machine, causing casualties. Replace damaged or illegible signal marks.
- Screw down all fasteners and connectors to specified torque.
- Install all guards, covers and shields after maintenance. Damaged guard boards shall be replaced or repaired. The system shall be refilled with the hydraulic fluid approved or suggested by Sany Heavy Machinery Co., Ltd only.
- Start the engine and check leakage condition (check the hydraulic system); then operate all control devices to confirm all functions of the machine are in well condition. Conduct road test if necwashers and nuts etc). Make sure to check all hydraulic fluid levels again before operating the machine. d federico d federico

2.4.22 Proper waste treatment

Improper disposal for waste may lead to environmental and ecological perils. Consult your local environmental collection center or Sany Heavy Machinery Co., Ltd. authorized distributor about collection or disposal methods.

- · Improper disposal for waste may lead to environmental and ecological perils. Consult your local environmental collection center or Sany Heavy Machinery Co., Ltd. authorized distributor about collection or disposal methods.
- Please store the drained liquid with a leakproof container instead of a food or drink container, as the latter may cause mistaken drinking.
- · Don't pour waste liquid onto the ground, into the sewer or any other water sources directly.
- Leakage of refrigerant will damage the earth atmosphere. Please recycle or regenerate the refrigerant according to relevant laws and regulations. d federico 2022:

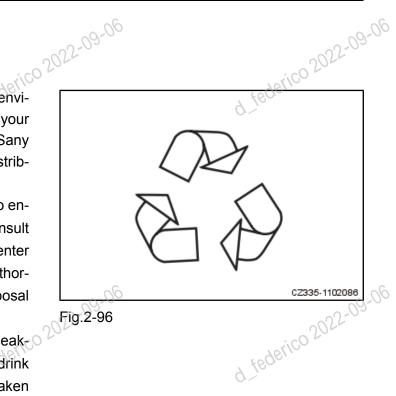
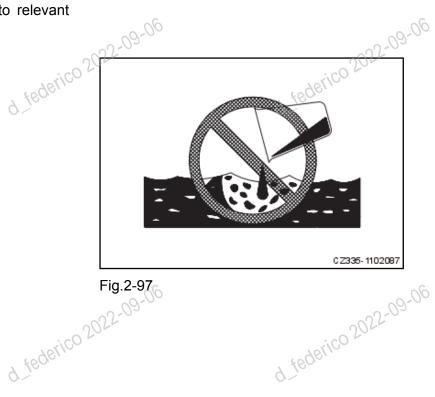


Fig.2-96



J.2-9 d_federico 2022-09-1 Fig.2-97

d federico 2022 09-06	d. fedeiro 2022-09-06	d. federico 2022-09-06
3 tederico 2022-09-06	09.06 0.2022-09.06	d. ederico 2022-09-06
1. federico 2022 09-06		d. federico 2022-09-06
d. federico 2022.09-06	d. 1ederico 2022-09-06	d. føderico 2022-09-06



Technical Specifications

20-00	20-00	20-0
3 Technical Specifications	2-05	3-1
3.1 Overall dimensions	- 1.9	3-3
3.2 Working range	³ 961.	3-4
3.3 Technical parameters		3-5

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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

d federico 2022-09

3.Technical Specifications

3.1 Overall dimensions

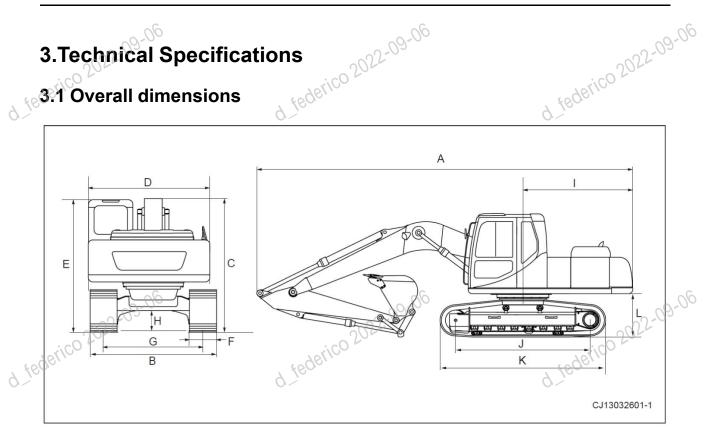


Fig.3-1

			Unit: mm
		Item	SY215CCM3K
_	Α	Overall length (for transportation)	9680
_	В	Overall width	2980
_	С	Overall height (for transportation)	3440
_	D 20	Width of superstructure	2710
180	76LLE	Overall height (top of the cab)	2990 tederio
9-10-	F	Standard track shoe width	600
=	G	Track gauge	2380
-	Н	Min. ground clearance (excluding the flange height of the track shoe)	440
_	I	Tail swing radius	2890
-	J	Ground contact length of track	3445
=	K	Track length	4250
_	L	Ground clearance of upper structure (excluding the flange height of the track shoe)	d federico 2022-09
_	-ico 20	shoe)	-ico 2011
d ted	761,	d feder.	d feder.

d federico 2022-09-06 d. federico 2022-09-06 3.2 Working range jederico 2022-09-06 d tederico 2000 d tederico 2022-09-06 CJ13032602-1

Fig.3-2

		Unit: mm
Name		SY215CCM3K
а	Max. digging height	9570
b	Max. dumping height	6700
C	Max. digging depth	6600
d,022-00	Max. vertical digging depth	5800
ederice *	Max. digging reach	9950 dei ^{co}
d f	Min. swing radius	3595
g	Max. height at min. swing radius	7665

3.3 Technical parameters

	3.3 Technical parameters	2022-09-06	2022-09-06
60	ltem	Jerico Unit	SY215CCM3K
9 10	Overall weight	kg	21800
•	Bucket capacity	m³	0.9
,	Engine model		Mitsubishi 4M50
·	Engine power	kW/rpm	118/2000 (w/o fan)
•	Traveling speed (high/low)	km/h	5.4/3.3
,	Swing speed	rpm	11

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d. tederico 2022.09.0	9 tegerico 5055-06	9. tegerico 2022-09-06
9 tegei/co 5055-00-0	6 2022-9-06 3.1ederico	Jedejco 2022-09-06
d. federico 2022-09-0	6 2022-99-06 3 f80eric 2022-99-06	0. federico 2022-09-06
d federico 2022 09-0	6 Jederico 2022-09-06	d. federico 2022-09-06



Operation

4.1 General drawing of machine		4-1
4.1 General drawing of machine		4-5
4.2 Description of controls and instrume	ents	4-6
4.2.1 Display	0>	4-6
4.2.2 Operation method of each page	ge of the display	4-10
4.2.3 Control panel and switches		4-21
4.2.3.1 General		4-21
4.2.3.2 Ignition switch		4-24
4.2.3.3 Throttle control knob		4-25
4.2.3.4 Working lamp switch		4-25
4.2.3.5 Ceiling lamp switch		4-26
4.2.3.6 Wiper switch	18,00	4-27
4.2.3.7 Washer switch	2027	4-27
4.2.3.8 Horn switch	1841CO =	4-28
4.2.3.6 Wiper switch	7. 9.	4-28
4.2.3.10 Cigar lighter and auxiliar	ry power supply	4-28
4.2.3.11 Preheating		4-29
4.2.3.12 Preheating indicator		4-29
4.2.3.13 Charging indicator		4-29
4.2.3.14 Mode selector knob		4-30
4.2.4 Control lever and pedal		4-30
4.2.4.1 General		4-30
4.2.4.2 Safety lock control lever		4-31
4.2.4.3 Traveling control mechani	nism	4-32
4.2.4.4 Joysticks	2012	4-33
4.2.4.2 Safety lock control lever 4.2.4.3 Traveling control mechani 4.2.4.4 Joysticks	Pilo	<u>4-34</u>
4.2.6 Windshield	976	4-35
4.2.7 Cab door window		4-42
4.2.8 Cup holder		4-43

000	0.
4.2.9 Ashtray 4.2.10 Information pack 4.2.11 Drink box 4.2.12 Emergency exit	4-43
4.2.10 Information pack	4-44
4.2.11 Drink box	4-44
4.2.12 Emergency exit	4-45
4.2.13 Fire Extinguisher	
4.2.14 Controller	4-46
4.2.15 Fuse link	4-46
4.2.16 HVAC group	4-47
4.2.16.1 Control panel	4-47
4.2.16.2 Control switch and LCD	4-47
4.2.16.3 Operation of A/C	4-52
4.2.16.4 Using A/C carefully	4-56
4.2.17 Radio	4-57
4.2.16.4 Using A/C carefully	4-57
4.2.17.2 Control button and LCD	4-58
4.2.17.3 Radio operation	4-60
4.2.18 Door lock	4-63
4.2.19 Cap with lock	4-64
4.2.19.1 General	
4.2.19.2 Opening and closing the cap with lock	4-65
4.2.19.3 Opening and closing the cover with lock	
4.2.20 Tool box	4-67
4.2.21 Lubricating grease pump rack (if equipped)	4-67
3 Operation and control of machine	4-67
3 Operation and control of machine	4,67
4.3.1.1 Walkaround inspection	4-67
4.3.1.2 Inspection before start	4-69
4.3.1.3 Adjustment before operation	
4.3.1.4 Operation before engine start	4-82
4.3.2 Engine start	4-83
4.3.3 Engine preheating	4-86
4.3.4 Warm-up operation	4-86
4.3.5 Shutting down the engine	4-87
4.3.6 Machine operation	4-88
4.3.6.1 General	4-88
4.3.6.2 Preparation for moving the machine	4-88
4.3.6.3 Moving the machine	4-89
4.3.6.4 Stopping the machine	4-90
4.3.6.1 General	4-91
4.3.7.1 General	4-91
4.3.7.2 Turning the machine when it stops	4-91

30.06	20.0
4.3.7.3 In-situ steering	4-93
4.3.8 Working mode selection	4-93
4.3.9 Control and operation of work	4-93
4.3.10 Prohibited operation	4-96
4.3.11 Allowable water depth	
4.3.12 Operation on a slope	4-99
4.3.12.1 General	4-99
4.3.12.2 Downhill traveling	4-101
4.3.12.3 Engine flameout on a slope	
4.3.12.4 Cab door when the machine is on a slope	4-101
4.3.13 Driving the machine out of the mud	
4.3.13.1 General	(19)
4.3.13.2 Track on one side gets stuck in the mud	
4.3.13.3 Tracks on both sides get stuck in the mud	4-102
4.3.14 Recommended purpose	4-103
4.3.14.1 General	4-103
4.3.14.2 Backhoe operation	4-103
4.3.14.3 Ditching operation	4-104
4.3.14.4 Loading operation	4-104
4.3.15 Parking	
4.3.16 Machine inspection after daily work	4-107
4.3.17 Locking	4-108
4.3.18 Operation in cold season	4-108
4.3.18.1 Description of operation in cold season	4-108
4.3.18.2 After daily work	4-109
4.3.18.3 After the cold season	4-110
4.3.19 Long-term storage	4-111
4.3.19.1 Before storage	4-111
4.3.19.2 During storage	4-111
4.3.19.3 After storage	4-112
4.3.19.4 Starting the engine after long-term storage	
4.4 Transportation	
4.4.1 General	
4.4.2 Transportation method	4-113
4.4.3 Machine loading and unloading with trailer	4-113
4.4.3.1 General	4-113
4.4.3.2 Loading	4-114
4.4.3 Machine loading and unloading with trailer 4.4.3.1 General 4.4.3.2 Loading 4.4.3.3 Securing 4.4.3.4 Unloading	4-116
4.4.3.4 Unloading	4-119
4.5 Lifting	4-121



d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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

d federico 2022-09

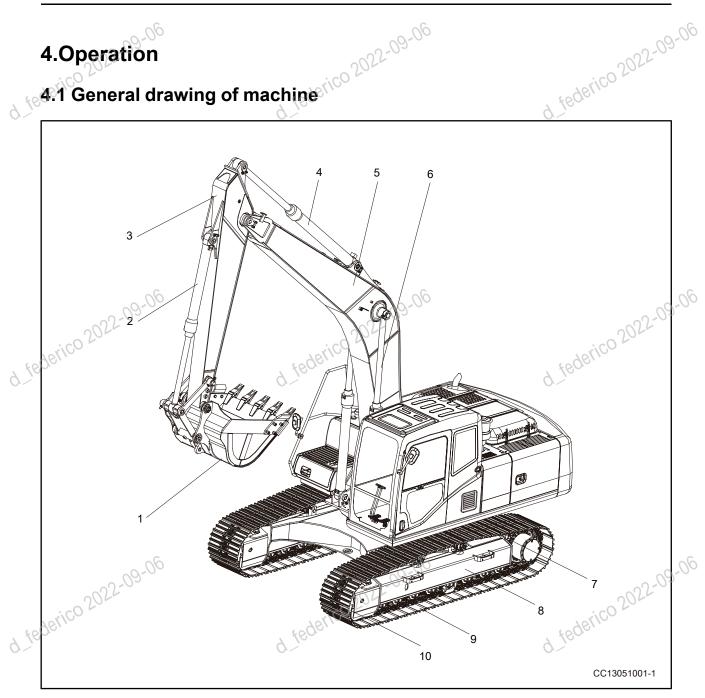


Fig.4-1

- [1] Bucket
- [2] Bucket cylinder
- Arm cylinder
 [5] Boom

- [6] Boom cylinder
- [7] Sprocket
- [8] Track frame
- Jahoe
 [10] Idler

4.2 Description of controls and instruments tederico 21

4.2.1 Display

CAUTION

- When the alarm indicator comes on, stop the operation immediately and check and repair relevant parts.
- The display can't display the whole working status of the machine.
- Do not rely on the display completely in case of maintenance and inspection of the machine.

The display panel has the functions of monitoring display, working mode selection and switching of electrical components.

Display appearance

This display mainly consists of 3 parts:

A: Alarm and signal indicator area

B: Main image display area

C: Key area

Alarm and signal indicator area

Fault alarm indicator lamp

The fault alarm indicator will turn on to remind the user of troubleshooting when the excavator is faulty.

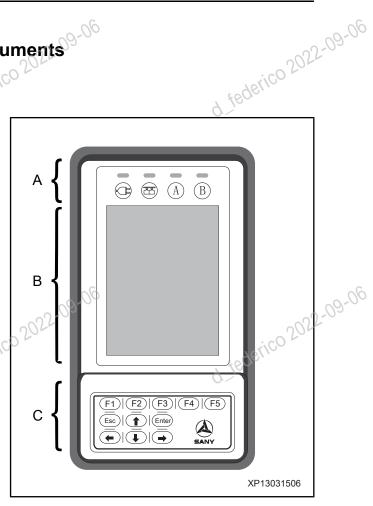
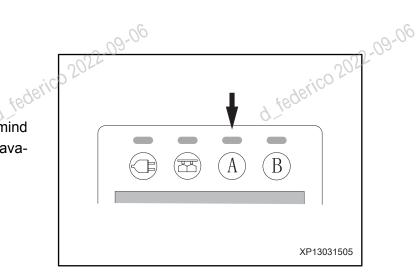


Fig.4-2



d_federico 2022-09-06 Fig.4-3



Main image display area

When the excavator ignition switch is turned to "ON", the display will be powered and started by the battery to enter the initial interface. The fullscreen display of the working state is shown in the right figure. Where:

- 1. Working mode
- 2. Coolant thermometer
- 3. Fuel level gauge
- 5. Machine working time
 - 6. Function icons
 - 7. Current time
 - 8. Current date
 - 9. GPS signal indication
 - 10. Engine position indication

The range has 13 divisions (yellow) indicating the temperature of 0~120°C. the temperature of 0~120°C. d feder

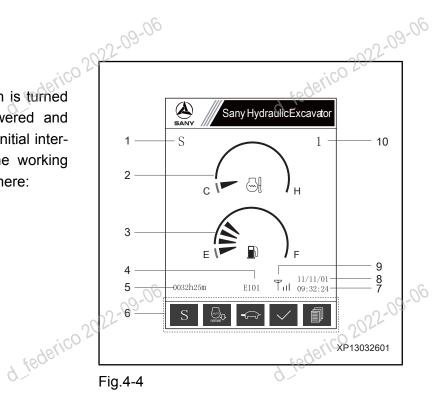


Fig.4-4



d_federico 2022-09-06

d_federico 2022-09-06

A: It is displayed when the engine is just started.

B: It is displayed at the temperature of 0~110°C.

C: It is displayed when the temperature is higher than 110°C. The last division will turn red and the alarm indicator will be on.

When the temperature returns below 110°C, indicator lamp will go out d federico 2022-09-06

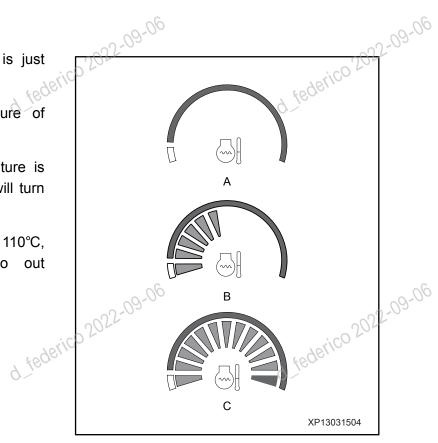


Fig.4-5

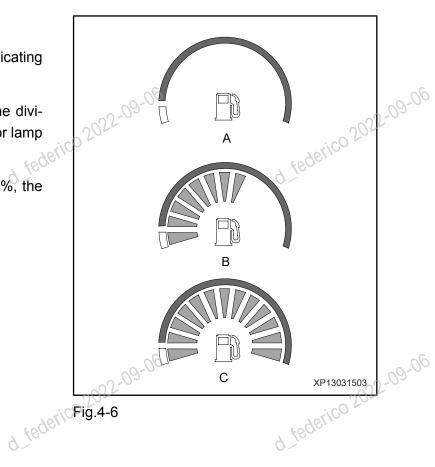
• Fuel level gauge:

The range has 13 divisions (yellow) indicating the fuel level of 0~100%.

A: When the fuel level is below 8%, the division will be blank and the alarm indicator lamp will turn on.

B: When the fuel level returns above 8%, the alarm indicator lamp will go out.

C: It is displayed when the fuel is full.



Key area 22-09-06

The key area includes function keys and operational keys.

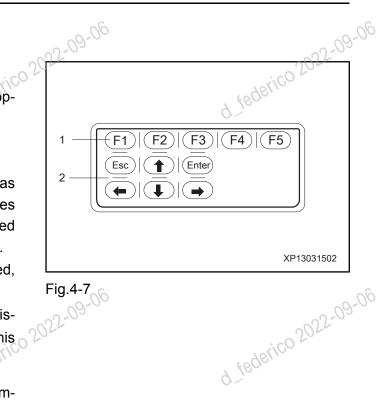
Function key

Function keys are F1, F2, F3, F4, and F5 (as shown in the right figure) with their purposes corresponding to the function icons displayed on the main image display area above them.

- When different function icons are displayed,
- Fig.4-7

 Played in the main image display area, this function button will be invalid. · When no corresponding function icon is disfunction button will be invalid.

The corresponding relationship between common function display icons and keys is shown in the table below.



Function key	Display icon	Function	Display range
F2	Q_{\bullet}	Idle/non-idle state switching	Idle/non-idle
F3		High/low traveling speed switching	High/low speed
Jarico 7F42	✓	Enter the selected/set item	The same as the operational key Enter
600		Select information query	9 1600
F5	J	Return to the previous interface	The same as the operational key Esc

Operational key

Operational key	Function	
Enter	Enter the selected/set item	
ESC	Return to the previous interface	
derico 2022-0938	Select the upper item (select the lowermost item after selection of the uppermost item) Progressive increase of the value at the cursor position	
•	Select the lower item (select the uppermost item after selection of the lowermost item) Progressive decrease of the value at the cursor position	



30-06	30.00
Operational key	Function
d_federico -	Select the left item (select the rightmost item after selection of the leftmost item) Move the cursor leftwards
→	Select the right item (select the leftmost item after selection of the rightmost item) Move the cursor rightwards

4.2.2 Operation method of each page of the display

Home page

The home page is the operation interface when the excavator works normally.

Operation methods

1. Working mode selection

Turn the mode selector knob to switch the working modes as follows: $B \rightarrow L \rightarrow E \rightarrow S$ (see 4.2.3.13)

Note: The default working mode is mode S.

2. Automatic idle speed selection

Use to cancel and start the automatic idle speed function.

When above the button, the symbol is displayed, press down this button to cancel the automatic idle speed function; when the symbol is displayed above the button, press down this button to activate the automatic idle speed function.

Note: The default mode of the automatic idle speed is the "Start" mode each time the machine is powered on.

By default, the automatic idle speed switch is turned on. When all travel levers are put in the neutral position for 0.2 s, the engine will decelerate by 100 rpm immediately and then enter the idle state automatically after 3 s (the controller will automatically adjust the speed to the idle speed) to save fuel and reduce noise.



Fig.4-8



change in the idle state, the engine will automatically return to the speed continuation to the speed continuation. • If the controller detects an action or position tomatically return to the speed corresponding to the position.

3. High/low traveling speed selection

Use so to realize switching between "High Traveling Speed" and "Low Traveling Speed". When above the button , the symbol is displayed, press down this button to select high traveling speed; when the symbol so is displayed above the button, press down this but-

speed.

The default traveling speed is the low speed when the machine is powered on each time. time.

4. Fault information query

When the alarm indicator comes on on the display, a DTC will appear at the bottom of the display. At this time, above the button [4], the red symbol will appear.

Press down this key to enter the fault information query page.

5. System information query

ico 2022-09-06 Press to enter the system information query page.

Note: Enter the password before entering the system information page. Please contact the local SANY agent to obtain the password.

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

Press on the "Main Page" to enter the "Information Query - Password" page. Fnto password before ent List" page.

Key operation

- Press
 or
 and
 to achieve progressive increase or decrease of the number in the password digit indicated by the cursor.
- Press
 or
 and
 to move the cursor leftwards or rightwards.
- Press (to enter the "System Unlocking" page.
- Press
 to enter the "Backlight Adjustment"
- Press
 or
 to return to the "Home Page".
- Press to confirm the correctness of the password. If it is correct, switch to the "Information List" page.

Information List

Input the correct password on the "Password" page and press to enter the "Information" List" page. 2

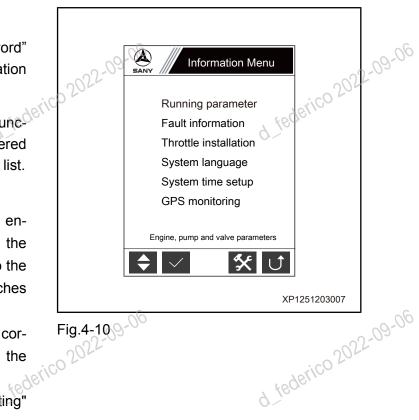
This page is used to display the system function list. Different pages can be entered through selection of different entries in the list.

Key operation

- tries in the system function list, move the cursor from top to bottom, and return to the topmost position when the cursor reaches the bottom.
- Press
 or
 or
 Enter to enter the page corresponding to the entry selected by the cursor.
- Press to switch to the "System Setting"
- Press
 or
 to return to the "Home Page".



Fig.4-9





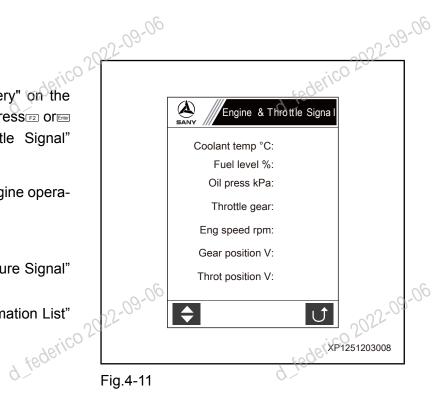
Engine and throttle signal

Select "Operation Information Query" on the "Information List" page, and then press or or to enter the "Engine and Throttle Signal" page.

This page is used to display the engine operation parameters.

Key operation

- Press
 to switch to "Pilot Pressure Signal" page.
- Press or to return to "Information List" page. d feder



Pilot pressure signal

Press on the "Engine and Throttle Signal" page to enter the "Pilot Pressure Signal" page.

This page is used to display the pilot pressure

- Press to switch to the "Main Pump and Main Valve Signal" page.

 Press or **
- page.

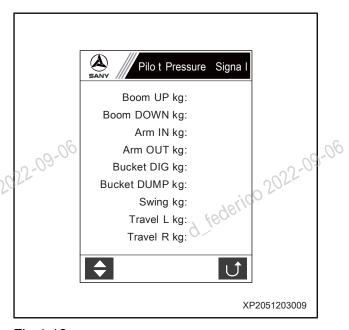


Fig.4-12





6.Main Pump & Main Valve Signal

Main pump and main valve signal

Presse on the "Pilot Pressure Signal" page to enter the "Main Pump and Main Valve Signal" page.

This page is used to display the main pump and main valve signal.

Key operation

- Press to switch to "Engine and Throttle Signal".
- Press so or to return to "Information List" page.

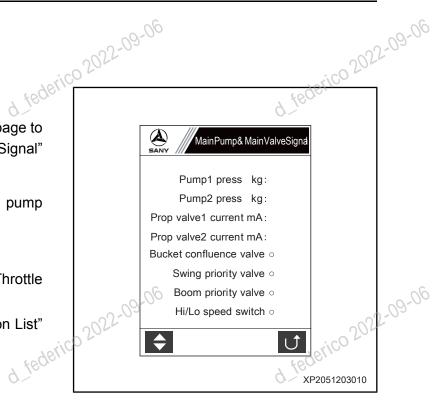


Fig.4-13

DTC query

Select "DTC Query" on the "Information List" page, and then press page or to enter this page.

This page is used to display the DTC and information.

Key operation

- Press to switch to the DTC on the next page.
- Press
 or
 to return to "Information List".

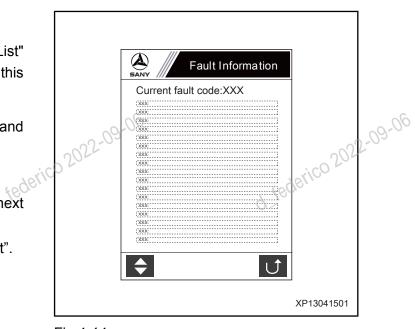


Fig.4-14

d_federico 2022-09-06



Throttle Mounting Aid

Select "Throttle Mounting Aid" on the "Information List" page, and then press or to enter this page.

This page is used to achieve the throttle mounting aid function.

Key operation

- Press to select automatic idle speed or full speed.
- Press
 ito select high or low speed.
- When the controller model is SYFCS, press to display the full speed.
- Press sors to return to "Information List"

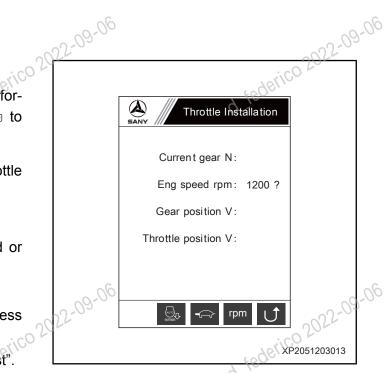


Fig.4-15

System Language Selection

Select "System Language Selection" on the "Information List" page, and then press or or to enter this page.

This page is used to select the system language.

- Press and to move the cursor upward or downward to select different entries in the list.

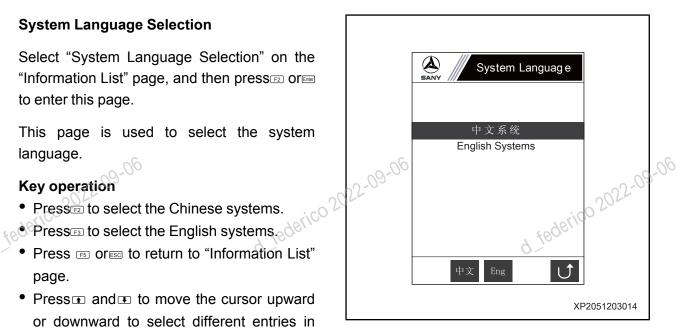


Fig.4-16





Select "System Time Calibration" on the "Information List" page, and then presses an enter this page.

This page is used to set the system clock.

Key operation

- Press and to achieve progressive increase or decrease of the number at the cursor position.
- Press
 = and
 = to move the cursor leftwards or rightwards.
- Press
 or
 to confirm the calibration result. The prompt of "Calibration is OK." Power off and restart the machine!" is displayed on the page.
- Press or or to return to "Information List".

NOTE:

Note: Once the system clock is powered on, it can only be calibrated once. After the poweron, press down or or, and the interface will always display the calibration result!

GPS monitoring information

Select "GPS Monitoring Information" on the "Information List" page, and then press or or to enter this page.

This page is used to display the GPS monitoring information.

Key operation

d federico 2022-09-06

Press
 s or
 or
 to return to "Information List".

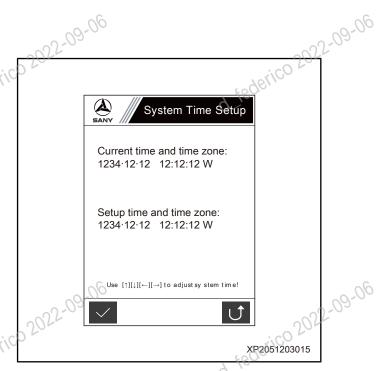


Fig.4-17

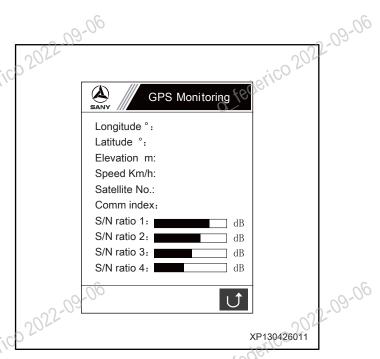


Fig.4-18

System setting list

Press
on the "Information List" page to enter the "System Setting" page. This page is used to set the machine configuration.

NOTE ·

Enter the password before entering the "System Setting" page. For the password entry method, see "Information Query - Password Entry".

Key operation

- Press or and to select different entries in the system function list, move the cursor from top to bottom, and return to the topmost position when the cursor reaches the bottom.
 - Presse或量 or Enter to enter the page corresponding to the entry selected by the cursor.
 - Press sors to return to "Information List".

Machine configuration

Select "Machine Configuration Query" on the to enter this page. This page is used to query the machine configuration.

NOTE:

Enter the password before entering the "Machine Configuration" page. For the password entry method, see "Information Query - Password Entry".

Key operation

 Press
 or
 or
 to return to "System Setting". J. federico 2022-09-06

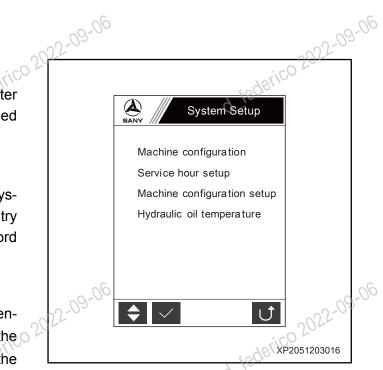
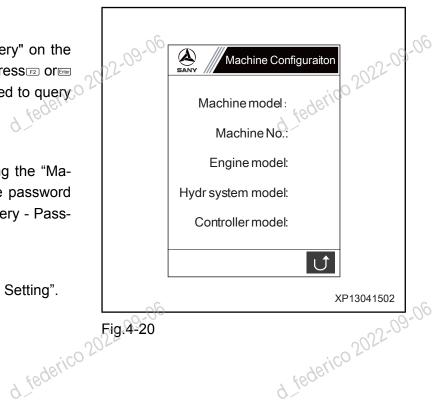


Fig.4-19





Select "Working Time Calibration" on the "System Setting" page, and then pressor to enter this page. This working time.

NOTE:

Enter the password before entering the "Working Time Calibration" page. For the password entry method, see "Information Query - Password Entry".

Key operation

- After calibration, press
 or
 to confirm the calibration result. The prompt of "Calibration is OK. Power off and restart the machine!" is displayed on the page.
- Press
 or
 or
 to return to "System Setting".

Machine configuration calibration

Select "Machine Configuration Calibration" on the "System Setting" page, and then press or to enter this page. This page is used to calibrate the machine configuration after the display is installed.

NOTE

Enter the password before entering the "Machine Configuration Calibration" page. For the password entry method, see "Information Query - Password Entry".

Key operation

- When the number behind the machine model flashes, the number will be increased by 10 every time is pressed.
- Every time is pressed, the hydraulic system model on the corresponding not be changed one.

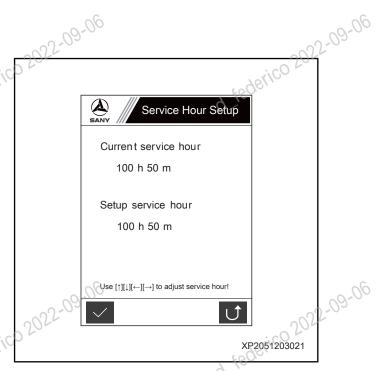


Fig.4-21

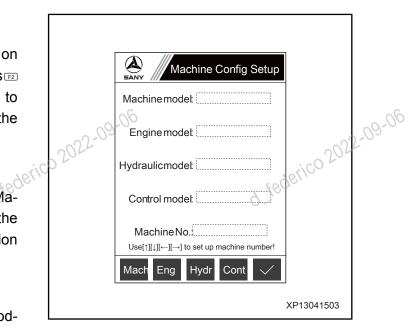


Fig.4-22



d_federico 2022-09-06

- el on the corresponding page will be changed once. • Every time is pressed, the controller modchanged once.
 - Press to confirm the calibrated content, and the prompt of "Calibration is OK. Power-off and restart the machine" will be displayed.
 - Press or o achieve progressive increase and decrease of the selected machine ID, with a magnitude of (100).
 - Press

 or

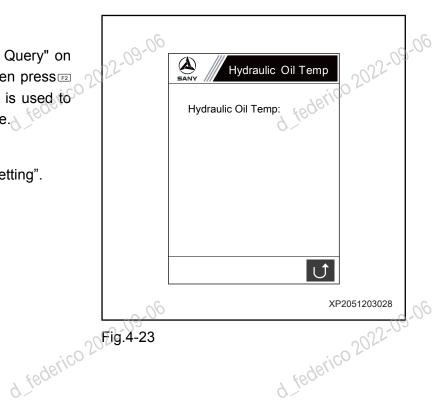
 to achieve progressive inwith a magnitude of (1) through short-time press and a capability of rapid decrease or increase through the press press.
 - Press to return to "System Setting".
 - Every time the button is pressed, the number behind the machine ID or model will flash, and then the corresponding value can be changed by pressing the button.

Hydraulic oil temperature

Select "Hydraulic Oil Temperature Query" on the "System Setting" page, and then press or to enter this page. This page is used to display the hydraulic oil temperature.

Key operation

Press
 or
 return to "System Setting".



Press on the "Information Query - Pass-word" page to enter this page. This no used to adjust the hos!" display.

Key operation

- Press
 to decrease the brightness of backlight.
- Press 🗈 to increase the brightness of backlight.
- Press
 to save the backlight adjustment.
- Press
 to return to the "Information Query" page.



Fig.4-24

Level I locking interface

The appearance of this page on the display indicates that the excavator is set in the Level I locking state.

Key operation

• Press
to enter the system unlocking page.

NOTE

The corresponding state is displayed based on the command after 5 s: "Level I Locking", "Level II Locking" or "No Locking". (The purpose of waiting for 5 s is to achieve filtering.)

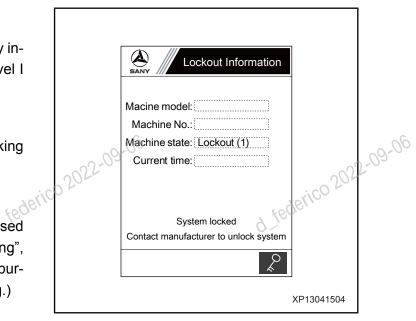


Fig.4-25

d federico 2022-09-06



Level II locking interface

The appearance of this page on the display indicates that the excavator is set in the Level II locking state.

Key operation

• Press so to enter the system unlocking page.

NOTE:

The corresponding state is displayed based on the command after 5 s: "Level I Locking", "Level II Locking" or "No Locking". (The purpose of waiting for 5 s is to achieve filtering.)

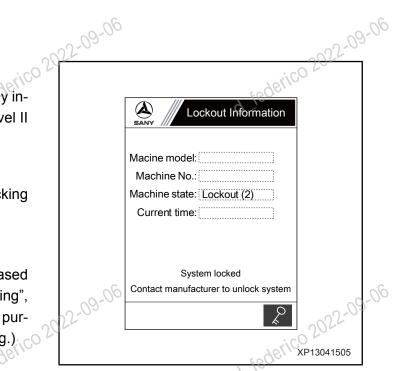


Fig.4-26

4.2.3 Control panel and switches

4.2.3.1 General

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

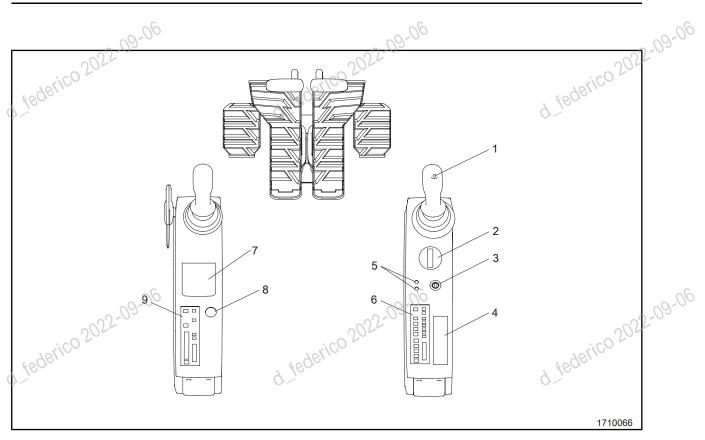


Fig.4-27

- [1] Horn switch
- [2] Throttle control knob
- [3] Ignition switch
- [4] Mobile phone box
- [5] Indicator 2 d federico 2

- [6] Radio
- [7] Storage box
- [8] 24V cigar lighter d federico 2022-09-06

d. federico 2022-09-06

d federico 2022-09-06



Table of functions of buttons:

	No.	lcon	Main function	Remarks
	1	Time	Working lamp switch	
	2	开	Cab ceiling lamp, platform lamp switch	
	3	00	Washer switch	10.00
	derico 2022	Lti Hi	Wiper switch	48.rico 202223
9 16	5	OBD	Fault reading	OBD+SHIFT
	6	CLEAR	Fault clearing	CLEAR+SHIFT

The ignition switch is used to start or shut down the engine. The ignition switch has positions: HEAT, OFF

OFF position

The key can be inserted or removed. Both the switches of the electric system (except the outdoor lamp) and the engine are turned off.

ON position

The current will flow through the charge and the lamp circuit. When the engine is running, the starting switch key will remain in this position.

START position

This is the engine start position. The key will remain in this position upon start. Immediately release the key after the engine start. It will automatically return to the [ON] position.

HEAT position

position and keep it at the position to preheat the engine. After released, the kev will an antically return to " preheating.

Note: For the machine equipped with preheater switch, the engine preheating method may be different. The [HEAT] position of ignition switch for some models is invalid. For details, see the Section "Preheater switch" on Page 4d federico 2022-09-06 d. federico 2022-09-06

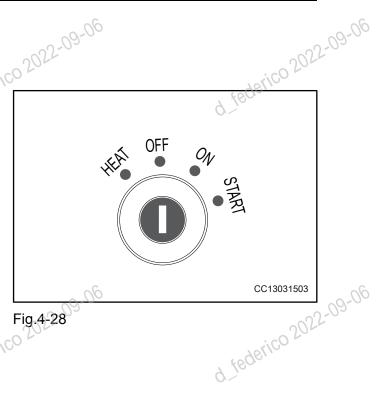


Fig.4-28

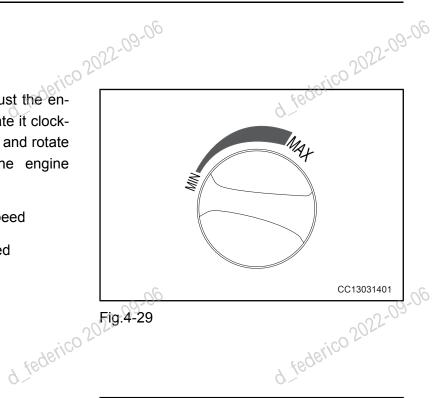


4.2.3.3 Throttle control knob

The throttle knob can be used adjust the engine speed and output power. Rotate it clockwise to increase the engine speed, and rotate it counterclockwise to reduce the engine speed.

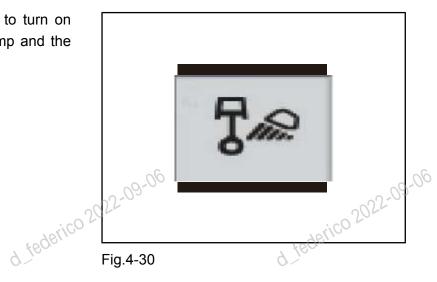
Leftmost position [MIN]: Low idle speed

Rightmost position [MAX]: Full speed



rico 2022-09-06 4.2.3.4 Working lamp switch

The working lamp switch is used to turn on and turn off the boom working lamp and the platform working lamp.



d federico 2022-09-06

Working lamp position

a. Boom working lamp—2

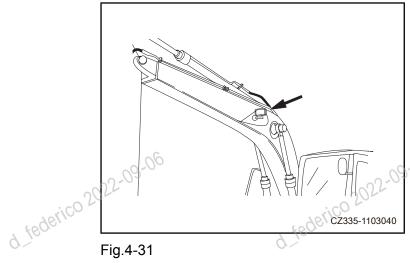


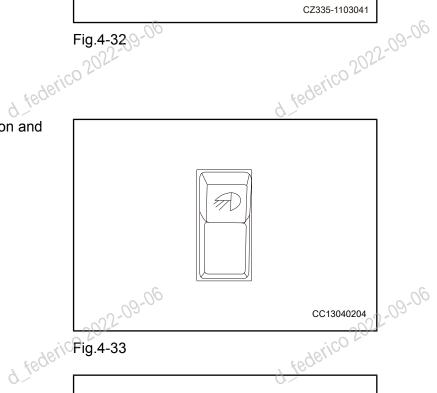
Fig.4-31

b. Right platform working lamp—1 d tedericc

d. federico 2022-09-06 kege<u>lico 5035</u>-00-00 Fig.4-329-00 CZ335-1103041

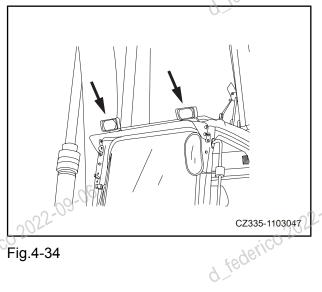
4.2.3.5 Ceiling lamp switch

The ceiling lamp switch is used to turn on and turn off the external ceiling lamp of cab.



federico 2022-09-06

Ceiling lamp position



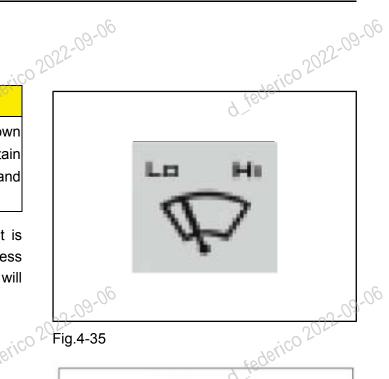
d federic Fig.4-34

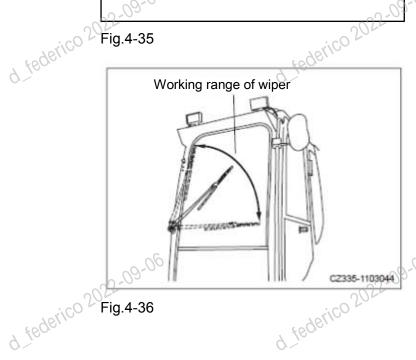
4.2.3.6 Wiper switch

CAUTION

 When using the wiper, please press down the washer switch to spray a certain amount of detergent to prevent friction and damage of the wiper.

When the wiper shall be opened when it is raining or the front windshield is dirty, press d federico 2022-09-06 down the wiper switch, and the wiper will





d federico 2022-09-06 4.2.3.7 Washer switch

A CAUTION

· Before pressing down the switch, it is necessary to confirm that the front windshield of the cab is closed.

Press down the washer switch to spray the detergent. Press down and hold this switch, and the detergent will be sprayed continuously;

After release, the switch will bounce back automatically and the detergent will not be sprayed anymore.

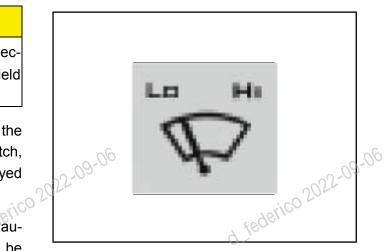


Fig.4-37

The horn switch is installed on the top of the right control lever, which is used to sound horn.

Press down and hold the switch, and the horn will sound continuously.

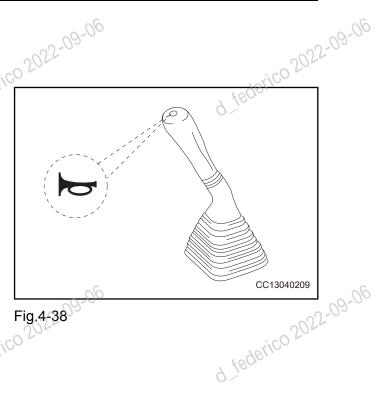


Fig.4-38 d federico 20

rico 2022-09-06 4.2.3.9 Indoor lamp switch

The indoor lamp is installed inside the cab, and the indoor lamp switch can be pressed down to "Turn On" or "Turn Off" the indoor lamp of cab.

Position [a]: The lamp is turned on

Position [b]: The lamp is turned off

NOTE:

Even though the ignition switch is at OFF position, the indoor lamp can be turned on.

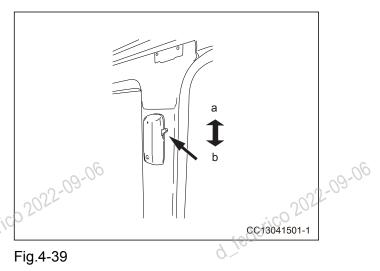


Fig.4-39

4.2.3.10 Cigar lighter and auxiliary power supply

Use a cigar lighter when lighting a cigarette.

When a cigar lighter is pushed in, it will return to its original position a few seconds later, and it can be used after removal.

If the cigar lighter is removed, its socket can be used as the power supply not higher than 240 W (24 V×10 A).

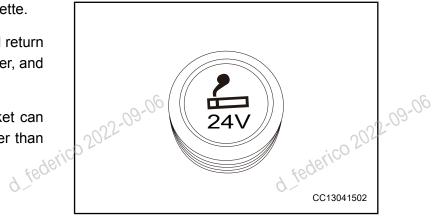


Fig.4-40



d_federico 2022-09-06

This cigar lighter is 24 V, and it can't be used as the power supply of 12 V equipment NOTE 122-09-06 as the power supply of 12 V equipment.

4.2.3.11 Preheating

For the machine equipped with a 4M50 engine, the electrical system automatically preheats the engine. When the atmospheric temperature is below 0° C, turn the ignition switch to ON position and wait for 8 seconds.

During engine preheating in case the coolant temperature is too low, the preheating in the state of the coolant too low. tor [1] comes on. After preheating, the indicator goes out, after which the engine may be started.

4.2.3.13 Charging indicator

The charging indicator [2] comes on when the ignition switch is at ON position; the indicator goes out when the engine is running and the alternator works normally; if the indicator d. federico 2022 stays on, check if the alternator is faulty.

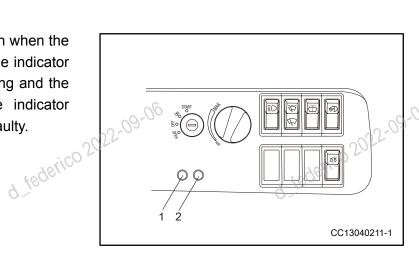


Fig.4-41

d. federico 2022-09-06

d federico 2022-09-06

B Breaker mode

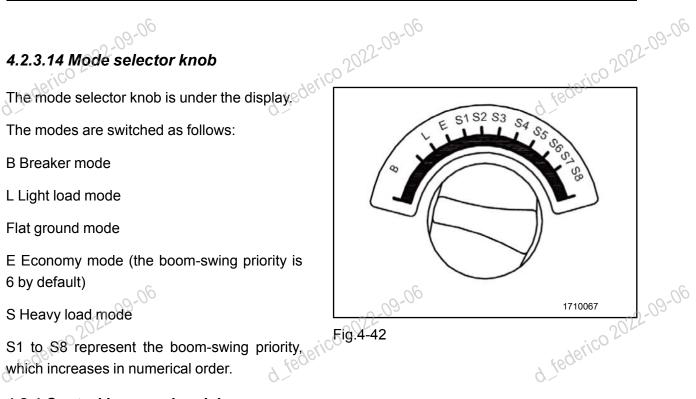
L Light load mode

Flat ground mode

E Economy mode (the boom-swing priority is 6 by default)

S Heavy load mode

S1 to S8 represent the boom-swing priority, which increases in purporical and which increases in numerical order.



4.2.4 Control lever and pedal

4.2.4.1 General

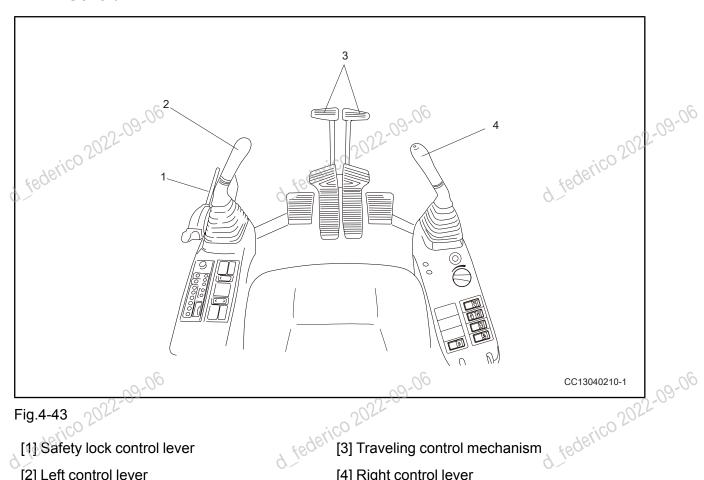


Fig.4-43

- [1] Safety lock control lever
- [2] Left control lever

- [3] Traveling control mechanism
- [4] Right control lever

d_federico 2022-09-06

4.2.4.2 Safety lock control lever

WARNING

- When leaving the cab, the safety lock control lever shall be firmly located at the locking position. If the safety lock control lever is not in the locking position, accidental touching of the control lever can cause serious casualties.
- If the safety lock control lever is not firmly located at the locking position, movement of the control lever can cause serious accidents. The inspection of the control lever is as shown in the Figure.
 When pulling or the control lever is as shown in the Figure.
- When pulling or pushing the safety lock control lever, do not touch the left control lever.

A safety lock control lever is a device that locks the work equipment, and swing, traveling and accessory (if equipped) control levers.

- a LOCK position: Push the safety lock control lever downwards for locking. The machine will not move even if the control lever is operated.
- UNLOCK position: The machine will move according to operation of the control lever.

The lever is a hydraulic locking lever. Therefore, when it is locked, the control lever or the control pedal will move, but the machine will not move.

When all the controllers are in the neutral position and the safety lock control lever is pushed to the unlocking position, if any part of the machine (has movement tendency) moves, it indicates that the machine has fault. In this case, immediately pull the safety lock control lever back to the LOCK position and

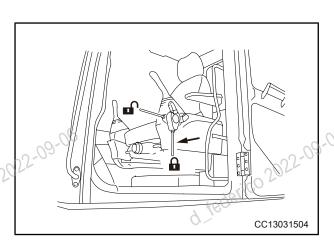


Fig.4-44

rico 2022-09-06

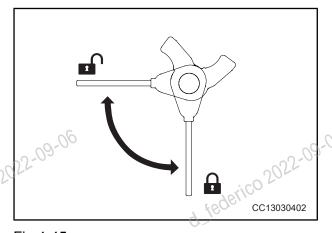


Fig.4-45



unery or its authorized agent.

4.2.4.3 Traveling control mechanism

- Do not put your feet on the pedal while operating. If the pedal is stepped down accidentally, the machine will suddenly move and cause a serious accident.
- Please be cautious when using a pedal for traveling or steering. Do not put your feet on the pedal when you do not use the pedal.

The travel lever and traveling control pedal (as shown in the right Figure) are used to control machine traveling and change traveling direction of the machine.

[a] Forward:

Push the travel lever forwards (or step down front part of pedal)

[b] Reverse:

Pull the travel lever backwards (or step down rear part of pedal)

[N] Stop the machine (return the control lever and pedal to the neutral position)

NOTE:

Confirm the sprocket position before operating the control lever or pedal. Ensure that the sprocket is at the back of the machine. If the sprocket is in front of the machine and the travel lever is pushed forwards, the machine d.federico 2022-09-06 will move backwards. d federico 2022-09

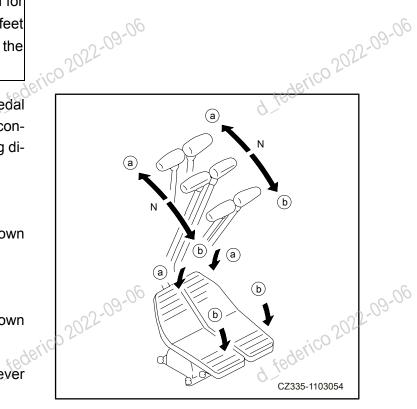


Fig.4-46



d_federico 2022-09-06

4.2.4.4 Joysticks

WARNING

- d federico 2022-09-06 Do not extend any part of your body out of the window. If you knock into the boom joystick accidentally or for other reasons, you may be hit by the boom. If the window is lost or damaged, it shall be repaired or replaced immediately.
- Before operation, be familiar with the position and function of each joystick to prevent injury caused by accidental movement of the machine.

The following is an example of the SAE mode. For details, see the "Work Equipment Control and Operation" on page 4-91.

Left control lever

Action of the left control lever				
1	Front	Arm dumping		
2	Back	Arm digging		
3	. ○ Left	Left swing		
4022-	Right	Right swing		

The diagonal movement of the control lever can realize two functions and can perform compound action.

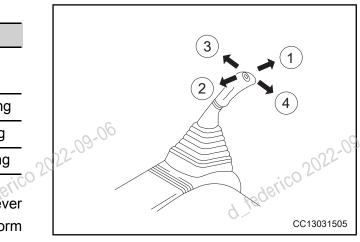


Fig.4-47

02022-09-06

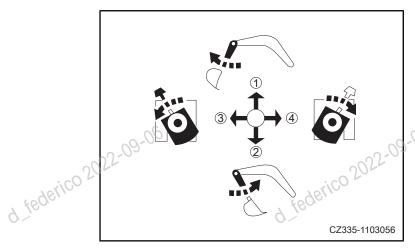


Fig.4-48



Right control lever

Action of the right control lever					
5	Front	Boom lowering			
6	Back	Boom lifting			
7	Left	Bucket digging			
8	Right	Bucket dumping			

 The diagonal movement of the control lever d. federico 2022: can realize two functions and can perform compound action.

NOTE:

- When the travel lever and control lever are in the neutral position, even if the fuel control knob is turned to the speed higher than the medium speed, if one of the travel levers is operated, the engine speed will rise to the speed set by the fuel control knob.
- If the control levers and joysticks are all at neutral position, the engine speed drops by approximately 100 rpm, and after approximately 3 seconds, it drops automatically to the set speed (approximately 1400 rpm).
- When the travel lever and the control lever are released, it will automatically return to the neutral position and the machine function will be disabled.

4.2.5 Skylight

WARNING

trol lever is in the unlocking position, accidental touching of the travel lever or can cause serio. · When leaving the driver's seat, the safety

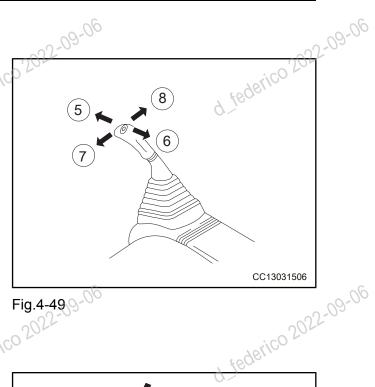


Fig.4-49

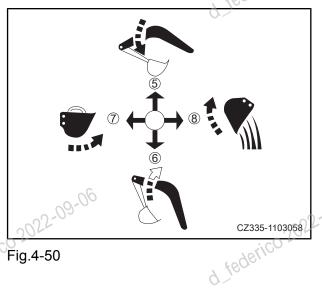
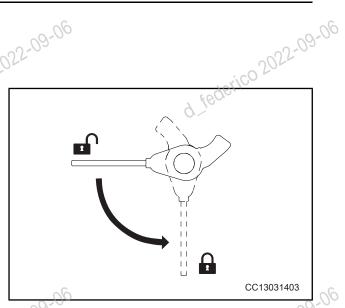


Fig.4-50

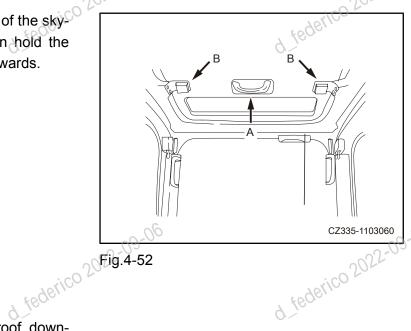


Turn the safety lock control lever to the "LOCK" position.



2022-09-06 Fig. 4-51

2. Push the locks [B] on both sides of the skylight handle [A] upwards and the light handle [A] upwards, and then hold the handle [A] and push the skylight upwards.



Closing
Hol Hold the handle [A] to pull the roof downwards, and the lock [B] will be automatically applied. If the lock can't be properly engaged, open the roof and try to lock it.

4.2.6 Windshield

- The front windshield can be retracted
- shield, stop the machine on the level ground, completely drop the work · Before opening or closing the front windground, completely drop the work equipment to the ground, stop the engine, and then operate it.



- mont windshield, hold mands and pull it upwards with both hands, and do not loosen hands until the automatic latch bolt is locked.

 When the front windshield, hold • When opening the front windshield, hold
- · When the front windshield is closed, the window will move quickly under its own deadweight. When it is closed, hold the handle with both hands.

WARNING

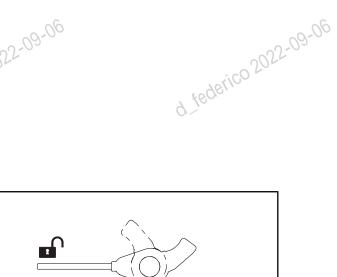
- Turn the safety lock control lever to the Jerico 2022-09-06 locking position when the front windshield, bottom window or door are opened or closed.
- If the safety lock control lever is in the unlocking position, accidental touching of the travel lever or control pedal can cause serious accident.

Opening

- 1. Stop the machine on a level ground, completely drop the work equipment to the ground, and then shut down the engine.
- 2. Turn the safety lock control lever to the "LOCK" position. d tederic







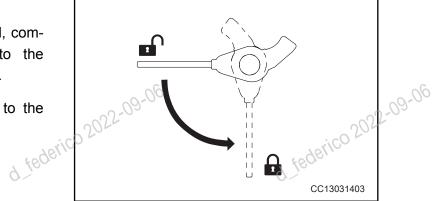


Fig.4-53

d. federico 2022-09-06

d. federico 2022-09-06

3. Check the wiper blade and place it in the right support. right support.

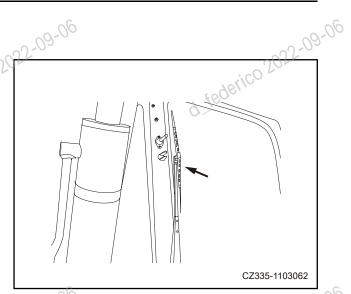


Fig.4-54

4. Hold the left and right handles [A] on the top of the front windshield and pull two handles IRI to release " dles [B] to release the lock on the top of the front windshield. The top of the front windshield will be released.

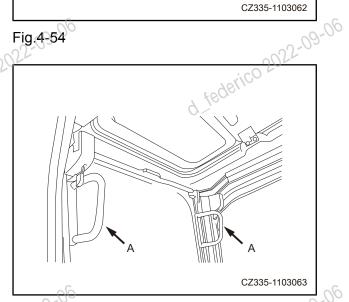
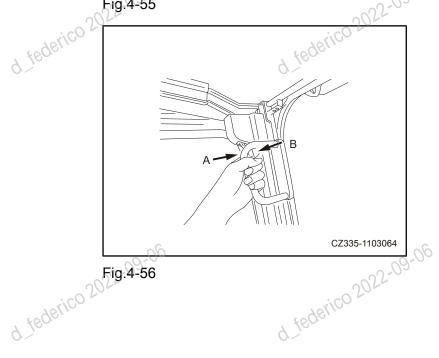


Fig.4-55



d. federico 2022-09-06

2-09-06 5. Hold the bottom handle [C] with left hand and the top handle [D] with right hand in the cab, to pull it upwards. In addition, push the latch bolt [E] towards the back of the cab to firmly lock the front windshield.

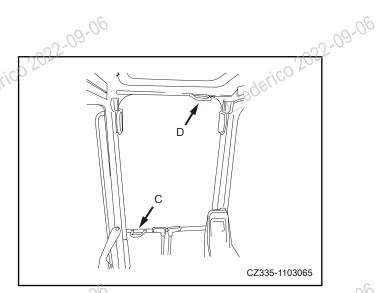


Fig.4-579

d federico 2022-09-06

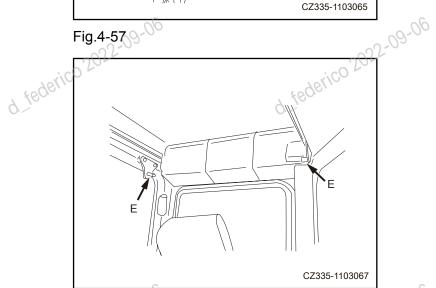
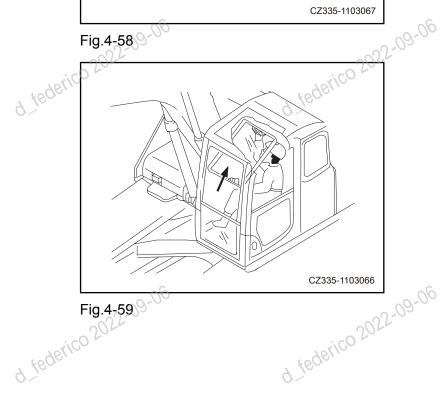


Fig.4-58

d. federico 2022-09-06



- 6. Check whether the handle [B] is secured at the "LOCK" position.
- Check whether the arrow on the lock shell [F] is aligned with the arrow on the handle [B], if yes, the lock will be engaged.
 - If the arrow on the lock shell [F] is not aligned with the arrow on the handle [B], the lock will not be engaged. Please repeat operations in the step 5 to engage the lock.

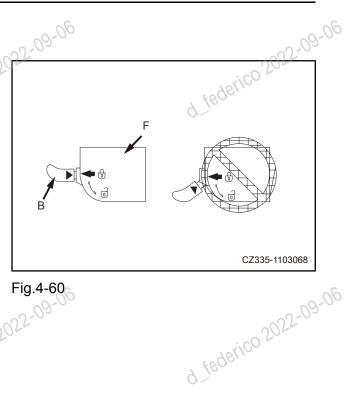


Fig.4-60 4erico 2022-09-1

Closing 22-09-06

CAUTION

- When closing the front windshield, slowly lower it down and be careful not to get stuck.
- 1. Stop the machine on a level ground, completely drop the work equipment to the ground, and then shut down the engine.
- 2. Turn the safety lock control lever to the "LOCK" position. d federico 201

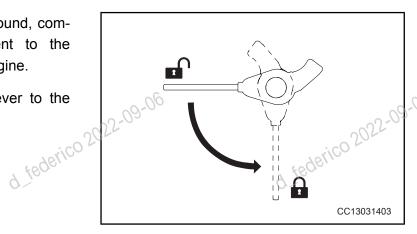


Fig.4-61

d_federico 2022-09-06

d. federico 2022-09-06

3. Hold the left and right handles [A] and pull the handle [B] downwards to release the lock.

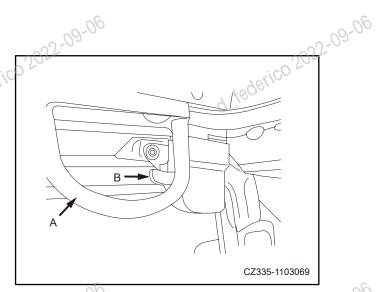


Fig.4-62

4. Hold the handle [C] at the bottom of the front windshield with left hand, hold the handle [D] on the top of the front windshield with right hand, to push it forwards, and then slowly lower it down.

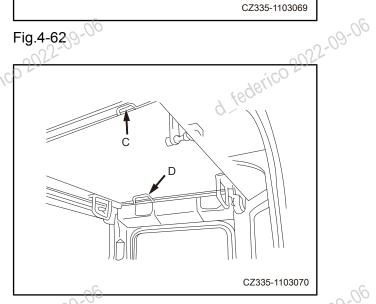
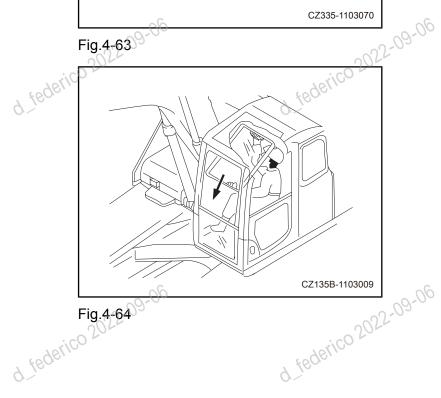


Fig.4-63



Operator Manul-June 2016

d. federico 2022-09-06

4-40

5. When the bottom of the front windshield reaches the top of the bottom window, push the top of the front windshield forwards to the left and right latch bolts [G] to engage the lock.

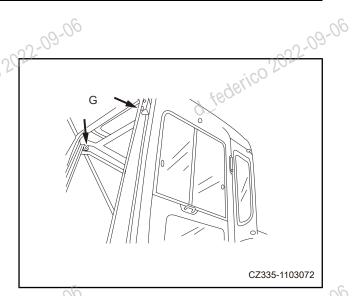


Fig.4-65

- 2022-09-06 6. Check whether the handle [B] is secured at the "LOCK" position.
 - Check whether the arrow on the lock shell [F] is aligned with the arrow on the handle [B], if yes, the lock will be engaged.
 - If the arrow on the lock shell [F] is not aligned with the arrow on the handle [B], the lock will not be engaged. Please repeat operations in the step 5 to engage the lock.

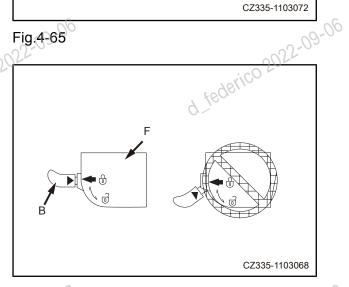
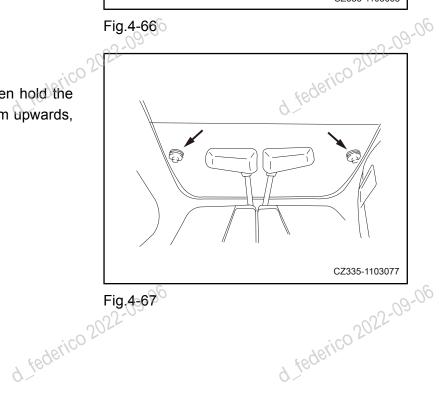


Fig.4-66

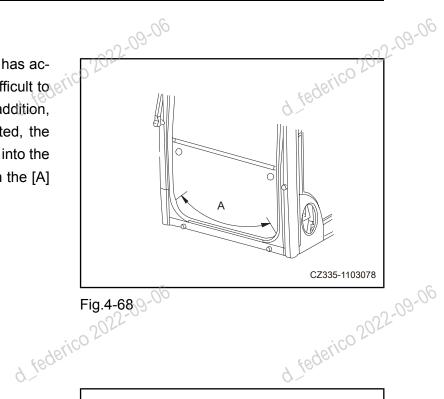
Remove the lower windshield

Open the front windshield, and then hold the left and right handles and pull them upwards, and remove the lower windshield.





 If the bottom of the front windshield has accumulated sand or dust, it will be difficult to remove the front windshield. In addition, when the front windshield is retracted, the sticky sand and dust will be brought into the cab. To prevent this condition, clean the [A] area before removal.



ico 2022-09-06 4.2.7 Cab door window

Opening

- 1. Press down the latch when opening the window of the cab door.
- 2. Slide the front windshield backwards and (or) slide the rear window forwards.

Closing

- 1. Slide the front windshield forwards and (or) slide the rear window backwards.
- 2. Close the door window and ensure that the latch is completely engaged.

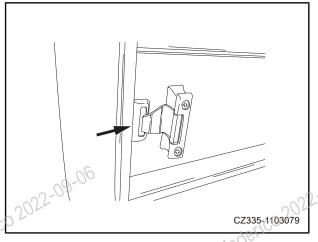


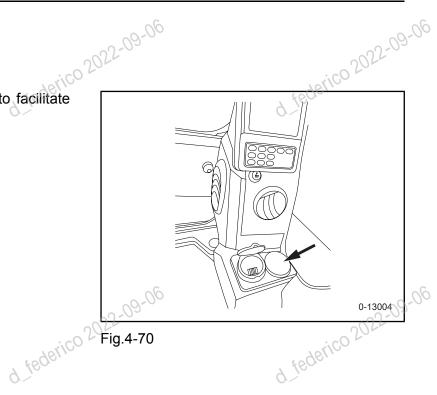
Fig.4-69





4.2.8 Cup holder

There is a cup holder in the cab to facilitate the driver to place cup (kettle).



d. federico 2022-09-06 4.2.9 Ashtray

- This ashtray is on the left of the cup holder.
- When cigarette is put in the ashtray, it shall be put out. Close the ashtray when it is placed in.



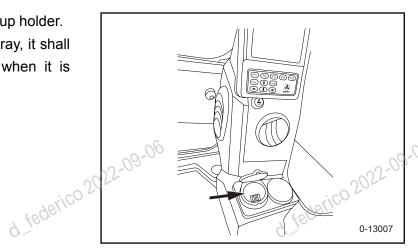
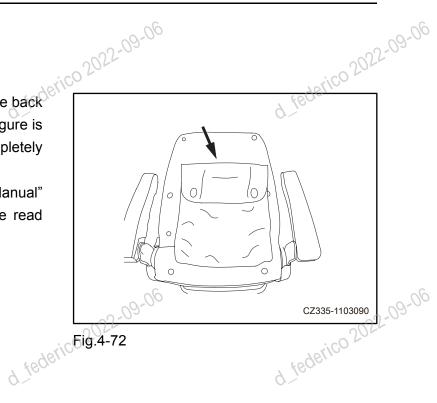


Fig.4-71

d federico 2022-09-06

d_federico 2022-09-06

- The information pack is located on the back of the driver's seat back. The right Fig. lowered down.
- The "Operation and Maintenance Manual" is placed in this pack, which can be read when necessary.



d_federico 2022-09-06 **4.2.11 Drink box**

- The drink box is located on the left side of the back of the driver's seat. It can keep the beverage warm and cool in the winter and summer.
- It can blow hot or cool air to the drink box Jetti. according to the setting of HVAC.

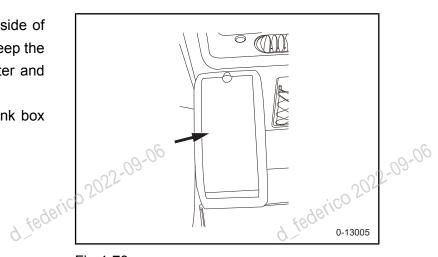


Fig.4-73

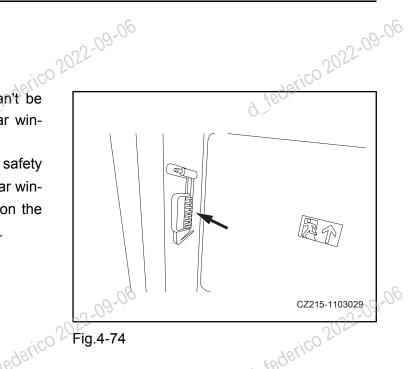
d_federico 2022-09-06

d_federico 2022-09-06

4.2.12 Emergency exit

If the door and window of the cab can't be opened in case of emergency, the rear window can be used as an emergency exit.

 For a cab with a safety hammer, the safety hammer can be used to break the rear window. The safety hammer is located on the left side of the rear window of the cab.



d.federico 2022-09-06 For the pull ring rear window, pull the pull ring, remove the rubber core from the window frame rubber, and then push the glass corner to remove the glass from the window.

NOTE:

Jar window The rear window can be used as an escape exit only in case of emergency. Do not use it

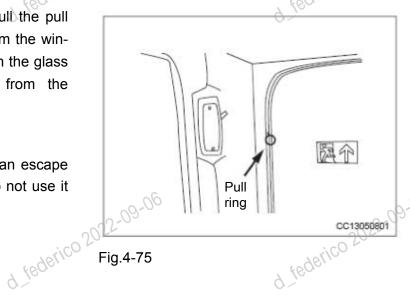


Fig.4-75

4.2.13 Fire Extinguisher

A CAUTION

- Be sure to prepare a fire extinguisher and read the label, and be familiar with the operation method in case of emergency.
- Regularly check the fire extinguisher and ensure that it is in the warranty period.
- If the fire extinguisher has expired, it shall be replaced timely.

The fire extinguisher shall be kept in the rear part of the cab.

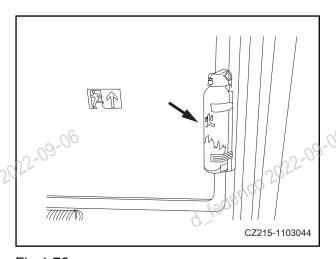
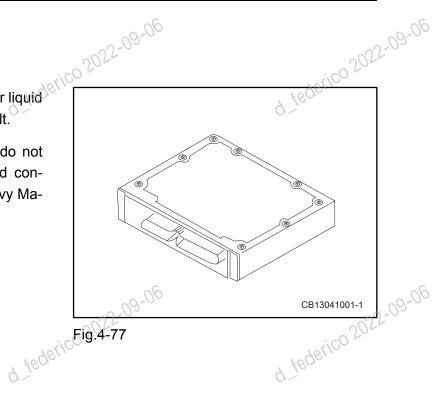


Fig.4-76

Be careful not to get water, mud or other liquid onto the controller. This will cause a fault

If the controller has any fault, please do not disassemble it without permission, and contact the authorized agent of SANY Heavy Machinery for repair.



federico 2022-09-06 4.2.15 Fuse link

When the starting switch is turned to the [ON] position, if the starting motor can't be started, the fuse link may have an open circuit. Open the fuse box cover at the back of the seat, and check and replace it.

NOTE:

- The fuse link (as shown in the Figure) refers to the fuse installed on the circuit to prevent burning electric parts and wires.
- The fuse link has specifications including 5 A, 10 A, 15 A and 20 A, which is distinguished with different colors. Replace the old fuse link with the one with the same capacity.
- Always turn the ignition switch to OFF position before replacing the fuse link.

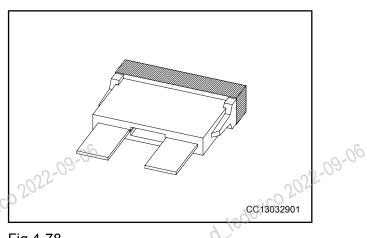


Fig.4-78



d.federico 2022-09-06

4.2.16 HVAC group

4.2.16.1 Control panel

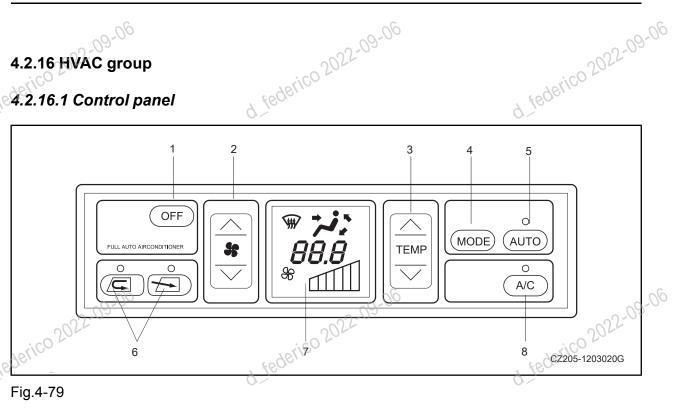


Fig.4-79

- [1] OFF switch
- [2] Fan speed setting switch
- [3] Temperature setting switch
- [4] Air vent mode setting switch

- [5] Automatic mode setting switch
- [6] Recirculation/ fresh air mode selector switch
- [7] LCD
- [8] A/C switch

4.2.16.2 Control switch and LCD

[1] OFF switch

This switch can be used to turn off fan and HVAC.

Press down the OFF switch [1], and indication of the setting temperature and air volume of the LCD will disappear, the upper lamp of the automatic mode switch [5] and the HVAC switch [8] will be off, and running will be stopped.

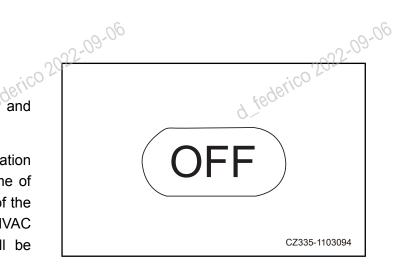
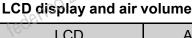


Fig.4-80 d. federico 2022-09-06



This switch is used to adjust the air volume and can set the air volume to six levels weak to strong. The played on the LCD.

- Press down the switch to increase the air volume.
- volume.
- The air volume will be automatically derico 2022-09-06 switched during operation under the automatic mode.



LCD	Air volume
*	Weak
*	Medium 1
*	Medium 2
*	Medium 3
*	Medium 4
*	Strong

.... switch is used to set the cab temperature. Temperature setting range: 18~32° C (64.4~89.6°F)

• Press down the ✓ switch to increase temperature.

- temperature.
- temperature.
- The operation temperature is generally 25° C (77°F).

LCD display and function

LOD display and function				
LCD	Set temperature	20-06		
18.0°C	Maximum cooling	2022-03		
18.5~31.5°C	Adjust the temperature to make the cab reach the set temperature	Jerico -		
32.0°C	Maximum heating			

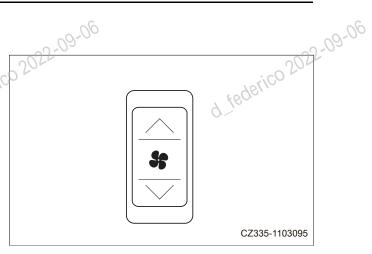


Fig.4-81

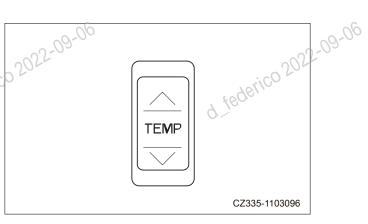


Fig.4-82



[4] Air vent mode setting switch

This switch can be used to select the air vent.

- Press down the switch [4], and the LCD display mode will be changed, and the air will be supplied from the air vent under the displayed mode.
- The air vent mode will be automatically switched under the automatic operation mode.

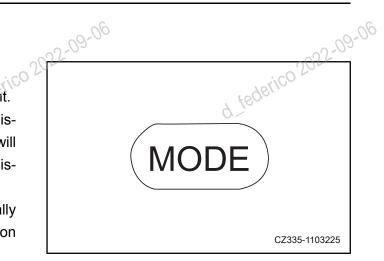


Fig.4-83

Description of air vent mode

					,	
Descripti	on of air vent mode			-02	-09-06	09.06
LCD	Air vent	Air vent				Remarks
		A	В	С	D	Remarks
**/	Front face air vent	0.>	0			It can't be selected under the automatic operation mode
\$ \$ \$	Front/back face air vent	0	0			
\$\hat{\range}{\range}^{\tilde{	Front/back face and foot air vent	0	0		0	
ζ) _a	Foot air vent				0	
₩ <i>β</i> 0	Foot and defrosting air vent			0	.09 <u>.</u> 06	It can't be selected under the automatic operation mode
	Defrosting air vent	Ç.	ederic	02022		It can't be selected under the automatic operation mode

NOTE:

Air will be supplied from the air vent marked with o.

Air vent of HVAC



d_federico 2022-09-06

[A]: Rear air vent: It is generally located at the back of the cab.

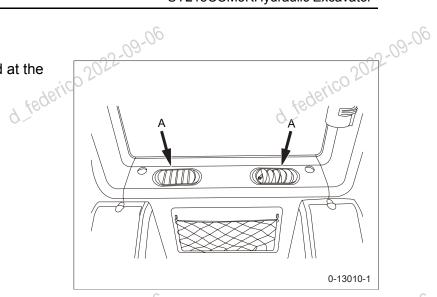


Fig.4-84

[B]: Face air vent

[C]. Defroster port

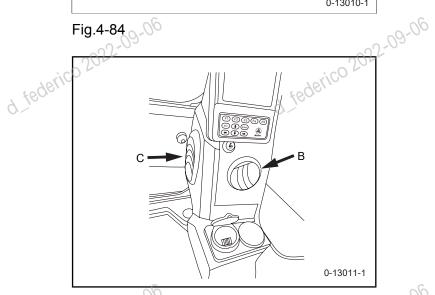
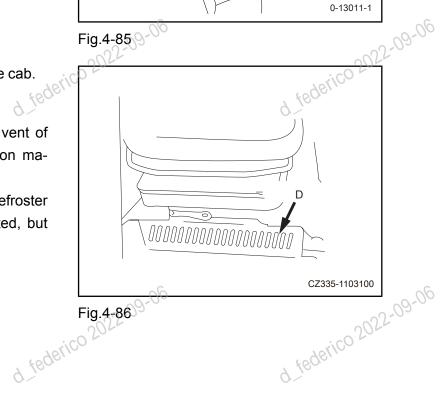


Fig.4-85

J22-09-06 [D]: Foot air vent: It is located below the cab.

NOTE:

- The appearance and quantity of air vent of HVAC may vary slightly depending on machine model.
- The direction of the face air vent, defroster port and rear air vent can be adjusted, but the foot air vent can't be adjusted.



[5] Automatic mode setting switch

This switch is used to automatically set the air volume, air vent and inside and outside air switching according to the set temperature.

- Press down the automatic mode setting switch [5], and the indicator lamp on the top of the switch will be on.
- Generally, press down this switch and set to the proper temperature with the temperature setting switch [3], and the HVAC will run automatically.
- When switching from automatic mode to manual mode, just reset the air volume, air vent and inside and outside air switching mode with the switches. In this case, the indicator lamp on the top of the switch will be off.

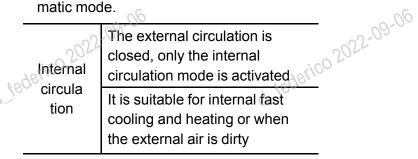


When the automatic mode is selected, if the temperature is set at 18°C (64.4°F) or 32°C (89.6°F) and the air flow remains at HIGH, this is not a fault.

[6] Recirculation/ fresh air mode selector switch

This switch is used to switch internal circulation and external circulation.

- Press down one of the switches [6], and the indicator lamp on the top of the switch will be on.
- The external circulation mode and the internal circulation mode will be automatically switched during operation under the automatic mode.



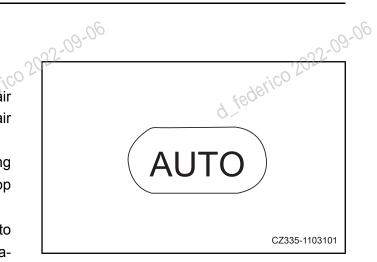


Fig.4-87

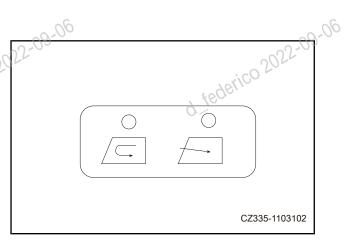


Fig.4-88

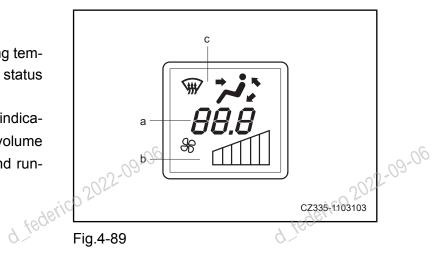


	30.00
External circula tion	A mode the external air is introduced into the inside
	It is suitable for clean air introduction and defogging

[7] LCD

The LCD [7] is used to display the setting temperature [a], air volume [b] and air vent status [c] during running.

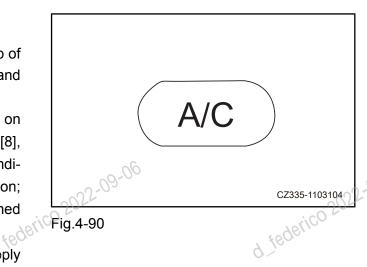
• Press down the OFF switch [1], and indication of the setting temperature, air volume and air vent status will disappear, and running will be stopped. on tederico



[8] A/C switch

This switch is used to control start and stop of actions (refrigeration, dehumidification and heating) of HVAC.

- When the fan is working ([b] is displayed on the LCD), press down the A/C switch [8], and the A/C will be turned on and the indicator on the top of the switch will be on; press it down again, the A/C will be turned off, and the indicator will be off.
- When the fan is turned off (no air supply status is displayed on the LCD), the HVAC can't be turned on.



4.2.16.3 Operation of A/C

The HVAC can be controlled automatically or manually. Select the control mode as required. d federico 2022-09-06





Automatic operation

1. Turn on the automatic mode setting switch AUTO o

In this case, the temperature [a] and air volume [b] will be displayed on the LCD, and the lamps on the top of the automatic switch @ and the A/C switch will be on.

2. Adjust the temperature setting switch to set the temperature as required.

Set the temperature accordingly, and the the air vent and the inside and outside air to provide the set temperature provide the set temperature.



When [d] or [e] status is displayed for the air vent mode [c] and the engine coolant temperature is low, the air volume will be automatically restricted to prevent blowing cool air.

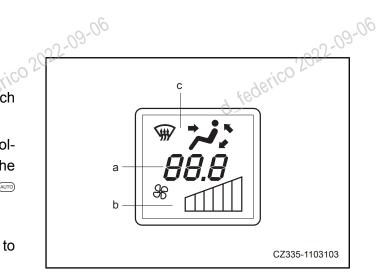


Fig.4-91

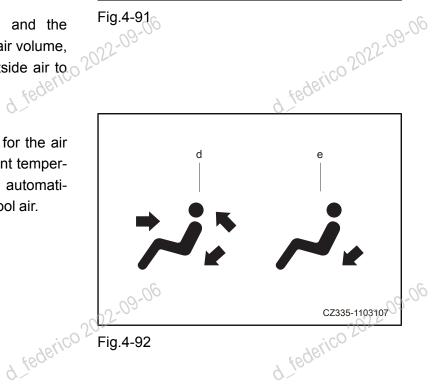


Fig.4-92

d. federico 2022-09-06 Stop automatic operation

Press down the switch of to stop automatic operation.

Manual operation

- 1. Press down the fan speed setting switch to adjust the air volume. In this case, check the temperature [a] and air volume [b] displayed on the LCD.
- 2 Turn on the A/C switch
- 3. Press down the temperature setting switch to set the cab temperature.

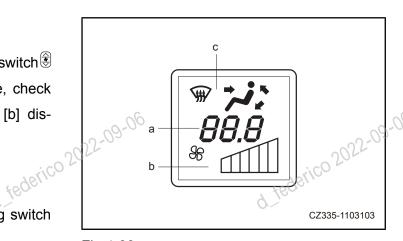


Fig.4-93



erico 2022-09-06

d_federico 2022-09-06

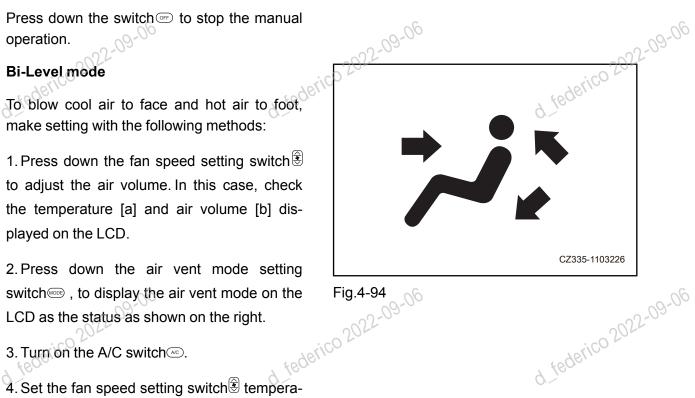
- 4. Press the air vent mode setting switch to set the mode as required. In this case, the display of the [c] on the LCD will be changed according to selections.
- 5. Press down the recirculation/ fresh air mode selector switch or to select the cab inside air recirculation or fresh air mode.

Stop manual operation

Press down the switch to stop the manual

- to adjust the air volume. In this case, check the temperature [a] and air volume [b] displayed on the LCD.
- 2. Press down the air vent mode setting switch , to display the air vent mode on the LCD as the status as shown on the right.
- 3. Turn on the A/C switch...
- 4. Set the fan speed setting switch temperature setting switch and recirculation/ fresh air mode selector switch @ or @ to the desired position.

Defrosting



d federico 2022-09-06

d. federico 2022-09-06

1. Press down the fan speed setting switch to adjust air volume. In this case, check at temperature 1.7 temperature [a] and air volume [b] displayed on the LCD.

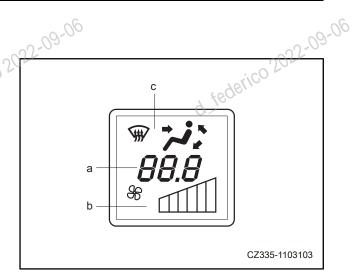


Fig.4-95

- 2. Press down the air vent mode setting switch , to display the air vent mode on the LCD as the [f] or [g] as shown on the right.
 - 3. Press down the recirculation/ fresh air mode selector switch @ or @ , to select the fresh air mode.
 - 4. Press down the temperature setting switch to set the temperature on the LCD to the hottest (32°C).
 - fogging or dehumidification of the window, turn on the A/C switch · During operation in the rainy season or de-18 deturn dehumidification.



Fig.4-96

d_federico 2022-09-06

d. federico 2022-09-06

- When operating HVAC, be sure to start it when the engine is running at low or Do not turn on the line. is running at high speed. Otherwise, it will cause HVAC fault.
- If the water enters the control panel or the daylight sensor, it will cause an accident fault. Be careful not to get water on these parts. In addition, do not make open fire close to these parts.
- For normal operation of automatic function of the HVAC, be sure to keep the daylight sensor clean, and do not place anything around the daylight sensor, otherwise it will affect the function of the sensor.

d. federico 2022-09-06 d federico 2022-09-06

Fig.4-97

NOTE:

The arrow in Fig. 4-98 indicates the location of the daylight sensor.

Ventilation

- federico 2022-09-06 When the HVAC is running for a long time, the "Inside and Outside Air Mode" shall be changed to the "Outside Air Guidance" mode every 1 h for ventilation.
- In case of smoking when the HVAC is turned on, the smoke will hurt your eyes, therefore, the "Inside and Outside Air Mode" shall be changed to the "Outside Air Guidance" mode to ensure that smoke can be removed in continuous cooling.

Temperature control

than that when entering the cab. The temperature difference is considered to he most suitable for hear. When the A/C works, set the temperature at





- Inspection and maintenance of machine with HVAC

 The inspection and maintenance of machine with HVAC shall be correct. cording to charts. For details, see the "Inspection and Maintenance of HVAC" on page 5-32.
 - When the HVAC is not used for a long time, it is necessary to operate the engine at a low speed to prevent the loss of the oil film on each part, and perform refrigeration, de-
 - If the cab temperature is lower than the outdoor temperature, the HVAC will according to the second secon heat up the cab, and the HVAC will work when the HVAC switch is turned on again.
 - If any device or sensor on the HVAC has any fault, please contact the authorized agent of SANY Heavy Machinery for inspection and repair. d. federico 2022-09-06

4.2.17 Radio

4.2.17.1 Control panel

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

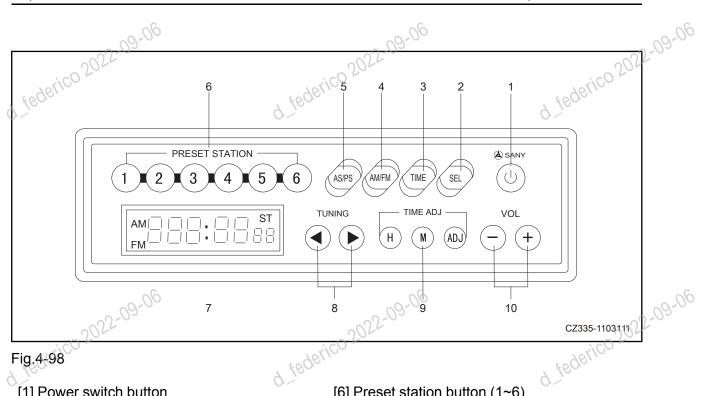


Fig.4-98

- [1] Power switch button
- [2] Audio conversion button
- [3] Time display button
- [4] FM / AM conversion button
- [5] AS/PS button

- [6] Preset station button (1~6)
- [7] LCD
- [8] Tuning button
- [9] Time adjustment button
- [10] Volume adjustment key

4.2.17.2 Control button and LCD

[1] Power switch key

2022-09-06 Press down the power switch to power on the radio. The frequency will be displayed on the display [7]. Press down this switch again to power it off.

[2] Audio conversion key

Each time the audio conversion button is pressed, the audio status will be displayed as follows: VOL→BAS →TRE→BAL.

The host will return to the frequency display interface if there is no operation within 5 s.

The audio status will be displayed on the display [7].

[3] Time display key

Press down the time display button , and the current time will be displayed for 5 s. The display will automatically recover to the frequency display 5 s later.

If pressing down and holding the key [3] for more than 5 s, the national area: ASA: EU (Asia: Eud federico 21 d federico rope) will be displayed.

[4] FM/AM conversion button

Press down the FM/AM conversion button to select the required band. After this key is pressed down each time, the band will be switched between FM→AM→FM.

[5] AS/PS (automatic search and preset station) button

The function of the AS/PS key is to: Automatically search and save the station and browse and play the preset station.

Automatically search and save the station:

In the audio mode, press down the AS/PS button to scan preset stations in turn. Each preset station will remain for 10 s, and the characters of the scannedpreset position will flash on the display. If you need to listen to a station, press down again to stay at this station.

Browse and play the preset station:

In the radio mode, press down the AS/PS key and wait for more than 2 s. The system will begin to automatically search stations at current band, save 6 stations with the strongest signal in memories 1-6 in order, and finally lock the station and begin playing.

[6] Preset station key

If the preset station keys (1~6) are used to determine which stations are preset, you can select the d federico 2022 d federico 2022 required station with the key.

[7] LCD

The receiving band, frequency, preset number and time will be displayed on the display.

[8] Tuning key (TUNING)

Press down the tuning buttons @and o to change frequency.

• button: frequency goes down

• button: frequency goes up

d federico 2022-09-06 [9] Time adjustment key (TIME ADJ)

Press[®], ®and[®] to adjust time.

® H:hours

M: minutes

@ ADJ: set as 00

[10] Volume adjustment key (VOL)

d_federico 2022-09-06 Press down the keys in the keys to increase the volume in turn to 40.

Press down the ○ key to reduce the volume in turn to 0.

It will return to the frequency display interface if there is no operation within 5 s.

4.2.17.3 Radio operation

Method of setting with preset key

- 1. Press down the power switch [1]. In this case, the frequency will be displayed on the display [7].
- 2. Select the required frequency with the upward and downward search button [8]. There are two tuning methods including automatic tuning and manual tuning.
- 3. When the required frequency is displayed on the display [7], the received sound will disthe preset the preset number and frequency will be displayed on the display to indicate that the preset operation has been completed. When the preset is completed, press down the radio preset station key [6] and release it within 1.5 s, so as to receive the preset band of the key.

NOTE:

d. federico 2022-09-06 The automatic storage key can be used to save it to the preset key.

Station search method

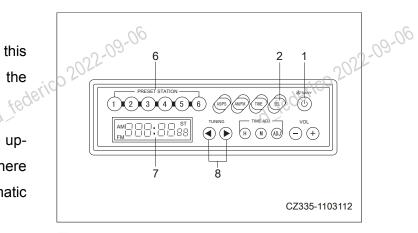


Fig.4-99



- case, the frequency will be displayed on the display [7]. display [7].
 - 2. Select the required frequency with the tuning button [8]. There are two tuning methods including automatic tuning and manual tuning.
 - Manual tuning Press down the tuning key [8] until the frequency is displayed on the display [7]. When the frequency reaches the top or botico 2022-09-06 tom frequency, it will automatically continue in the order of top→bottom or bottom→top.
- Automatic tuning Press down and hold the tuning key [8] to automatically search the station up or down. When a station is received, the tuning will stop automatically. In order to search for the next station, just press down and hold the tuning key [8].

If this key is pressed down during the automatic tuning, the automatic tuning function will be canceled. Then the frequency used Mederico 2022-09-06 before this key is pressed down will be restored.

Audio adjustment

- Volume adjustment (VOL): Press down the button to increase the volume gradually to 40; press down the button

 o to reduce the volume gradually to 0;
 - Bass adjustment (BAS): Firstly press down the button to switch the audio to the BAS mode, and then press down the button⊕ or within 5 s to change the bass loudness
 - down the button to switch the audio to • Treble adjustment (TRE): Firstly press the TRE mode, and then press down the button⊕ or o within 5 s to change the treble loudness within the range of +7~-7.

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

• Balance adjustment (BAL): Firstly press down the button to switch the audio to the BAL mode, and then press down the button⊕ or owithin 5 s to change balance of the left and right sound tracks within the range of L9-R9. BAL.0 represents balance between left and right sound tracks.

NOTE:

For all modes, if there is no operation within 5 s, the LED will be automatically recovered to the original setting.

Time setting

- 1. Press the time display button [3] to display the time. After 5 seconds, the display will return to the frequency display and the time cannot be corrected. In that case, press the TIME button [3] again.
- 2. Press the time adjustment button [9] to set hours or minutes.

Key[⊕] :Adjust hours.

ress this key once to increase 1 minute).

Press and hold the button or to increase hours or minutes continuously.

button: Preset time 5

- When "00-05" minutes are shown, press the key to set the time as 00 minute and 00 second. (The hours do not change)
- When "55-59" minutes are shown, press the key to set the time as 00 minute and 00 second. (One hour is added)
- d. federico 2022-09-06 When "06-54" minutes are shown, the time cannot be preset. (The time remains unchanged)

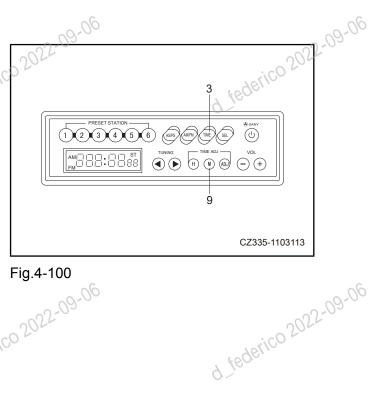


Fig.4-100

3rico 2022-09-06



Antenna 22-09-06

Before moving the machine to the inside of the building, the antenna shall be retracted to prevent any interference. Retract the antenna as follows:

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

Use the radio carefully

- In order to ensure safety, the volume shall be kept at the level where the external noise can be heard during operation.
 - If water flows into the loudspeaker box or radio, it will cause an accident, so be careful not to get the water on the device.
 - Do not use benzene, diluent or other solvent to wipe off the control panel or key. Wipe it off with a piece of soft cloth. If the device is too dirty, wipe it off with a piece of
- placed, the setting of the preset key and the clock will be cleared, so all settings When the battery is disconnected or reclock will be cleared, so all settings shall be reset.

4.2.18 Door lock

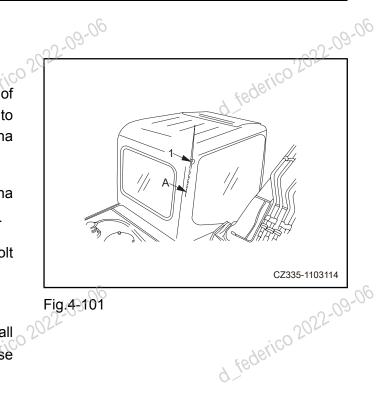


Fig.4-101





d federico 2022-09-06

- Stop the machine on the level ground before releasing the door lock.
 Do not release "
- The door may be closed suddenly and damaged.
- Do not extend your body or hand out of the door before you release the door lock. Do not put your hand on the door frame. The door may be suddenly closed and damaged.
- 1. Push the cab door towards the latch bolt [1] to lock it
- 2. When closing the door, press down the handle [2] on the left side of the driver's seat to loosen the latch bolt [1].

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

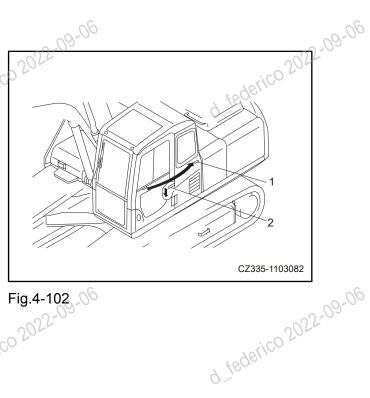


Fig.4-102 d federico 2022-1

.02022-09-06 4.2.19 Cap with lock

4.2.19.1 General

Lock and unlock the cap and cover with the ignition switch key. For details of the lock cap and cover, see the "Locking" on page 4-105.

Insert the key to the shoulder [A].

NOTE:

Turning the key when it is not inserted at the bottom may cause breakage. d federico 21

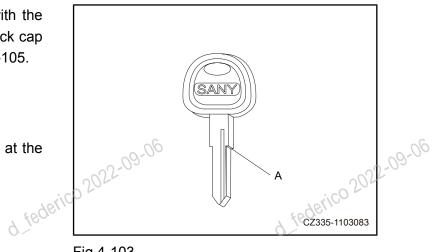


Fig.4-103

d_federico 2022-09-06

4.2.19.2 Opening and closing the cap with lock

A CAUTION

- After removing the key, be sure to rotate the cap [1] to cover the keyhole. Otherwise, foreign matters in the cap lock will make the switch inflexible or even disabled.
- When the cap with lock is tightened, the stroke is larger. Ensure that the cap with lock is rotated properly, and then turn the key to lock the cap. If the key is removed when the cap is not rotated in place, the latch bolt will touch the inner wall of the filler to damage the lock cylinder.
- It is necessary to ensure the cleanness of the sealing ring in the cap with lock. If the sealing ring is stained with impurities including iron chips and stones, it will be easily damaged during tightening, causing improper sealing of the cap.

Open the cap

- 1. Unscrew the keyhole cap [1].
- 2. Insert the key into the key slot.
 - 3. Rotate the key clockwise to align the key slot with the mark [A] on the cap, and then open the cap [2].

Position [A]: Open

Position [B]: Locked

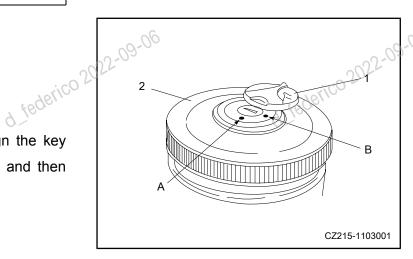


Fig.4-104







- 2. Rotate the ignition switch key to the "LOCK" position [B], and remove the key.
- 3. Rotate the cap [1] to cover the keyhole.

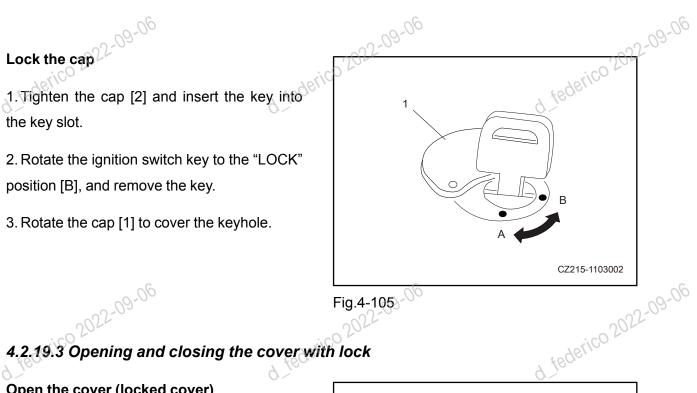


Fig.4-105

4.2.19.3 Opening and closing the cover with lock

Open the cover (locked cover)

- 1. Insert the key into the key slot.
- 2. Rotate the key counterclockwise and open the cover through its handle.

Position [A]: Open

Position [B]: Locked

Lock the cover

- 1. Close the cover, and insert the key into the key slot.
- 2. Rotate the key clockwise and remove it.

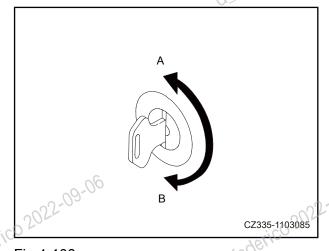


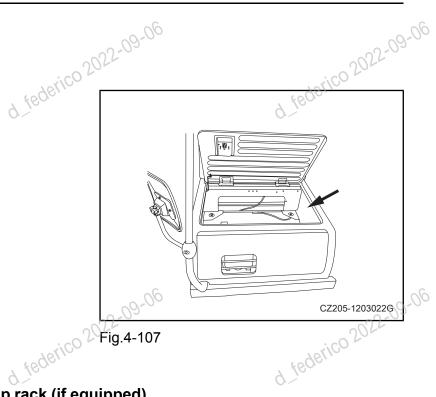
Fig.4-106





4.2.20 Tool box

It is used to store tools.



d federico 2022-09-06 4.2.21 Lubricating grease pump rack (if equipped)

The lubricating grease pump rack is installed in the access door at the left rear part of the machine. Hook the lubricating grease pump on this rack when it is not used.

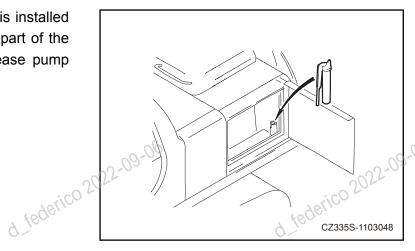


Fig.4-108

4.3 Operation and control of machine

4.3.1 Before engine start

d federico 2022-09-06

4.3.1.1 Walkaround inspection

Before starting the engine, check the machine and the part below it. Check whether bolts or nuts are loose, whether there is oil, fuel or coolant leakage, and check conditions of the work equipment and hydraulic system. In addition, check whether the wires near the high temperature area are loose, and there are clearance and dust accumulation.

CAUTION

- Remove the combustible materials around the battery, engine, muffler, turbocharger or other high temperature parts, otherwise, it may cause fire.
- The leakage of fuel or oil will cause the machine burning.

The following inspection and cleaning shall be performed before starting the engine every day:

- 1. Check whether the work equipment, cylinder, hose, etc. have cracks, excessive wear or looseness, and whether the O-ring at the connection between bucket and arm is damaged. If any problem is discovered, carry out repair orreplacement.
- 2. Remove the dirt and debris around the engine, battery and radiator.

Check whether there are dirts around the engine and radiator. In addition, check whether there are combustible materials (dry leaves, twigs, etc.) around the battery, engine muffler, turbocharger, or other high temperature parts. If dirts or combustibles are discovered, remove them.

For a method to remove dirt from the radiator, see the "Cleaning and Inspection of the Radiator and Cooler Fins" on page 5-55.

- 3. Check for leakage of coolant and oil around the engine. Check whether the engine has oil leakage and the cooling system has coolant leakage. If any problem is discovered, repair it.
- 4. Check whether the hydraulic device, hydraulic tank, hose and adapter have oil leakage. Check for oil leakage. If any problem is discovered, repair the leaky oil part.
- 5. Check whether the carrier (track, sprocket, guide wheel, guard board) is damaged and worn,
- 6. Check whether the armrests and ladder are defective, and whether bolts are loose. If any problem is discovered, repair it. Tighten loose bolts.
- 7. Check whether the instrument and monitor are defective. Check whether the instrument and monitor inside the cab aredefective.

If any problem is discovered, replace the parts. Remove dirts from the surface.

8. Clean and check the rearview mirror.

Check whether the rearview mirror is damaged. If damaged, repair it. Clean the surface of the mirror and adjust the angle, so as to ensure that the rear area can be seen while sitting on the driver's seat.

Check whether the seat belt and fixing clamp are damaged or worn. If damaged, replace the part with a new one. federico 21

10. Check whether the bucket with hook (if equipped) is damaged.

Check whether the hook, guide plate, and hook seat are damaged. If any fault is discovered, please contact the authorized agent of SANY Heavy Machinery for repair.

4.3.1.2 Inspection before start

ico 2022-09-06 Always check the items in this section before starting the engine every day.

Drain water and sediment from the fuel tank.

- 1. Open the access door on the right side of the machine.
- 2. Place a container at the outlet of the drain hose [1] to hold discharged fuel.
- 3. Open the drain valve [2] to make all sediments and water accumulated at the bottom flow out with the fuel.
 - 4. Close the drain valve [2] when there is a clean fuel flow.
 - 5. Close the access door.

Check and drain out water and sediment in water separator

- 1. Open the access door on the right side of the machine. (The primary fuel filter [2] has the feature of water separation.)
 - 2. Observe the condition through the water collectors on the transparent housing to judge the water level and the amount of sediment. If there is water or sediment accumulation at the bottom, unscrew the drain valve to drain out water.
- d_federico 2022-09-06 3. Tighten the drain valve immediately when the fuel begins to flow from the drain hose. d federico

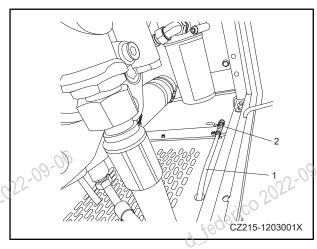


Fig.4-109

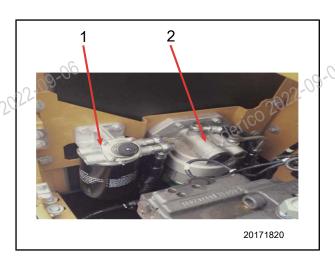


Fig.4-110





If the water in the water collectors [2] and [6] freezes in winter, after the engine is starting as the temporary NOTE: 1022-09-06 freezes in winter, after the engine is started, as the temperature around the fuel pre-filter [1] and the water separator [5] rises so that the frozen water is completely dissolved, drain the water according to the above steps.

WARNING

- Unlike a mechanical engine, the fuel injecunusually obvious, so be sure to check the drainage before starting the engine tion pump of an electronically controlled
- If the water collectors [2] and [6] are dirty or it is difficult to see the inside, clean the transparent housing when replacing the filter element.

Adjustment of the drain valve of the primary fuel filter:

If the drain valve [3] is not flexible, apply grease to the O-ring portion of the valve to achieve smooth movement.

- ? Open the access door on the right side of the machine and turn the shut-off valve [F] in the fuel line to the "CLOSE" position.
- Place a container under the additional fuel filter to hold the fuel.
- Unscrew the drain valve [3], and then drain all water and sediment in the water collector [2] and the fuel accumulated in the filter element [1].
- Apply an appropriate amount of grease to the O-ring [3]. At this time, be careful stick the greas the O-ring [3]. At this time, be careful not to or the drain valve thread B.



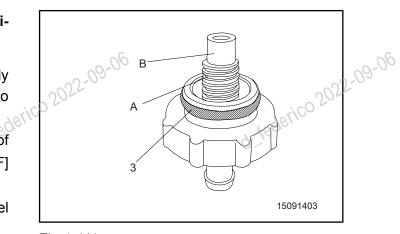


Fig.4-111



- comes into contact with the bottom of the water collector [2]. • Tighten the drain valve [3] by hand until it water collector [2].
 - Remove the fuel container.
 - Turn the shut-off valve [F] in the fuel line to the "OPEN" position.

Check oil level of the hydraulic tank

WARNING

- When the engine is stopped, the parts and oil are still very hot, which may cause scalding Start operation after they are cooled down.
- When the filler cap is removed, slowly rotate it to --' tate it to release the internal pressure and then remove it.
 - 1. Adjust the work equipment to the position as shown on the right, and then shut down the engine.
 - 2. Move the work equipment control lever and travel lever in all directions for the full travel within 15 s after the engine is stopped to release the internal pressure.
 - 3. Open the access door on the right side of the machine to check the oil lever gauge [G]. When the engine is cold: (oil temperature of 10~30°C or 50~86°F)

L+12.5~L+32.5

When the engine is warm: (oil temperature of 55~80°C or 131~176°F)

When the engine is warm: above the middle scale

- rico 2022-09-06 4. If the oil level is lower than the L line, add oil through the filler [F] on the top of the tank.
- Caltex anti-wear hydraulic oil HDZ46 (B420106000036) is recommended.
 - Capacity of hydraulic tank: 380 L

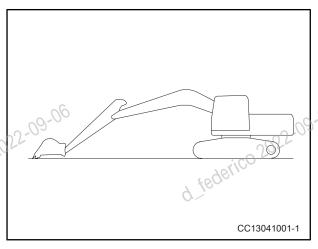


Fig.4-112

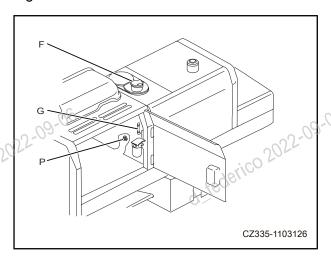


Fig.4-113

F: filler G : oil lever gauge

P: drain plug

NOTE: 2022-09-06 Stop oil filling when it reaches the H line. This will damage the hydraulic device and cause oil spraying. If oil level is higher than the H line, stop the engine. After oil is cooled down, place an oil container below the drain plug [P] at the bottom of the hydraulic tank, and then drain the excessive oil from the drain plug.

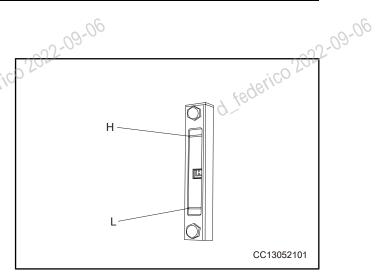


Fig.4-114

Check the coolant level

WARNING

- After the engine is stopped, the coolant will be very hot and the radiator will have a high pressure status. If the radiator cap [1] is removed and the coolant level is checked at this time, there will be a scalding hazard. Therefore, remove the cap [1] after it is cooled down. After that, slowly rotate the cap to release the internal pressure.
- 1. When the engine is working, the coolant level shall be located between the user lower limit marks of the radiator. If the cooling water level is lower than the lower limit, the radiator and the auxiliary water tank shall be filled with coolant.

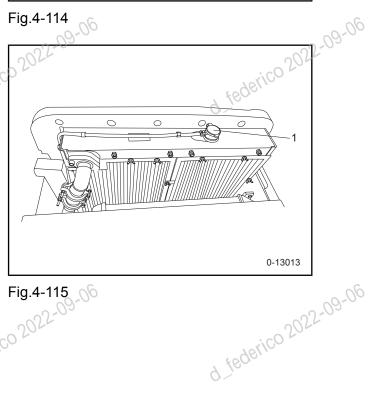


Fig.4-115

d federico 2022-09-06

d. federico 2022-09-06

- 2. Open the door on the left rear side of the machine to check whether the coolant in the expansion. expansion tank [2] is between FULL and LOW marks. If the coolant level is low, the coolant shall be filled to FULL liquid level through the filler of the auxiliary water tank [2].
 - 3. Tighten the cap after adding the coolant.
 - 4. If the expansion tank [2] is empty, there may be a leakage of coolant. After inspection, repair it immediately. If there is no problem, check the coolant level in the radiator. If the coolant level is low, fill the coolant to the auxiliary water tank [2].
- 5. If the expansion tank [2] is very dirty and the liquid level can't be seen, refer to the "Changing the engine coolant and cleaning the inside of cooling system" on Page 5-74.

Check oil level of engine oil pan

WARNING

- When the engine is stopped, the parts and oil are still very hot, which may cause scalding Relevant operation can be carried out after they are cooled down.
- 1. Open the engine hood.
 - 2. Remove the oil dipstick [G] and wipe off oil on it with a piece of cloth.
 - 3. Insert the oil dipstick [G] completely and then remove it.

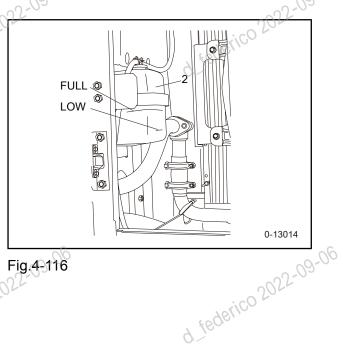


Fig.4-116

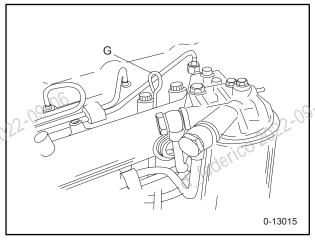


Fig.4-117



d. federico 2022-09-06

1-09-06 4. The oil level shall be located between the H and L marks on the oil dipstick [G].

If the oil level is lower than the L mark, fill oil through the filler [F].

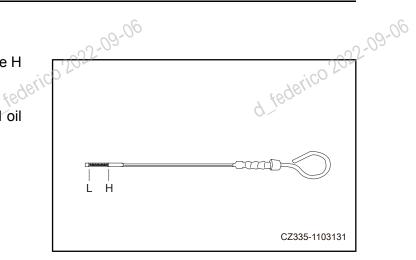


Fig.4-118

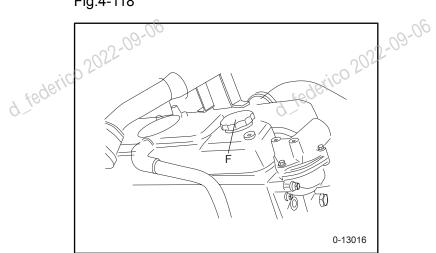
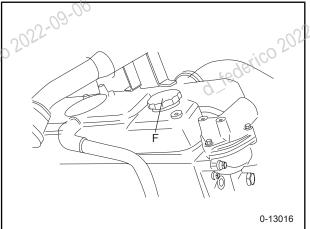


Fig.4-119



- 5. If the oil level is higher than the H line, open the drain valve [P] at the bottom of the engine oil pan, drain the excessive oil, and then check the oil level again.
- 6. If the oil level is proper, tighten the filler cap firmly and close the engine hood.

NOTE:

- Before checking oil level after engine operation, wait at least 15 minutes after the engine stop.
- d federico 2022-09-06 Keep the machine level before inspection.

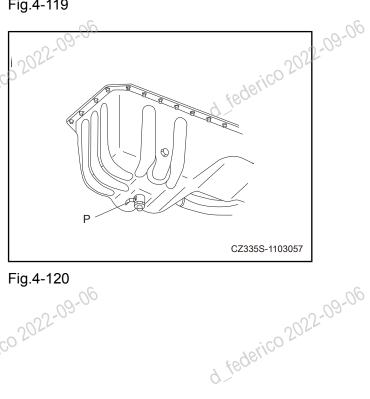


Fig.4-120

Check wires

CAUTION

- 02022-09-06 If the fuse has been burnt frequently or if there is a short circuit in the wire, please contact the authorized agent of SANY Heavy Machinery to find the cause and repair it.
 - Keep the upper surface of the battery clean, and check the air vent on the battery cap. If the battery cap is blocked by dirt or dust, flush it to clean the air vent.

the specified capacity fuse is used, whether the wire has trace of open circuit or short cuit, or whether the cable cladding is damaged.

Check whether the terminal is loose. If loose, tighten them.

In addition, pay special attention to wires when checking batteries, motors, starting motors and alternators. Be sure to check whether d federico 2022-09-06 there is a flammable accumulation around the battery. If flammable material is discovered, remove it immediately.

Check the fuel level

WARNING

- When filling fuel, do not spill or overflow the fuel. This will cause a fire.
- Fuel is flammable. Do not make open fire close to fuel.
- If the fuel is spilled, clean it thoroughly. If the fuel flows to the ground or sand, red.federico 2022-09-06 d federico 2022-09 move it.

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

2-09-06 1. Turn the ignition switch to the [ON] position, and check the fuel level indicated on the display. After inspection, turn the switch back to [OFF] position.

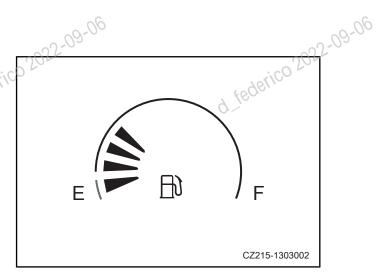


Fig.4-121

- 2. In the case of low fuel level, unscrew the filler cap [F] on the fuel tank, and add the fuel through the filler until the float of the float level meter [G] reaches the highest point.
- Capacity of fuel tank: 340L
- When the fuel tank is filled up, the top [a] position of the float level meter [G] is about 50 mm
- When the fuel amount is less than 10%, the display will send an alarm.
- 3. Add the fuel, press down the float level meter [G] in a straight line through the filler cap [F], taking care not to clamp it to the boss of the filler cap [F], and then tighten the filler cap [F].

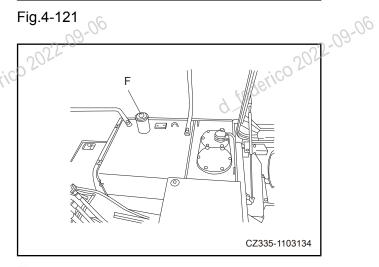
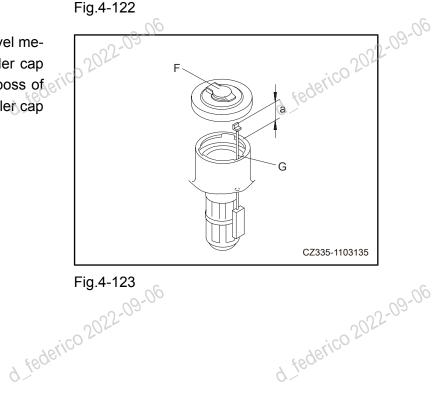


Fig.4-122



d federico 2022-09-06

- If the air vent (as arrowed in Fig. 4-126) on the cap is blocked, the pressure in the will drop and the NOTE 222-09-06 air vent frequently.
- When the lock cap is tightened, the stroke is larger. Ensure that the lock cap is rotated properly, and then turn the key to lock the lock cap. If the key is removed when rotation is not completed, the latch bolt will touch on the inner wall of the filler to damage the lock cylinder.
- It is necessary to ensure the cleanness of the sealing ring in the lock cap. If the sealing ring is stained with impurities including iron chips and stones, it will be easily damaged during tightening, causing improper sealing of the lock cap.

Check the working lamp switch

Check whether the working lamp can be normally turned on.

Check for dirt or damage.

If the lamp can't be turned on, the bulb may be burnt out or broken, please contact the authorized agent of SANY Heavy Machinery for repair.

- 1. Turn the ignition switch to the [ON] position.
- 2. Turn on the working lamp switch to check whether the working lamp is turned on.

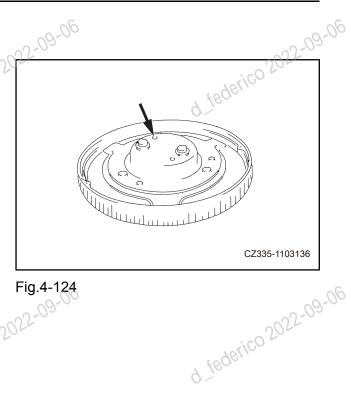


Fig.4-124

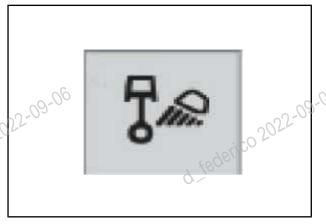
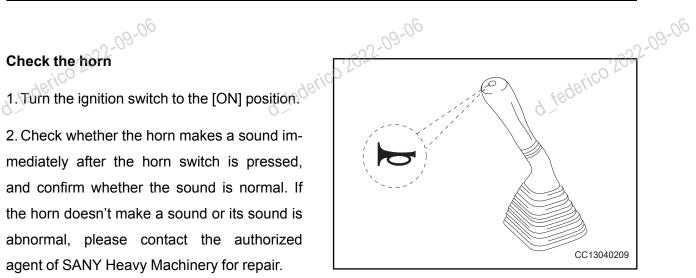


Fig.4-125



d federico 2022-09-06

- mediately after the horn switch is pressed, and confirm whether the sound is normal. If the horn doesn't make a sound or its sound is abnormal, please contact the authorized agent of SANY Heavy Machinery for repair.



4.3.1.3 Adjustment before operation

Driver's seat

Before starting operation or after changing the driver, adjust the seat position to ensure that the driver can operate the travel lever, pedal and switch freely and easily when sitting in the seat.

[A] Depth adjustment of seat

Pull up the pull rod [1] to move the seat to the required position, and then release it.

Adjustment distance: 200 mm (10 mm per grade)

[B] Overall dept adjustment of seat

Pull up the pull rod [2] to adjust it to the required position, and then release it. In this case, the driver's seat, left and right armrest boxes and the pilot lock rod will slide together.

[C] Adjustment of suspension (if equipped)

right, and the suspension will become softer to suit the lighter driver. to suit the lighter driver.

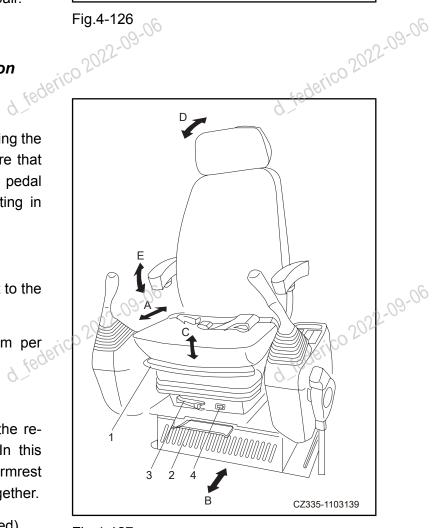


Fig.4-127

In order to achieve the best adjustment, adjust the reading (kg) of dial [4] to the position to the NOTE, 022-09-06 the reading (kg) of dial [4] to the position corresponding to the driver's weight.

[D] Adjustment of rear seatback

Pull up the handle [5], place the seatback back to the best position for easy operation, and then release the handle.

NOTE:

When adjusting the inclination of the seatback, be careful not to interfere with the rear A/C cover panel, and take care not to make the handrail touch the operation lever.

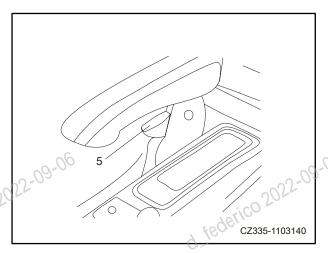


Fig.4-128

[E] Adjustment of handrail angle

Rotate the adjustment dial [7] at the bottom of the armrest [6] to adjust the angle of the handrail to the required position.

Lift the armrest to the vertical position to ensure that the driver can leave the seat.

Armrest adjustment angle range: 40° d federico

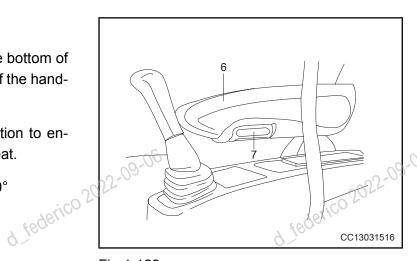


Fig.4-129

Rearview mirror

WARNING

 Be sure to adjust the rearview mirror before start. If no correct adjustment is made, the sight line can't be guaranteed, and personal injury may be caused.

The installation position of the rearview mirror is as shown in the Figure.

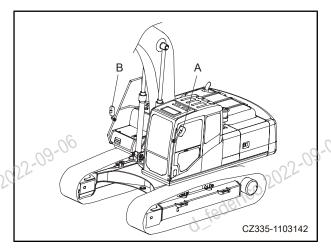


Fig.4-130

Rearview mirror [A]

Adjust installation of the rearview mirror [A] to ensure the personnel at the left rear side of the machine can be seen.

- Install the rearview mirror [A] in the position as shown in the right Figure.
- Rotate the fixing rod [1] around the grab bar to a proper position, and fix the fixing rod [1].
- If the mirror can't move smoothly when adjusting the angle, release the fixing bolt [2] J.4-1 Jederico 2022 and the fastening lever bolt [3] of mirror. Tightening torque of bolt [2]x: 4.0~5.4 N·m (0.41~0.55kgf·m)
- When adjusting the angle of the rearview mirror, the sight line entering the mirror on the side of the machine shall prevail, as shown in the right Figure.

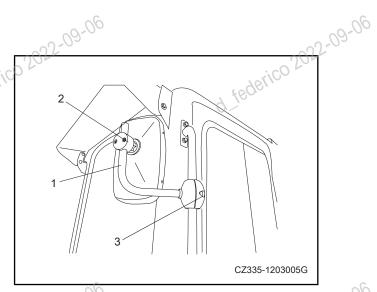
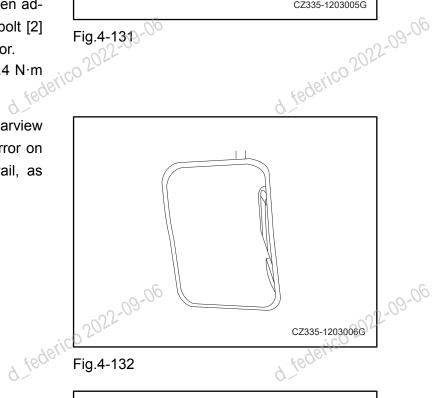


Fig.4-1319



d federico 2022-09-06 Rearview mirror [B]

Adjust installation of the rearview mirror [B] to ensure the personnel at the right rear side of the machine can be seen.

- Install the rearview mirror [B] in the position as shown in the right Figure.
- If the mirror can't move smoothly when adjusting the angle, release the fixing bolt [4] and the fastening lever bolt [5] of mirror. Tightening torque of bolt [4]x: 4.0~5.4 N·m (0.41~0.55kgf·m)

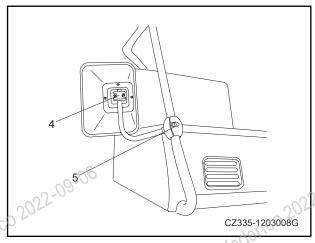


Fig.4-133

 When adjusting the angle of the rearview mirror, the sight line entering the mirror on the side of the machine shall prevail, as shown in the right Figure.

Seat belt

WARNING

- Before using the seat belt, check whether the seat belt and its mounting seat are defective, and replace them if worn or damaged.
- Even if the seat belt looks normal, it shall be replaced every 3 years. The production date of the seat belt is marked on its back.
- Wear seat belt during operation.
- The seat belt can't be twisted when it is fastened.

federico 2022-09-06 CZ335-1203009G d_federico 2022-09-06

Fig.4-134

NOTE:

The seat belt is attached with a winding device, so it is unnecessary to adjust the length.

1. Fastening the seat belt

Hold the seat belt clamp [2] and pull the seat belt out from the winding device [1]. Ensure that the seat belt is not twisted, and then insert the latch bolt [3] into the latch [4].

Pull the seat belt gently to ensure that it is fastened.

2. Releasing the seat belt

Press down the red part on the buckle [4], and the latch plate [3] will automatically pop up from the buckle [4].

the winding device [1]. Hold the seat belt clamp [2] to slowly wind the seat belt winding device. clamp [2] to slowly wind the seat belt into the winding device [1].

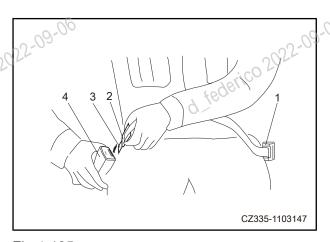


Fig.4-135



d_federico 2022-09-06

4.3.1.4 Operation before engine start

WARNING

- · Before engine start, check whether the safety lock control lever is firmly located at the locking position.
- If the safety lock control lever is not firmly locked and it knocks with the travel lever or pedal during engine start, the machine will move accidentally and cause serious
- set the safety lock control lever to the locking position regardless of whether the engine is running. When standing from the driver's seat, be

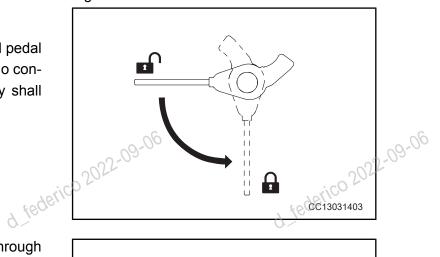
Check whether the safety lock control lever is located at the "LOCK" position.

- 2. Check whether the control levers and pedal are in the "Neutral" position. If there is no contact with the travel lever or pedal, they shall be located in the "Neutral" position.
- 3. Turn the key to the [ON] position. d federico 2022.
 - 4. Monitor the status of the machine through the main interface of the display. For details of the display, see the "Display Screen" section.
 - If there is any fault, the alarm lamp will be
 - In this case, if the fault code is displayed, the corresponding item of the fault code shall be checked immediately.
 - If there is no fault code, there are two possibilities:

The engine coolant temperature is too high; The engine oil pressure is too high or too low.

Fig.4-136

Nerico 2022-09-06



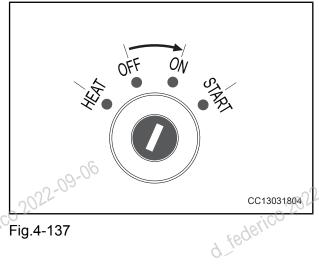


Fig.4-137



d_federico 2022-09-06

4.3.2 Engine start

WARNING

- Start the engine only when sitting in the driver's seat.
- Do not start the engine by short circuiting the engine. This can cause serious personal injury or fire.
- Ensure that there are no personnel or obstacles in the surrounding area, and then make the horn sound and start the engine.
- Do not use start-assisted liquid, because it will cause explosions.
- The exhaust gas is poisonous. When starting the engine in enclosed space, special attention shall be paid to ensure good ventilation.
- Before starting the engine, check whether
 the fuel control knob is located at a low idle
 speed [MIN] position. If the fuel control knob
 is located at the full speed [MAX] position,
 the engine start will suddenly accelerate
 and damage the engine parts.
- The starting switch key can't be kept at the [START] position for more than 10 s consecutively.
 - If the engine is not started, wait for at least 1 minute before restart.
- After the engine is started, it can be operated after the engine oil pressure value is within the normal range. When the engine oil pressure is abnormal, do not operate the travel lever or pedal, and stop the machine immediately for inspection.

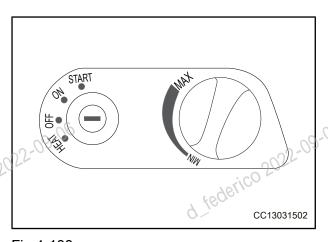
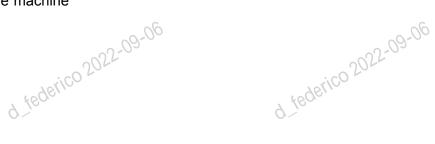


Fig.4-138

federico 2022-09-06

02022-09-06





7-09-06 1. Check whether the safety lock control lever is located at the "LOCK" position. If the safety lock control lever is in the "Unlocking" position, the engine can't be started.

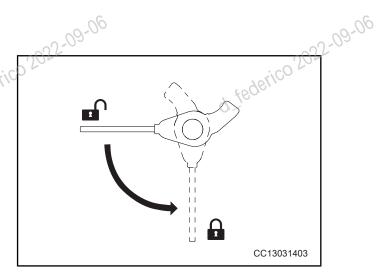


Fig.4-139

2. Set the throttle control knob to a low idle speed [MIN] position. d jede

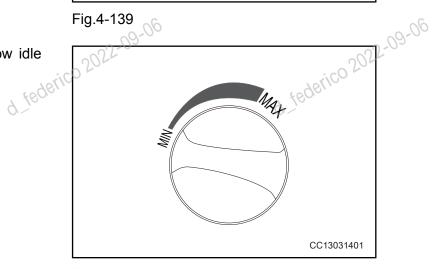


Fig.4-140

3. Turn the ignition switch key to the [ON] position.

NOTE:

When the ambient temperature is lower than 10°C or when required, the engine shall be preheated before start. For details, see the section "Preheating indicator" on Page 4-27.

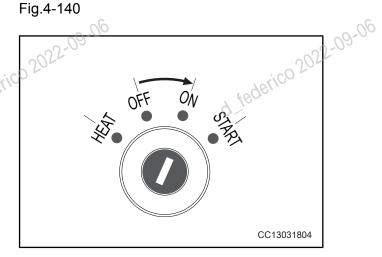


Fig.4-141 d.federico 2022-09-06



4. Turn the ignition switch to the [START] position to start the engine.

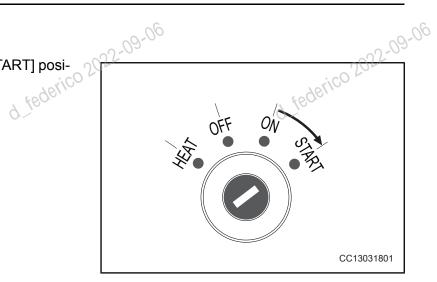


Fig.4-142

5. After the engine starts, release the ignition switch key, and the key will automatically return to the [ON] position.

NOTE:

If the ambient temperature is low, the engine can't be started after the ignition switch key remains in the [ON] position for 10 s. If this condition occurs, wait for at least 1 minute before restart.

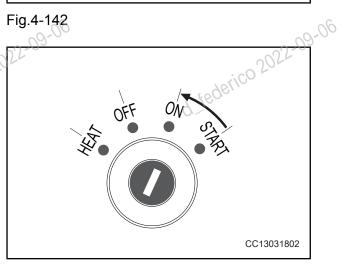
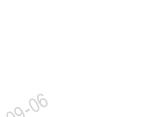


Fig.4-143

gine oil pressure is abnormal. do not travel! the travel lever or pedal.

NOTE:

If the engine oil pressure is still abnormal after 4~5 s, the engine shall be stopped immediately to check the oil level and oil leakage, and take necessary measures.







When the ambient temperature is lower than 10 °C or when required, the engine short preheated.

- Turn the throttle control knob to [MIN] position, and turn the ignition switch to [ON] position. Then the engine will be preheated automatically, and the preheating indicator [2] will come on. After preheating, the preheating indicator will go out automatically, after which the engine may be started.
- After preheating, turn the ignition switch to [START] position to start the engine.
- If the engine is not started, wait for at least 1 minute before next preheating and start attempt.

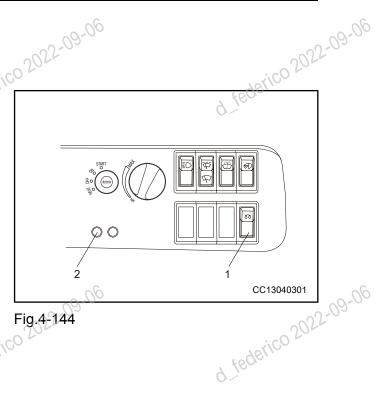


Fig.4-144

4.3.4 Warm-up operation

WARNING

- Turn the ignition switch to the OFF position to stop the engine when there is an emergency or the engine works abnormally or it has other faults.
- When the hydraulic oil temperature is low, do not operate the travel lever or pedal suddenly. Be sure to carry out warm-up operation until the hydraulic oil temperature reaches the proper temperature.
- If no complete warm-up operation is carried out, the machine will have no reaction or sudden and quick action during operation, resulting in serious accidents. The complete warm-up shall be carried out especially in the cold region.
- Before warm-up operation is completed, do not make the engine suddenly accelerate. Do not run the engine at low speed or high speed for more than 20 minutes. This will cause oil leakage of oil supply pipe of the turbocharger, which may lead to a fire hazard. If the engine shall be operated at idle speed, the load shall be always applied to run the engine at medium speed.

After starting the engine, do not start the operation immediately, first carry out the following opera-

- 1. Adjust the throttle control knob to keep the engine running at low speed (1,100 rpm) for about 5 minutes.
- 2. Adjust the throttle control knob to make the engine run at medium speed (about 1,400 rpm), and then slowly operate the bucket back and forth for 5 minutes.

- 3. Adjust the throttle control knob to make the engine run at high speed, and then operate the boom, arm and bucket for 5~10 minutes 4. Complete the actions of the excavator for several times to finish its warm-up.
- 5. Check whether displays of the instrument are normal after the warm-up operation. If coolant temperature (see the display) and hydraulic oil temperature (50~80°C) fail to reach the normal value, continue to carryout warm-up operation.

02022-09-06

6. Check whether the exhaust color, noise, or vibration is abnormal. In case of abnormality, do repair.

4.3.5 Shutting down the engine

CAUTION

- If the engine is not stopped under the idle status, its service life will be shortened. In case of emergency, do not emergently stop the engine at high speed. Otherwise, the cylinder head will have fatigue crack and the supercharger bearing will be burnt.
- 1. Operate the engine at a low idle speed for about 5 minutes to gradually cool it down.
- 2. Turn the ignition switch to the [OFF] position, shut down the engine, and remove the key from the ignition switch. key from the ignition switch.

NOTE:

If the engine is too hot, do not suddenly shut it down, but run it at low idle speed to cool it down first.

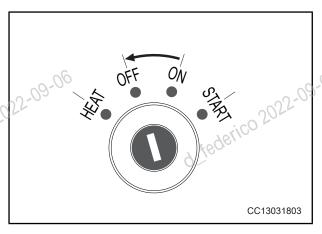


Fig.4-145





4.3.6 Machine operation

4.3.6.1 General

WARNING

- Before moving the machine, check whether the area around the machine is safety and sound the horn.
- No one is allowed to enter the area around the machine.
- · Remove any obstacles on the traveling path.
- There is a blind spot at the back of the machine, so pay special attention to it during reverse traveling.

Before operating the travel lever or traveling pedal, it is necessary to confirm that the guide federico 2022-09-06 left and right steering directions are also opposite)

wheel [A] is in front of the machine and the sprocket [B] is at the end of the machine [C]. If the sprocket is located in front of the machine, the driving direction of the machine will be opposite to the operation direction of the travel lever or the traveling pedal. (The front and rear traveling directions are opposite, and the

4.3.6.2 Preparation for moving the machine

1. Turn the throttle control knob towards the MAX position to the required throttle position to increase the engine speed.

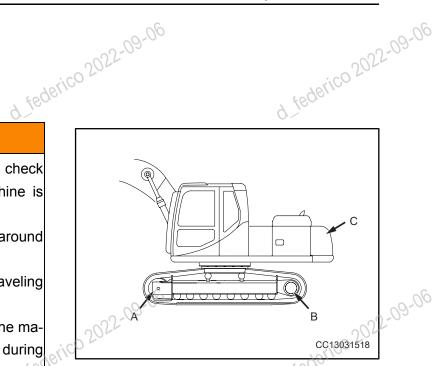
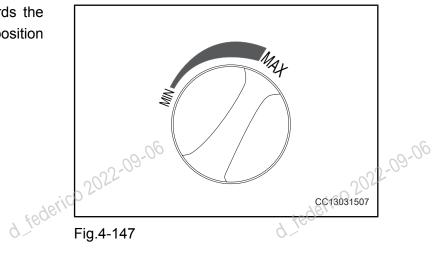


Fig.4-146





d_federico 2022-09-06

LOCK" position, retract the work equipment and lift it up to 40~50 cm above the case. and lift it up to 40~50 cm above the ground.

If the sight line on the right side is poor, lift the boom to ensure a better sight line.

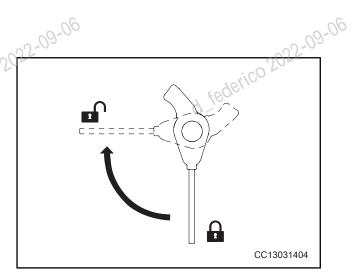


Fig.4-148

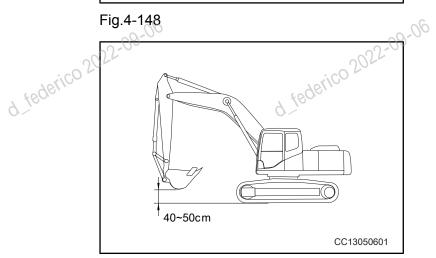


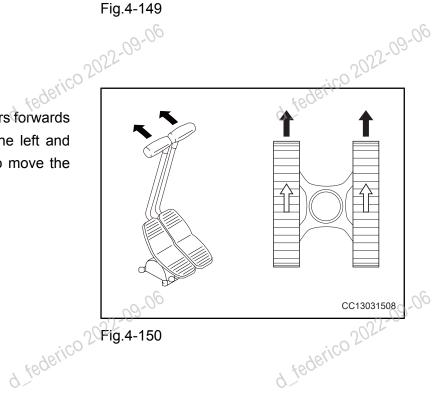
Fig.4-149

4.3.6.3 Moving the machine

Forward

d federico 2022-09-06

 Push the left and right travel levers forwards or step down the front part of the left and right pedals at the same time to move the machine forwards.



Reverse 2022-09-06 Pull the left and right travel levers backwards or step down the rear part of the left and right pedals at the same time to move the machine backwards.

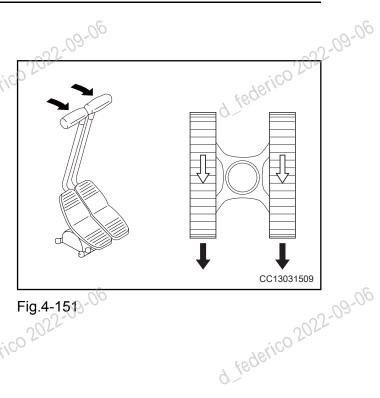


Fig.4-1512

- NOTE: 02022-09-06 If the sprocket is located in front of the machine, when operating the travel pedal, the driving direction of the machine will be opposite to the operation direction of the travel lever or the traveling pedal.
- Operate the travel pedal or pedal in the same direction and in the same range to ensure that the machine runs in a straight line.
- If the traveling speed of the machine is abwarm-up operation. In addition, if the undercarriage traveling body is blocked by mud and the traveling speed of the machine is abnormal room. and the traveling speed of the machine

4.3.6.4 Stopping the machine

A CAUTION

- Avoid stopping the machine suddenly.
- When stopping the machine, reserve d.federico 2022-09-06 d federico 2022-09-06 enough space to leave the machine.

d_federico 2022-09-06

als at the same time to stop the machine.

The travel lever or pedal

turn to the neutral [N] position after release.

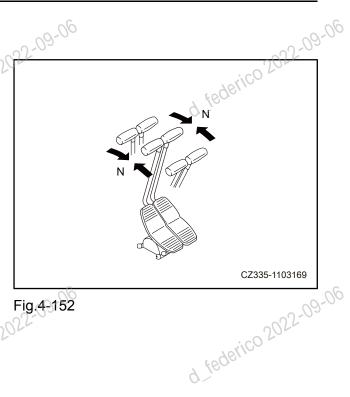


Fig.4-152 d federico 2022

4.3.7 Machine steering

4.3.7.1 General

Check the sprocket position before operating the travel lever or traveling pedal. If the sprocket is located in front part, the operation direction of the travel lever or pedal will be opposite to the movement direction of the machine.

Jerico 2022-09-06 Try to avoid sudden change of direction. In particular, stop the machine before steering in case of reverse rotation (in-situ steering).

4.3.7.2 Turning the machine when it stops

Left turn

Push the right travel lever forwards, and the right track will travel forwards, and the machine will turn to left;

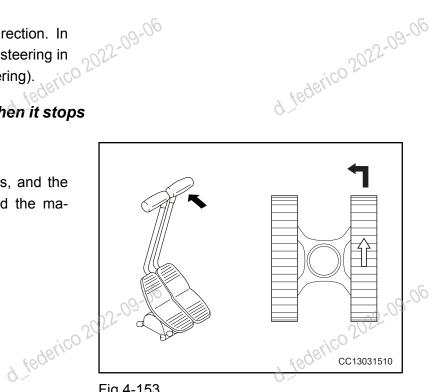


Fig.4-153



Pull the left travel lever backwards, and the left track will travel backwards, and the machine will turn to left. chine will turn to left.

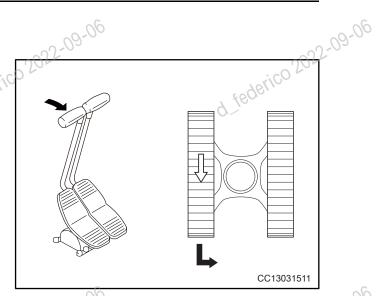


Fig.4-154

Right turn 2022-09-06 Push the left travel lever forwards, and the left track will travel forwards, and the machine will turn to right;

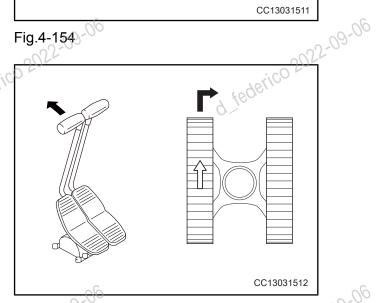
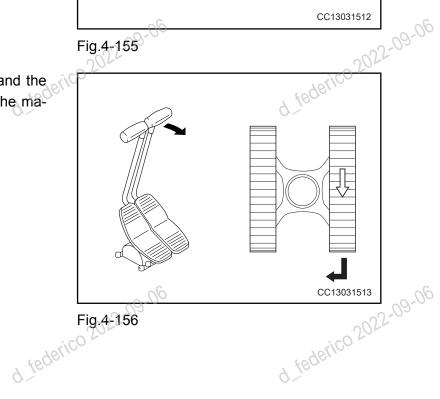
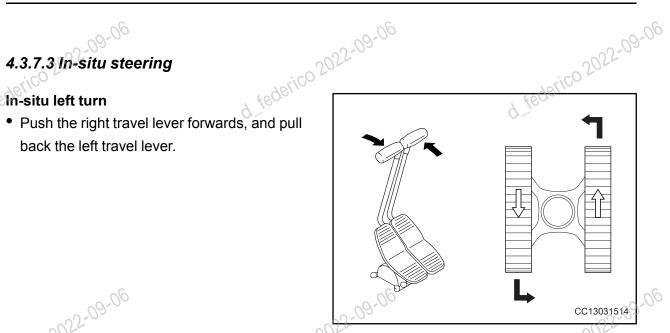


Fig.4-155

2022-09-06 Pull the right travel lever backwards, and the right track will travel backwards, and the machine will turn to right.



In-situ left turn



d_federico2022-09-06

 Push the left travel lever forwards, and pull back the right travel lever.

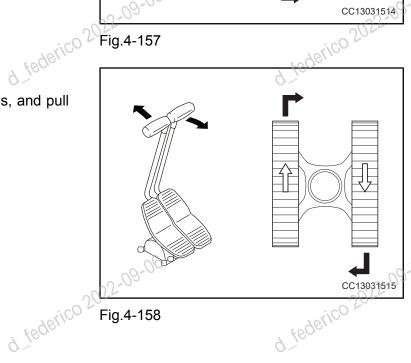


Fig.4-158

d_federico 2022-09-06 4.3.8 Working mode selection

Appropriate working mode shall be selected by the machine display.

Please refer to the relevant instructions in the section "Display" for details.

d. federico 2022-09-06 4.3.9 Control and operation of work

equipment d federico

CAUTION

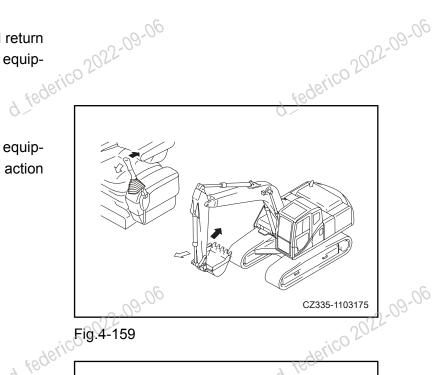
Jerico 2022-09-06 When the engine speed has been reduced by the automatic idle speed function, if the travel lever is operated, the engine speed will suddenly rise, therefore, the travel lever shall be operated carefully.

The control and operation of the work equipment will be completed through travel levers of the left and right work equipment.

When the travel lever is released, it will return to the neutral position, and the work equipment will also remain in that position.

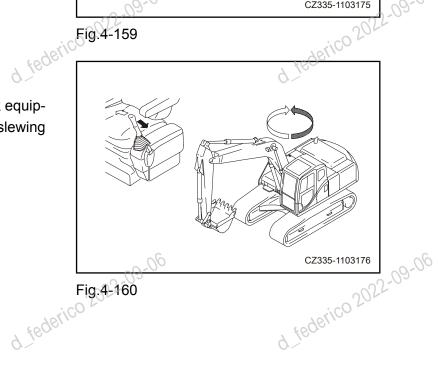
Arm control

Operate the travel lever of the left work equipment forwards or backwards to control action of the arm.



3derico 2022-09-06 • Slewing control

Operate the travel lever of the left work equipment leftward or rightwards to control slewing of the upper body.



Boom control

Operate the travel lever of the right work equipment forwards or backwards to control action of the boom.

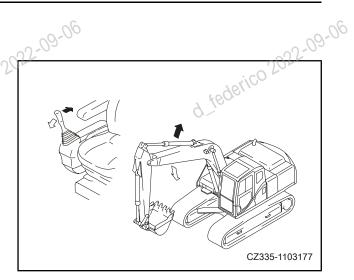


Fig.4-161

Bucket control

Operate the travel lever of the right work equipment leftwards or rightwards to control action of the bucket.

When the work equipment travel lever returns back to the neutral position, even the fuel control knob is set to the full speed position within 5 s after the operation stops, the automatic idle speed mechanism will act and reduce the engine speed to idle speed.

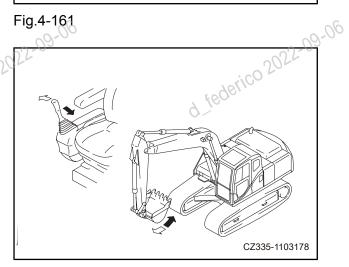


Fig.4-162

The control oil circuit of the machine is equipped with an accumulator of the switch key is turned to the [ON] position and the safety lock control lever is turned to the "Unlocking" position within 15 s after engine stop, even though the engine is stopped, the travel lever can be operated to lower down the work equipment to the ground.

This step can also be used to release the residual pressure in oil circuit of the hydraulic d federico 2022-09-06 cylinder or to remove boom after the machine loaded onto the trailer. d federico 2022



4.3.10 Prohibited operation

CAUTION

- Berico 2022-09-06 · When the machine is traveling, if it is necessary to operate the control lever of the work equipment, stop the machine and then operate the lever.
- If any travel lever shall be operated at the automatic idle speed, the engine speed will suddenly rise.

The operation with slewing force is prohibited 2

Do not compress the ground or break objects with slewing force. This will be dangerous, and will dramatically shorten the service life of the machine.



Fig.4-163

The operation with traveling force is prohibited

Do not insert the bucket into the ground and use the traveling force for digging. This will damage the machine or the work equipment.

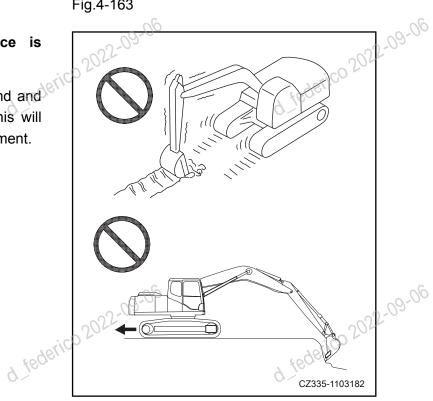


Fig.4-164



The operation when the hydraulic cylinder reaches the end of the stroke is prohibited

If the cylinder piston rod is operated to the end of its stroke, the use of the work equipment and the impact of some external force will damage the hydraulic cylinder and cause personal injury. Avoid operation when the hydraulic cylinder is fully retracted or fully extended.



Fig.4-165

The operation with the bucket drop force is prohibited

- 1. Do not use the drop force of the bucket for digging, crushing or piling. This will dramatically shorten the service life of the machine.
- 2. To avoid damage to the hydraulic cylinder, do not hit the ground with a bucket or tamp it with a shovel when the bucket cylinder is fully extended (the bucket is fully retracted). d federico 2022

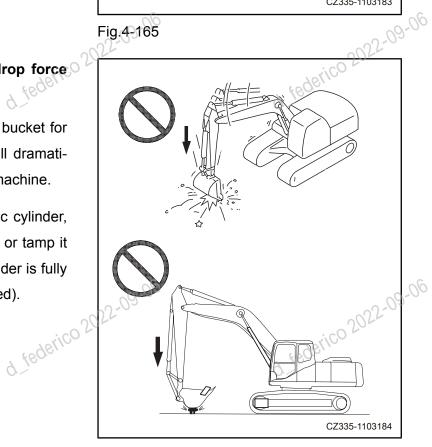


Fig.4-166

It is forbidden to dig hard rock ground

Do not try to dig the hard rock ground directly, ue 2022-09-06 and it is recommended to break it in other ways before digging. This will not only reduce the damage to the machine, but also be economical.





The operation with the deadweight of the jederic machine is prohibited

Do not dig with the force arising from deadweight of the machine.



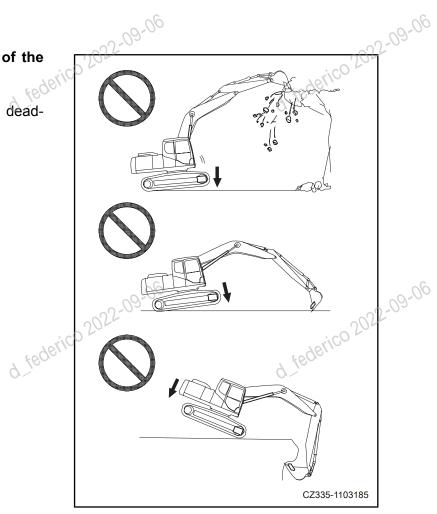


Fig.4-167

It is not allowed to suddenly switch the travel lever or pedal during traveling at high speed

- 1.Do not operate the control lever or pedal suddenly to make the machine move quickly.
- 2. Do not suddenly switch the control lever or pedal to the reverse [B] from forward [A] position (or from reverse [B] to forward [A] position).
- d.federico 2022-09-06 3. Do not suddenly release the control lever or pedal during traveling at high speed to stop the machine. d jeder

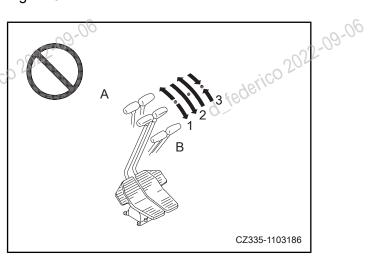


Fig.4-168

4.3.11 Allowable water depth

When the machine is driven out from the water, if the slope angle is larger than 15°, the rear part of the superstructure will fall into the water, the engine fan will touch the water, and thus will be damaged.

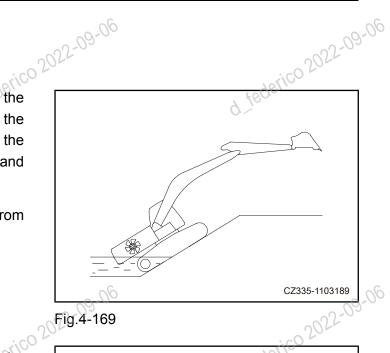
Be careful when driving the machine out from the water.

- jico 2022-09-06 Do not drive the machine into the water deeper than the center of the sprocket [1].
 - Apply lubricating grease to the parts that have been immersed in water for a long time until the old lubricating grease is completely extruded from the bearing (especially around the bucket pin).
 - The machine can be operated in water only when the work foundation of the machine has sufficient strength to avoid water depth higher than center of the sprocket in case of sinking of the machine.
- If the slewing support, the slewing gear and the center swivel joint are immersed in water, remove the drain plug to remove the muddy water, sweep the slewing area and install the plug. Lubricate the internal slewing mesh gear and slewing bearing.

4.3.12 Operation on a slope

4.3.12.1 General

Be sure to operate or drive the machine in the following correct ways, the machine can be stopped safely even when the machine is slipping or becoming unstable.



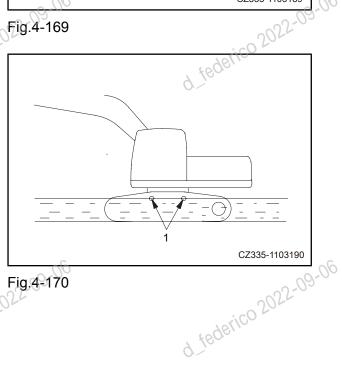


Fig.4-170



WARNING

- When working on a slope, turning or operation of the work equipment will make the machine unbalanced and tilting, so this operation shall be avoided.
- It is very dangerous to slew the loaded bucket downhill. If this operation is required, a platform shall be built on the slope with soil to make the machine remain horizontal during operation.
- Do not drive the machine on a steep slope or downhill, it may turn over.
- Do not turn the machine on a slope or drive it across a slope. Be sure to carry out these operations on a flat ground.
- It may be a little bit further, but it will be safe.
- When driving the machine uphill, if the track shoe slips or only the force of the track is available, the machine can't be driven uphill. Do not use the pull of the arm to help drive the machine uphill.
- 1. When driving down a steep slope, use the control lever and throttle control knob to the low traveling specifies. the steep slope with an angle larger than 15°. adjust the work equipment to the position as shown in the right Figure and reduce the engine speed.

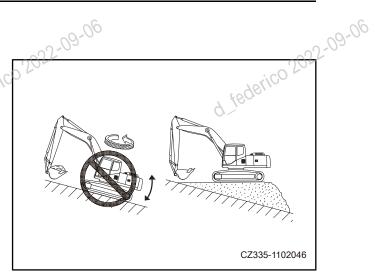


Fig.4-171

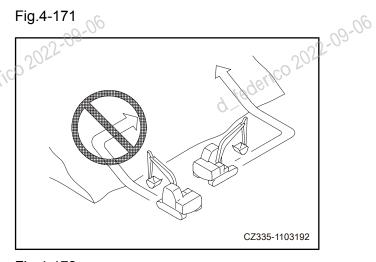
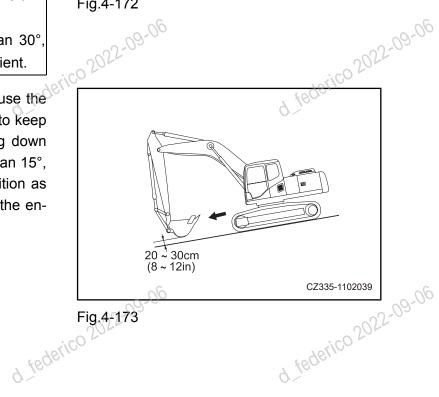


Fig.4-172



4-100

2. When driving up a steep slope, extend the work equipment to the front part to ensure the angent of the steep slope. ance. Keep the work equipment about 20~30 cm higher than the ground and ensure traveling at low speed.

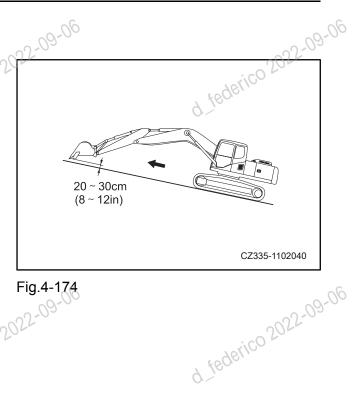


Fig.4-174 rederico 2022-09-1

4.3.12.2 Downhill traveling

 Turn the travel lever to the neutral position to ensure that the brake can work automatically.

4.3.12.3 Engine flameout on a slope

• If the engine is stopped during the uphill traveling, turn the travel lever to the neutral position, lower down the bucket to the 4.3.12.4 Cab door when the machine is on a slope

- If the engine is stopped when the machine is on the slope, do not use travel lever of the left work equipment for slewing. The upper slewing platform will be rotated under its own deadweight.
- When the machine is on the slope, do not d federico 2022-09-06 open or close, the cab door, which will change the machine stress suddenly. Be sure to keep the cab door open or closed. d federico





d_federico 2022-09-06 4.3.13 Driving the machine out of the mud

4.3.13.1 General

Be careful to avoid getting stuck in the mud. If the machine is stuck in the mud, drive the machine out with the following methods.

4.3.13.2 Track on one side gets stuck in the mud

Ensure that the bottom of the bucket is in contact with the ground when the machine is jacked up with the boom or the arm. The angle between the boom and arm shall be 90°~110°

It also applies when using reverse mounted bucket.

When only track on one side gets stuck in the mud, jack up the track with a bucket, and then pave a board or log on it and drive out the machine.

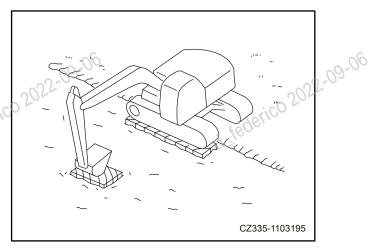
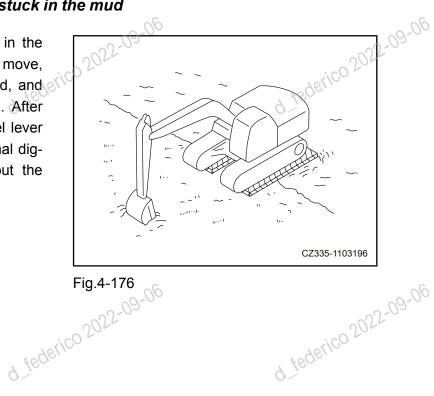


Fig.4-175

4.3.13.3 Tracks on both sides get stuck in the mud

When tracks on both sides get stuck in the mud and slip and the machine can't move, pave the board with the above method, and dig the bucket into the ground ahead. After that, retract the arm and turn the travel lever to the "Forward" position with the normal digging operation methods, and drive out the machine.



d federico 2022-09-06

4.3.14 Recommended purpose

4.3.14.1 General

d_federico 2022-09-06 In addition to the following purposes, the operation range can be increased with the accessories.

4.3.14.2 Backhoe operation

The backhoe is suitable for digging of area below the machine.

When the machine is in the status as shown on the right (namely, both angle between the bucket cylinder and H-link and angle between the arm cylinder and arm is 90°), the maximum digging strength can be obtained from the cylinder thrust. When effectively using this angle during digging, the work efficiency can be fully played.

The arm digging range includes the area between 45° away from the machine and 30° close to the machine.

Depending on the digging depth, the above range may be slightly different, but it shall be kept in the above range as much as possible, and do not operate the cylinder to the end of its stroke.

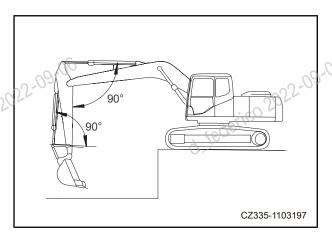


Fig.4-177

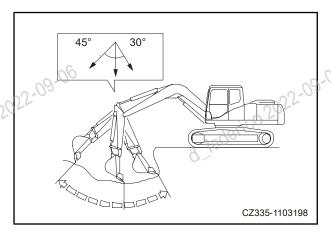


Fig.4-178





4.3.14.3 Ditching operation

- The ditching operation can be carried out effectively by installing a bucket matches with the direction. justing the track to be parallel with the line of the trench to be dug.
- When digging a wide trench, both sides shall be dug, and then the central part shall be cleared.
- When digging in the longitudinal direction, the travel motor shall be placed in the rear part to ensure that the stability and lifting capacity of the machine is the maximum.

During digging operation, adjust the track to be vertical to the shoulder or cliff and locate the sprocket at the back of the cab, so as to ensure that the machine can be easily evacuated when abnormality occurs.

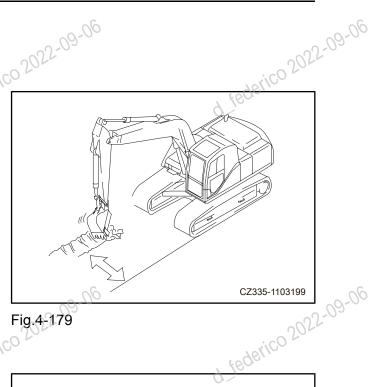
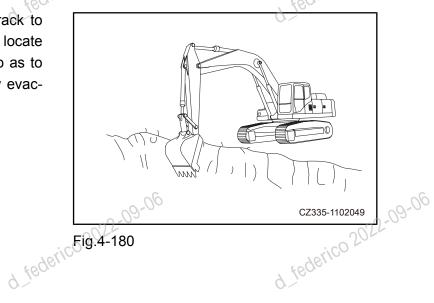


Fig.4-179



federico 2022-09-06 4.3.14.4 Loading operation

When the slewing angle is smaller, park the dump truck in a place visible to the driver to improve work efficiency.

It is more convenient to start loading from the rear part of the dump truck than from the side, and the loading capacity is higher. d federico 2022-09-06

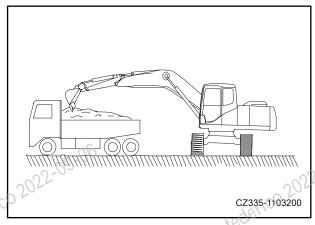


Fig.4-181

4.3.15 Parking

WARNING

- d federico 2022-09-06 If accidentally touching the travel lever, the machine will suddenly move, which may cause serious accidents.
- Before leaving the cab, be sure to turn the safety lock control lever to the "LOCK" position.

When parking the machine, choose a flat, solid ground and avoid dangerous places. If the machine shall be parked on the slope, place a cushion block under the track shoe (as shown) in the Figure). The bucket can be inserted into the ground as an auxiliary safety measure.

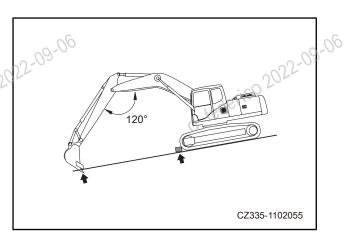


Fig.4-182

1. Turn the left and right travel levers to the neutral [N] position to stop the machine. Jederico 2022-09

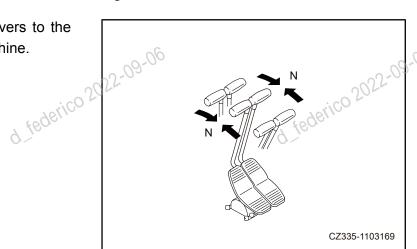


Fig.4-183

d_federico 2022-09-06



7-09-06 2. Turn the throttle control knob to the low idle speed [MIN] position to reduce the engine speed.

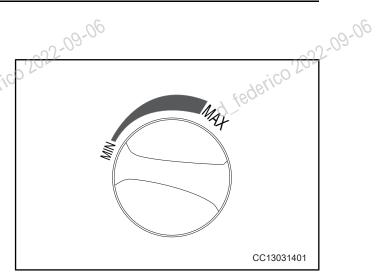


Fig.4-184

3. Lower down the bucket horizontally until its bottom reaches the ground.

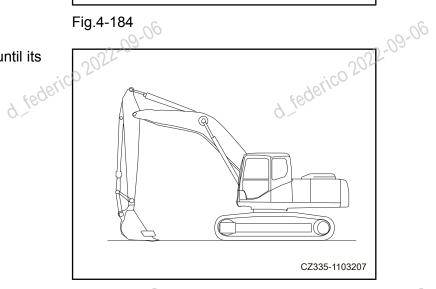
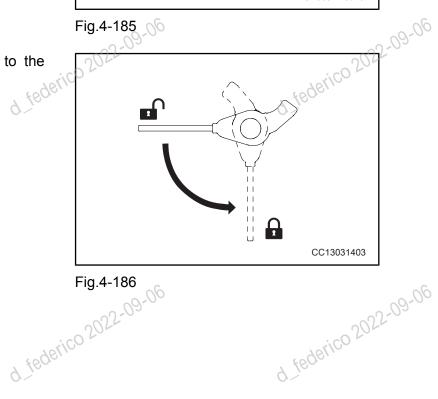


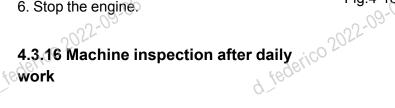
Fig.4-185

7-09-06 4. Turn the safety lock control lever to the d federic "LOCK" position.



d_federico 2022-09-06

- 5. Check the engine coolant temperature (as shown) and the engine oil pressure through the display.
 - If the coolant thermometer is in the red range, cool down the coolant until the needle reaches the yellow range, and then stop the engine.
 - If the alarm prompt is displayed on the display and abnormal engine oil pressure is determined, stop the engine immediately.
 - 6. Stop the engine.



- 1. Carry out walkaround inspection of the machine to check the work equipment, the outside of the machine and the carrier for leakage of oil or coolant. If any problem is discovered, repair it.
- 2. Fill up the fuel tank.
- purities in the engine room. Remove paper or other impurities to avoid fire hazard other impurities to avoid fire hazard. A
 - 4. Remove dirt from the carrier.
 - 5. If the ambient temperature is lower than -35 °C, be sure to drain coolant in the radiator and engine (the freezing point of antifreeze used by SANY Heavy Machinery Co., Ltd. is -35°C).



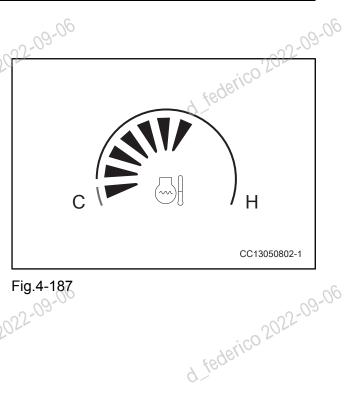


Fig.4-187





4.3.17 Locking

Be sure to lock the following positions

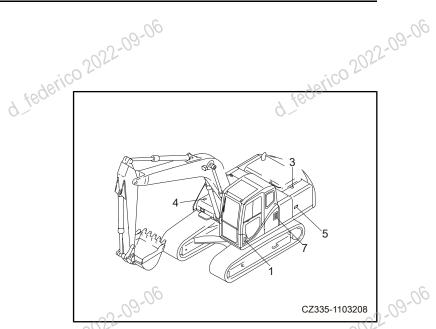
1. Cab door

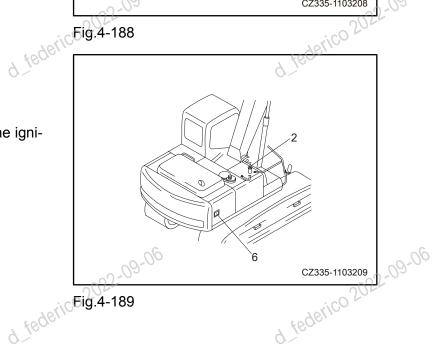
Close windows properly

- 2. Fuel tank filler
- 3. Engine hood
- 4. Tool box cover
- 5. Left door of the machine
- 6. Right door of the machine
- 7.A/C "Fresh Air" inlet

NOTE:

Lock and unlock these positions with the ignition switch key.





d federico 2022-09-06 4.3.18 Operation in cold season

4.3.18.1 Description of operation in cold season

The engine will not be able to start and the coolant may be frozen in a low temperature environment, so it shall be operated according to the following content.

Fuel and lubricating oil

For details of viscosity provisions, see the "Recommended Fuel, Coolant and Lubricating Oil" on page 5-9. d federice d federice

Coolant of cooling system

WARNING

- The antifreeze is poisonous. Be careful not to get it on your eyes or skin. If your eyes or skin are stained with it, rinse with plenty of water and see the doctor immediately.
- When replacing coolant or processing coolant containing antifreeze during radiator repair, please contact the authorized agent of SANY Heavy Machinery or professional company for processing. The antifreeze is toxic, and do not drain it into the sewer or spill it on the ground.
- The antifreeze is flammable. Do not get close to open fire. Do not smoke when dealing with antifreeze.

Note: Please use SANY pure TEEC-L35 antifreeze as coolant. In principle, we do not recommend using any other coolant other than the genuine antifreeze of SANY Heavy Machinery Co., Ltd.

For details on the mixing ratio of the antifreeze during coolant replacement, see the "Coolant of d federico 20 d federico 20 Cooling System" on page 5-6.

Battery

When the ambient temperature drops, the battery capacity will also be reduced. Keep the battery capacity as close to 100% as possible. Do not keep the storage at a low temperature for a long time to avoid difficult start of the machine.

Because the battery capacity will drop at low temperature, it is necessary to cover the battery, or remove it from the machine, store it in a warmer site, and then reinstall the battery when using the machine.

In order to prevent movement failure of the machine on the next day due to frozer and water on the lower body, the following precautions shall be observed:

- Remove all mud and water from the body. In particular, the hydraulic cylinder piston rod shall be cleaned to prevent mud, dirt or water on the piston rod entering the seal and damaging it.
- The machine shall parked on a hard, dry ground. If possible, park the machine on the on the ground to ensure that the machine can be moved on the next day.

 Turn on the drain valve to drain water can be moved on the next day.
- Turn on the drain valve to drain water accumulated in the fuel system to prevent freezing.





- 1e federico 2022-09-06 • Fill up the fuel tank. This can minimize moisture condensation in the tank when the temperature drops.
- After operation in the water or in the mud, remove the water on the lower body according to the following instructions to extend the service life of the lower body.
- 1. When the engine runs at idle speed, rotate the superstructure by 90° to locate the work equipment at the side of the track.
- 2. As shown, lift the machine, raise the track this operation on both left and right tracks. slightly up from the ground and idle it. Repeat

WARNING

• It is dangerous when the track is running idly, and the personnel shall keep a certain distance from the track.

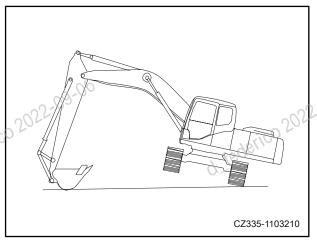


Fig.4-190

4.3.18.3 After the cold season

Replace fuel and lubricant with specified viscosity oil.

viscosity oil.

For details, see the "Recommended Fuel, Coolant and Lubricating Oil" on page 5-9.



d federico 2022-09-06



4.3.19 Long-term storage

4.3.19.1 Before storage

When the machine is stored (for more than 1 month), it shall be changed to the position as shown in the right Figure to protect the cylinder piston rod and prevent it from rusting.

When the machine is stored for a long time (for more than 1 month), operate according to the following content:

- Clean and flush all the parts, and then store the machine indoors. If the machine has to be stored outdoors, choose a flat ground and cover the machine with canvas.
 - Fill up the fuel tank to prevent moisture accumulation.
 - Before storage, lubricate and replace oil.
 - Apply lubricating grease to the exposed part of the piston rod of the hydraulic cylinder.
 - Disconnect the negative terminal of the battery and cover it, or remove the battery from the machine and store it separately.
 - For machines equipped with accessories, the accessory control pedal shall be turned to a locking position.
- To prevent rust, fill the coolant recommended by SANY Heavy Machinery.

4.3.19.2 During storage

WARNING

- When the machine is indoors and it needs to anti-rust operation, open doors and windows to improve ventilation and prevent gas poisoning.
- In the case of storage for more than 6 months, refer to "5.9.13 Maintenance during long-term storage".

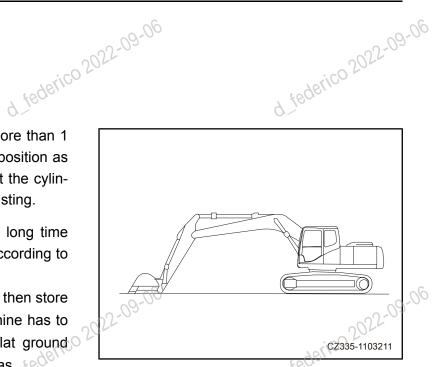


Fig.4-191



- ated once a month and shall be driven in a short distance, and the parts shall be coated with a month and shall be driven in a short distance. 22-09-06 During storage, the machine shall be opershort distance, and the parts shall be battery shall be charged.
- Wipe off all lubricating grease on the piston rod of the hydraulic cylinder prior to the work equipment operation.
- · If the machine is equipped with HVAC, operate the HVAC for 3-5 minutes every ated. In addition, the refrigerant shall be checked twice a year. checked twice a year.



4.3.19.3 After storage

If the machine is stored for a long time, but it is not subject to anti-rust operation every month, please contact the authorized agent of SANY Heavy Machinery before reuse. When reusing the machine after long-term storage, please observe the following content before use:

- Wipe off lubricating grease of the piston rod of the hydraulic cylinder.
- Fill all lubricating parts with oil and lubricating grease.
- the oil before and after starting the engine. If there is water in the oil, drain the water completely and timely. When the machine is stored for a long time, the moisture in the air will be mixed with oil. Check d federico

4.3.19.4 Starting the engine after long-term storage

When the engine is started after long-term storage, it shall be fully warmed up.

For details, see the "Warm-up Operation" on page 4-83.

4.4 Transportation

4.4.1 General

d federico 2022-09-06 When transporting machines, comply with all relevant laws and regulations, and pay attention to safety.



d_federico 2022-09-06

- Select a transportation method that matches the weight and size provided "Technical Specificat"

 Ti
 - The weight and size provided in the "Technical Specification" may vary depending on the type of track shoe, bucket or other accessories.
 - For details of transportation of machines equipped with the cab protection cover, Jerico 2022-09-06 please contact the authorized agent of SANY Heavy Machinery.

4.4.3 Machine loading and unloading with trailer

4.4.3.1 General

Be sure to observe the following items of the access board and trailer platform:

- Use access board with sufficient width, length, thickness and strength and with a maximum slope of 15° for loading and unloading.
- When using the accumulated soil, it is necessary to fully compact the accumulated soil to prevent the slope from collapsing.
 - To prevent the machine from slipping on the access board, clean the track and access board of the machine before loading and unloading.
 - If there is water, snow, lubricating grease, oil or ice on the surface of access board, the machine may slip.

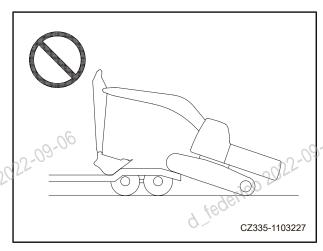


Fig.4-192

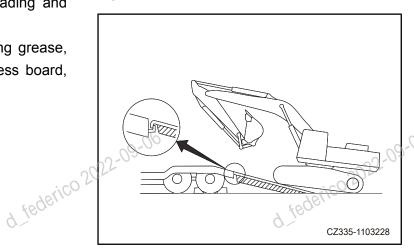


Fig.4-193

- 1. Loading and unloading are allowed on a solid and flat ground only. Keep a soft tance from the roadsid-
- 2. Apply the brake of the trailer and place a cushion block [1] under the tire to prevent the trailer from moving.
- Place the left and right access boards [2] to make them parallel to each other and equal to the left and right spacing of the trailer center [3]. The maximum installation Angle [4] will be 15°. If the access board is bent significantly under the weight of the machine, place a cushion block under the access board to prevent the access board from bending.
- 3. Switch the traveling speed to the low speed status by pressing down the function button of the display, and disable the automatic idle speed function.
- 4. Turn the throttle control knob to the [MIN] position to set the engine speed at low idle speed.

WARNING

- When driving the machine up or down the trailer, the automatic idle function shall be canceled. If the automatic idle speed function is enabled, the speed of the engine will change dramatically.
- When driving the machine up or down the trailer, the traveling speed shall be kept in d.federico 2022-09-06 the "Low Speed" mode. Do not switch the traveling speed randomly. d federico 29

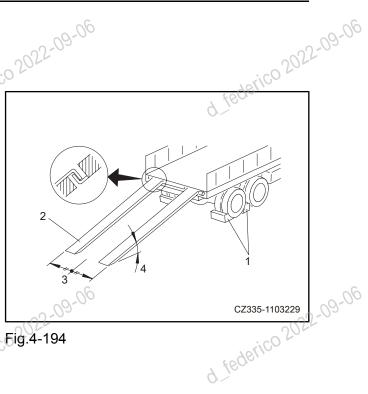


Fig.4-194

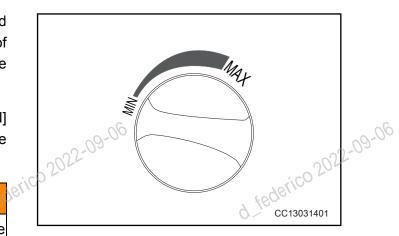


Fig.4-195



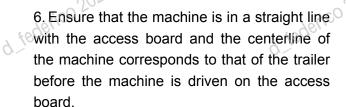
5. If the machine is equipped with the work equipment, place the work equipment in the state of front part, and drive the machine forwards to the access board. If there is no work equipment, drive the machine backwards to the access board.

Support the bucket onto the trailer immediately after the machine is driven on the access board.

Especially in case of backward traveling, be sure to follow the instructions and signals of the commander.

WARNING

- Do not adjust direction on the access board, otherwise, the machine will turn over.
- Do not operate any control lever other than the travel lever on the access board.
- If needed, drive the machine to the ground away from the access board or back to the trailer before direction adjustment.



Slowly drive the machine in the direction of the access board.

Lower down the work equipment as much as possible provided no impact is made. d.federico 2022-09-06 d. federico 2022-09-06

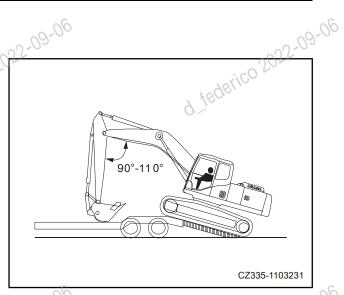


Fig.4-196

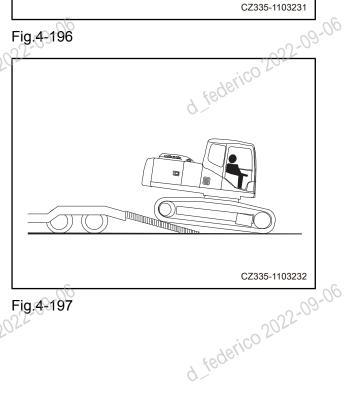


Fig.4-197





- 7. Drive the machine slowly forwards until all the tracks are located on the trailer and firmly touch the flat plate.
- 8. When passing the rear wheel of the trailer, the machine will lean forward. Be slow and careful, and do not make the work equipment touch the trailer body.
- 9. Slightly lift the bucket, retract the arm and keep it in the lower part, and then slowly rotate the superstructure by 180°.
- 10. Fully extend the bucket cylinder and arm cylinder, and then slowly lower down the boom
- 11.Place a wooden cushion block on one end of the bucket cylinder to prevent it from touching the baseplate and damaging the cylinder.

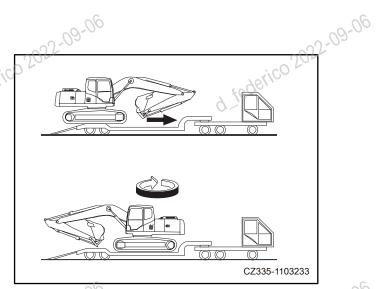
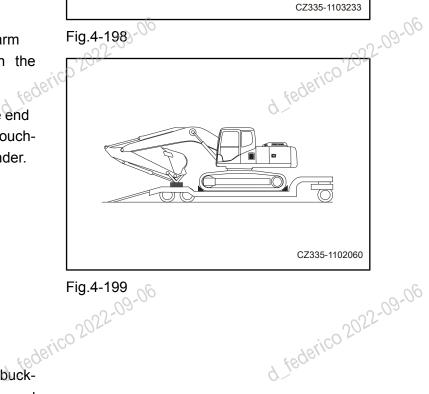


Fig.4-198



4.4.3.3 Securing

- In order to prevent the damage of the bucket cylinder during transportation, the wood shall be placed under the top end of the bucket H-link to prevent the bucket cylinder from touching the floor directly.
- Check whether the engine hood latch is locked. If the engine hood is not locked, it will be opened during transportation. d federico 2022-09-06 d. federico 2022-09-06

Fix the machine on the trailer with following method:

1. Fully extend the bucket and are the following method:

and then slowly lower down the boom.

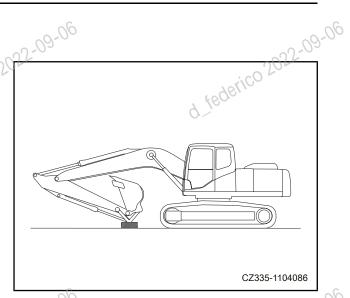


Fig.4-200

- 2. Turn the safety lock control lever to the "LOCK" position.
 - 3. Stop the engine, and then remove the key from the ignition switch.
 - 4. Close all the doors, windows and covers. Lock the cover, cap and door with locks.

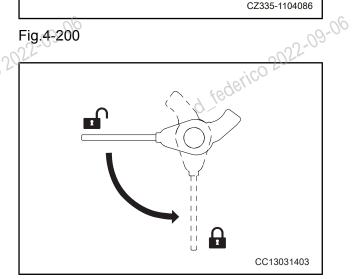
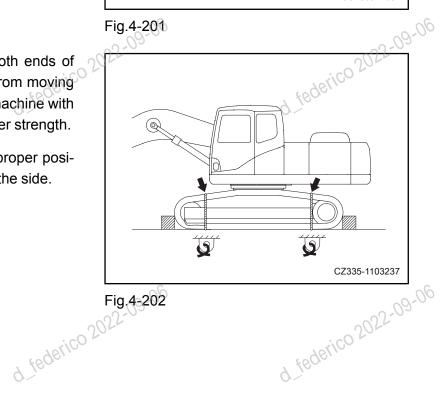


Fig.4-201

5. Place the cushion blocks on both ends of the track to prevent the machine from moving during transportation, and fix the machine with iron chains or wire ropes with proper strength.

In particular, fix the machine in a proper position to ensure that it will not slip to the side.



Rearview mirror

The rearview mirror is located in the position as shown in the right Figure.

If the rearview mirror is damaged or it shall be reinstalled after removal for transportation, the following method shall be adopted.

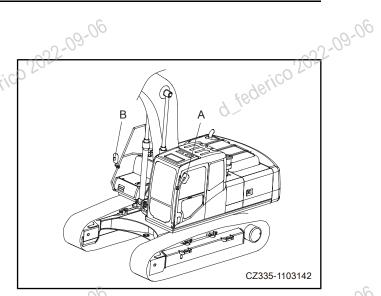


Fig.4-203

Removal 2022-09-06

- 1. Unscrew the mounting bolt [2], and then remove the rearview mirror [1] from the support [3].
- 2. Unscrew the bolt [4], and remove the support [3] and clamp [5] from the handrail.

Installation

- 1. Install the support [3] and clamp [5] onto the handrail, and then tighten the bolt [4].
- 2. Install the rearview mirror [1] onto the support [3], and then tighten the mounting bolt [2].
- · Make adjustment after installing the rearview mirror. For details, see the "Rearview Mirror" on page 4-75.

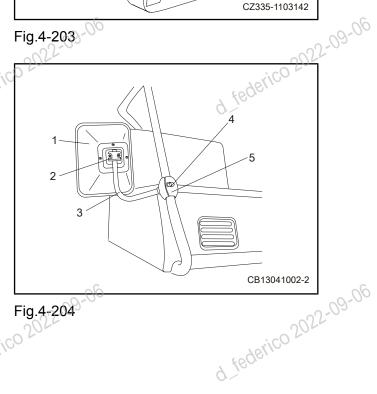


Fig.4-204

d federico 2022-09-06

d_federico 2022-09-06

4.4.3.4 Unloading

- 1. The machine can only be loaded and unloaded on a solid and flat ground. Keep a safe distance from the roadside.
 - 2. Apply the brake of the trailer and place a cushion block [1] under the tire to prevent the trailer from moving.
- Place the left and right access boards [2] to make them parallel to each other and equal to the left and right spacing of the trailer center [3]. The maximum installation Angle [4] will be 15°. If the access board is bent significantly under the weight of the machine, place a cushion block under the access board.
 - 3. Remove the iron chains and wire ropes for fastening the machine.
 - 4. Start the engine, and fully warm it up.
 - 5. Turn the safety lock control lever to the "UN-LOCK" position.
- 6. Switch the traveling speed to the low speed status by pressing down the function button of the display, and disable the automatic idle speed function.

WARNING

- When driving the machine up or down the trailer, the automatic idle function shall be canceled. If the automatic idle speed function is enabled, the speed of the engine will change dramatically.
- Jerigo 2022-09-06 When driving the machine up or down the trailer, the traveling speed shall be kept in the "Low Speed" mode. Do not switch the traveling speed randomly.

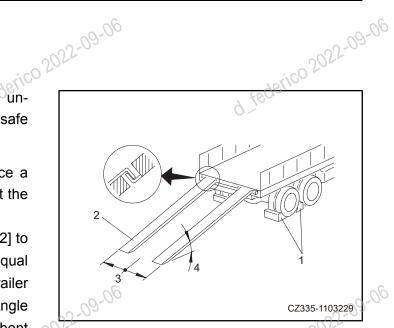
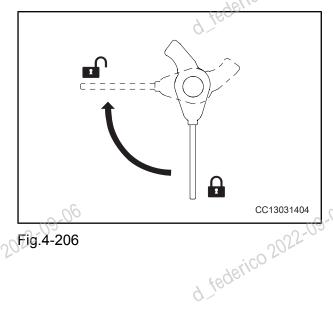


Fig.4-205





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

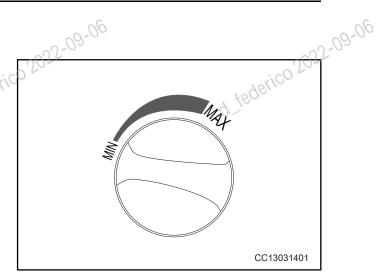


Fig.4-207

- 8. Lift the work equipment, retract the arm back to the lower part of the boom, and slowly
- 9. When driving the machine to the top of the rear wheel of the trailer, stop it.

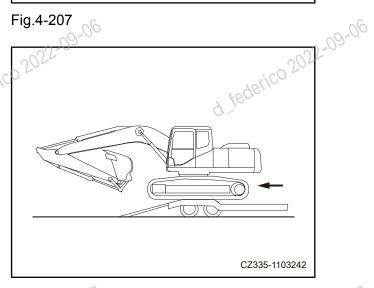
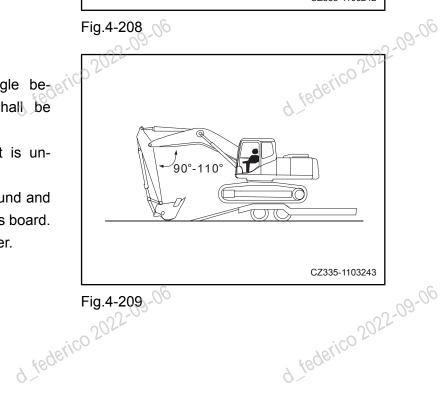


Fig.4-208

- NOTE: 2022-09-06 When unloading machine, the angle between the arm and the boom shall be 90~110°.
- The machine will be damaged if it is unloaded when the bucket is retracted.
- Do not insert the bucket into the ground and the machine is driven onto the access board. This will damage the hydraulic cylinder.



10. When driving the machine onto the access board, adjust the angle between the arm and the boom to 90~110°, lower down the bucket to the ground, and slowly move the machine.

11. When driving the machine away from the access board, slowly operate the boom and the bucket, and drive down carefully until the machine is completely away from the access board.

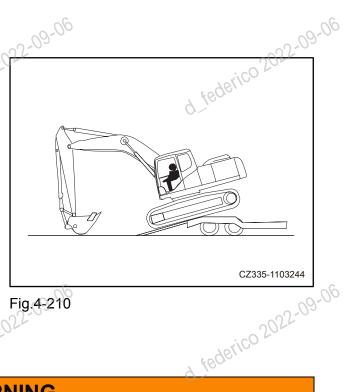


Fig.4-210

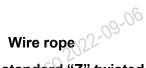
4.5 Lifting

WARNING

- Only the qualified and experienced operator holding official licensee (according to local law) can operate the crane.
- Do not lift a machine when someone stands on the machine.
- Do not allow anyone to enter the lower or surrounding area of the lifted machine.
- Ensure that the wire rope used for lifting is strong enough to bear the weight of the machine. Do not use damaged or aged cables or lifting tools.
- Do not lift the machine when the upper body turns to the side of the machine.
- Before lifting, rotate the work equipment to one end of the sprocket and make the undercarriage parallel to the longitudinal centerline of the upper structure.
- The safety lock control lever shall be turned to the locking position before lifting to prevent the machine from accidentally moving.
 - Keep the machine level during lifting.
 - Do not lift the machine guickly. Otherwise, the lifting cable or lifting tool will be overloaded, which may lead to fracture.
 - Do not lift the machine with any other position except that provided in the following steps, or use any of the lifting equipment except that provided in the following steps. Otherwise, the machine will lose its balance.

Wire rope selection

- The lifting procedure is applicable to the standard technical specification machine. For details of machine weight, see the "Technical Specification" section of this manual.
- Select the suitable wire rope according to the weight of the excavator. Refer to the following table.



Ungalvanized standard "Z" twisted rope

00.06	Wire rope 22-09-06	09-
Un	Wire rope galvanized standard "Z" twisted ro	ppe (ederico 2022-09-6
Nominal diameter of wire rope	Allowed	
mm	kN	Ton
10	8.8	0.9
12	12.7	1.3
14	17.3	1.7
16	22.6	2.3
18	28.6	2.9
20,0-00	35.3	3.6
2025	55.3	3.6 5.6
30	79.6	8.1 derico
40	141.6	14.4
50	221.6	22.6
60	318.3	32.4

NOTE:

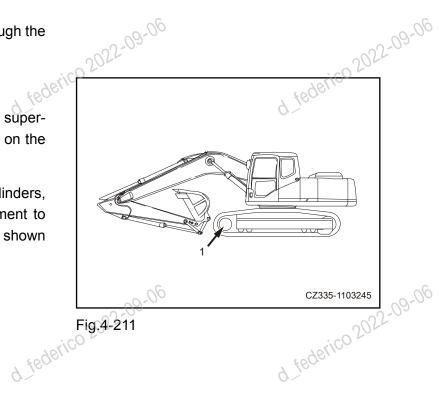
The lifting method will be different according to the actual accessories and options on the machine. For proper lifting method, please contact the authorized agent of SANY Heavy Machinery.

NOTE:

Lift the machine on the flat ground through the following methods

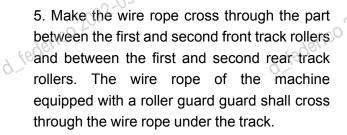
Standard specification machine

- 1. Start the engine, and then swing the superstructure to locate the work equipment on the side of the sprocket [1].
- 2. Fully extend the bucket and arm cylinders, and then lower down the work equipment to the ground with the boom cylinder, as shown on the right.



- 3. Turn the safety lock control lever to the "LOCK" position.

 4. Shut down the engine check with the safety lock control lever to the "Lock" position.
- are obstacles around the cab, and then leave the machine. Close doors and windows of cab.



- 6. Adjust the lifting angle of wire rope [A] to 30~40°, and then slowly lift the machine.
- 7. After the machine is lifted off the ground, confirm that the hook condition and lifting condition are normal, and then slowly lift the machine.

WARNING

- If the cable is too close to the hook, it will slip off the hook and cause a serious accident. The middle part of the hook has the maximum strength.
- Do not lift heavy objects when the suspension angle between the cable and the hook is large. If the heavy object is lifted with two or more cables, the strength of each
- If lifting with a single wire rope, the load may rotate during lifting, and the may be released or slip from the winding position and cause a dangerous accident.

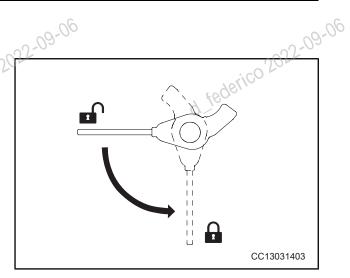


Fig.4-212



Fig.4-213



d federico 2022 09-06	d. fedeiro 2022-09-06	d. federico 2022-09-06
3 tederico 2022-09-06	09.06 0.2022-09.06	d. ederico 2022-09-06
1. federico 2022 09-06		d. federico 2022-09-06
d. federico 2022.09-06	d. 1ederico 2022-09-06	d. føderico 2022-09-06



Maintenance

5 I	Maintenance	5-1
5.1	Maintenance Information	5-5
, ₅₀ 592	? Oil, fuel and coolant	5-7
9-1	Maintenance Information	5-7
	5.2.2 Fuel	
	5.2.3 Coolant	5-8
	5.2.4 Grease	5-9
	5.2.5 Oil and fuel storage	5-9
	5.2.5.1 General	5-9
	5.2.5.2 Filter element	
	5.2.6 Electrical system	
5.3	Wear Parts	5-10
5.4	Recommended Fuel, Coolant and Lubricant	5-11
101	5.4.1 General	5-11
4 tegle	5.4.2 Table of recommended fuel, oil and coolant	5-13
0.7	5.4.1 General	5-15
	General	5-15
	Safety Critical Parts	
	' Maintenance Schedule	
5.8	Maintenance Procedures	
	5.8.1 Lockout and tag-out measures	
	5.8.2 Initial 50 hours of operation	
	5.8.3 Initial 500 hours of operation	5-23
	5.8.3.1 Swing drive oil - change	5-23
	5.8.3.2 Final drive oil - change	5-24
inder	5.8.4 When Required	5-25
9 180	5.8.3.1 Swing drive oil - change	5-25
	5.8.4.2 Track tension - inspect/adjust	5-20
	5.8.4.3 Bucket - replace	5-29

06	00
5.8.4.4 Bucket tips - replace	. 5-31)
5.8.4.5 Bucket clearance - adjust	5-32
5.8.4.6 Window washer fluid level - check/fill	. 5-34
5.8.4.7 Refrigerant level - check	. 5-35
5.8.4.8 Ceiling window gas spring - inspect	
5.8.5 Inspection Prior to Startup	
5.8.6 Every 100 service hours	
5.8.6.1 Lubrication	
5.8.7 Every 250 service hours	. 5-41
5.8.7.1 Air filter element - inspect/clean/replace	. 5-41
5.8.7.2 Fan belt tension - inspect/adjust	. 5-45
5.8.7.3 Compressor belt tension - inspect/adjust	. 5-46
5.8.7.4 Pipe clamps of hydraulic system - check	. 5-47
5.8.8 Every 500 service hours	5-47
5.8.8.1 Geberal	. 5-47
5.8.8.2 Swing bearing - lubricate	. 5-47
5.8.8.3 Engine pan oil and filter element - change/replace	. 5-48
5.8.8.4 Swing pinion gear grease level - inspect/fill	. 5-50
5.8.8.5 Primary fuel filter element - replace	. 5-51
5.8.8.6 Secondary fuel filter element - replace	. 5-53
5.8.8.7 Radiator and oil cooler fins - inspect/clean	. 5-56
5.8.8.8 Air conditioner fresh air/recirculation filter - clean	. 5-58
5.8.8.9 Swing drive oil level - check/fill	. 5-60
5.8.8.10 Final drive oil level - check/fill	. 5-61
5.8.8.10 Final drive oil level - check/fill	. 5-62
5.8.9.1 General	. 5-62
5.8.9.2 Hydraulic oil suction filter element - replace	. 5-62
5.8.9.3 Swing drive oil - change	. 5-63
5.8.9.4 Cab door lock and front window lock catch - inspect/tighten	. 5-65
5.8.9.5 Cab door hinge and front window slide rail - inspect/add grease	. 5-66
5.8.9.6 Windshield wiper arm nut - Inspect/tighten	
5.8.9.7 Engine exhaust pipe clamps - check	. 5-67
5.8.9.8 Fan belt tension - check/replace	. 5-67
5.8.9.9 Nitrogen pressure in accumulator (breaker) - check	
5.8.9.10 Fan belt tension - check/replace	. 5-68
5.8.9.11 Nitrogen pressure in accumulator (breaker) - check	
5.8.9.12 Swing mechanism grease - check and add	
5.8.9.13 Hydraulic tank breather valve filter element- replace	. 5-69
5.8.10 Every 2000 service hours	
5.8.10.1 General	
5.8.10.2 Final drive oil - change	. 5-70

	- 69
5.8.10.3 Hydraulic oil suction filter element – clean/replace	
5.8.10.4 Nitrogen pressure in accumulator (control oil circuit) - ch	neck 5-72
5.8.10.5 Cooling system interior clean	5-75
5.8.10.6 Alternator - inspect	5-77
5.8.10.7 Engine valve clearance - check/adjust	
5.8.11 Every 4000 service hours	5-78
5.8.11.1 General	5-78
5.8.11.2 Water pump - inspect	5-78
5.8.11.3 Start motor - check	5-78
5.8.11.4 Accumulator - replace	5-78
5.8.11.5 High-pressure tube clamps and rubber - check	5-80
5.8.11.6 Compressor working condition - inspect	
5.8.11.7 Hydraulic tank oil - change	5-81
5.8.12 Every 8000 service hours	5-82
5.8.12.1 Maintenance after every 8000 h	5-82
5.8.12.2 High-pressure tube clamps - replace	
5.8.12.3 Maintenance after every 10000 h	5-82
5.8.12.4 Maintenance during long-term storage	

d. federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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

d federico 2022-09

d_federico 2022-09-06 5.1 Maintenance Information 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.

Genuine Sany lubricants

3derico 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 jederico 2022-0 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.

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.

- d.federico 2022-09-06 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.

- 2022-09-06 When inspecting the machine or changing the oil, park the 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 derico 3055-09-06 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 removed 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
- Do not twist or bend the hydraulic hoses when assembling. Failure to do so could cause damage to the hoses and considerably reduce their service life d federice

After inspection and maintenance

If no checks have been made after inspection and maintenance, unexpected failure may occur, d federico 21 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 2-70.
- 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.
- 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 federico 2022-09-06 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 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 the 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 tog
- Contact your Sany dealer when the oil in your work equipment has been contaminated by water or air.
- To know the condition of the machine, regular oil quality analysis is recommended. Contact your 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 hydraulic oil. A small amount of different residualis accordable. d federico?

5.2.2 Fuel

- 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.
- The air in fuel path must be eliminated in case that the engine runs out of fuel or the filter cartridge has been replaced. tederico 2
- 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 de-
- 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 the machine 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.
- Sulfur content in fuel generates sulfur oxide in combustion, which reacts with water and produces dilute sulphuric acid that will impair the engine. To prevent such fault, always use a fuel whose 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-135 antifreeze has excellent performance in anticorrosion, antifreezing 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

Min. temperature	°C	-10	-15	-20	-25	-30	-35	-40
	°F	14	5	-4	-13	-22	-31	-40
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.

5.2.4 Grease

- 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.
- 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

5.2.5.1 General

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

5.2.5.2 Filter element

- letico 2022-09-06 erico 2022-09-06 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 replaced 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 your Sany dealer if metal particles are found.
- Do not open the package of a spare element when it is in storage.
- Use genuine Sany elements.

5.2.6 Electrical system

- ico 2022-09-06 202022-09-06 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 the 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 your Sany dealer before installing radio receiver or other wireless devices.
- Operating on beach requires cleaning the electrical system thoroughly in order to prevent corrosion.
- d_federico 2022-09-06 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. d federico 21

5.3 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.

Item	Part name	Quantity	Replacement Interval
-06	Coarse filter element	1	Every 500 h
23-09-00	Fine filter element	02-09	Every 500 h
Power 2012	Air cleaner secondary element	1	When the main filter is replaced 3 times, the safety filter element is replaced once.



00-06		00-06	20-0
Item	Part name	Quantity	Replacement Interval
federico s	Air cleaner primary element	1	Purge for 6 times or replace every 1000 h
	Engine oil filter element	1	After initial 50-hour, every 500 h
Hydraulic	Suction filter	1	Check and clean every 2000 h and replace in the case of damage (check and clean every 1000 h and replace in the case of damage)
09-06	Oil return filter	09-061	Every 2000 h
federico 2022-09-06	Hydraulic oil filter	1	Every 500 h
* ederico	Breather valve	1	Every 1500 h
	Fresh air filter	1	Clean every 500 h, replace every six months, and shorten the cleaning interval in dusty areas.
A/C	Recirculation filter	1	Clean every 500 h, replace every six months, and shorten the cleaning interval in dusty areas.
federico 2022-09-06 Earthmoving bucket	Horizontal pin type bucket teeth Bucket teeth (Pin)	-09-065	d. federico 2022-09-
:02021	Bucket teeth	5	:602021
Earthmoving bucket	(Pin)	(5)	tederios
Earthmoving bucket	Left blue teeth	1	97.—
	Right side teeth	1	
	(Bolt)	(8)	
	(Nut)	(8)	

Note: Parts in brackets shall be replaced at the same time.

5.4 Recommended Fuel, Coolant and Lubricant

5.4.1 General

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

30-06	20.06	30-06
tem	Туре	2022-09
Engine Oil Pan	Caltex CI-4 15W-30	derico
Swing Drive	Gear oil 85W/140	y
Final Drive	Geal oil 65W/140	
Hydraulic System	Caltex HDZ46	
Radiator	TEEC-L35 antifreeze	

- To keep the 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 overwear and service life reduction of the engine, power train, cooling system and other components.
- The additives available in market could benefit the machine, but they could impair the machine
- 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 lines.
- * The use of multigrade 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.

d federico 2022-09-06

d.federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

9

9

9

5.4.2 Table of recommended fuel, oil and coolant

	06					9-06				2022-09
4.2 Table of		nde	d fuel, oil	and c						2021
rico			1.00	ekico.	Enviro	amontal t	emperatu	iro .	istico	
Vessel	Liquid	-22	4/20	14	32	50	68		<u> </u>	22 °F
	type	-30	-20	-10	0	10	20			50°C
							0.4.5.00			
							SAE 30			
				SAE	10W					
Engine oil pan						 SAE 10W-	20			
	Engine oil					DAE TUVV-	30			
						SAE	15W-40			
Carrier roller	_									
Idler	00					SAE 30				
Track roller					200	3 0514	1/4.40			2022-09
Swing gearbox Traveling	Gear oil			07	O'L-Ge	ar oil 85W	//140		0	10.70
gearbox	0001 011			erico					SLICO	
			9 160	r		CAE 40V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	9.480		
						SAE 10V	V			
	Engine oil				5	SAE 10W-	30			
						SAE 15W-	40			
Hydraulic						DAL 1300-	40			
system			1107001	4		_				
•			HDZ32 I anti-we		nperatur aulic oil	е				
	Hydraulic									
	oil				H	IDZ46 Ant	i-wear hyd	draulic oil		
- 0	06					JH OO_	DZ68 Anti-	wear hydrau	ulic oil	-0
25-05)				000	0				23-00
:: 020				:.007	702	GB252	2 premium	No.0 diese	0.00	100
SLIC			503	ELIA				d jed	SU	
rico 2022-09			died		GB252 premiur			9-10		
					o20 di					
Fuel tank	Diesel									
			GB: Premiun							
			Die							
	Lade 2 C									
Grease fitting	Lubricating grease				1	NLGI	No.2		I	
Cooling										
system	Coolant					TEEC-L3	5			-02:00

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.



d_federico 2022-09-06

d_federico 2022-09-06

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

Light diesel oil (GB252.81)

CAUTION

 Use low sulfur fuel with a cloud point of at least 10°C below the minimum desired fuel temperature. Cloud point means the temperature at which the waxy crystals in the diesel begin to form.

-09-06

- Commercially available brands of diesel used shall have the sulfur content of less than 0.2%.
- If the diesel with sulfur content higher than 0.2% is used, the oil change interval of engine oil pan shall be shortened appropriately as follows:

Sulfur content of fuel	Oil change interval of engine oil pan
0.2 ~ 0.5%	1/2 of standard interval
0.5 ~ 1.0%	1/4 of standard interval

Keep the fuel clean and free of moisture or foreign matters when refueling; for the fuel with relatively much moisture and foreign matters, the change cycle shall be shortened according to the actual blockage condition of the filter element.

3. Hydraulic oil

The hydraulic system uses Caltex HDZ46 hydraulic oil (code B420106000036).

d federico 2022-09-06

d. federico 2022-09-06

A CAUTION

When operating at low ambient temperatures below 0°C, the following temperature-raising operations must be performed to ensure the safety of the hydraulic system:

- Start the engine and let it idle for 7 to 10 minutes and then increase the speed to 1000 to 1200 r/min. Do not perform any operation on the excavator, and allow it to run for 30 to 40 minutes or more under no load in order to increase the hydraulic oil temperature to 20°C or more.
- After the above temperature-raising operations are completed, normal construction works can be performed, and the temperature-raising time shall be appropriately adjusted according to the ambient temperature. When normal construction works start, the handle and the foot valve shall be slowly operated, and close attention shall be paid to the operation conditions of the system. Working at the hydraulic oil temperature below 20° C may damage the hydraulic components.
- Select the appropriate hydraulic oil according to the working area where the machine is located. Before the machine leaves the factory, our company is responsible for filling it with the appropriate grade of hydraulic oil. After the machine leaves the factory, the user is responsible for changing the oil. The user may consult our company's after-sales service personnel to obtain the correct hydraulic oil specifications and brands

5.4.3 Table of capacities

	Model		Engine oil pan	Swing drive casing	Final drive casing	Hydraulic system	Cooling system	Fuel tank
SY205C9	Specified	L	22	4.0	5.5	239	22.5	340
SY215C9	capacity	US gal	5.83	1.06	1.45	63.14	5.94	89.8
SY235C9	Specified	L	24.5	4.0 200	5.5	239	20	340
3064,20000	capacity	US gal	6.49	(e ^{de} 1.06	1.45	63.14	5.28	89.8

5.5 General

NOTICE

- Nuts, bolts or other parts not tightened to specifice torque values may lead to loose o damaged parts, resulting in machine failure and operating troubles.
- Special attention shall be paid when tightening parts. d federico 2022-09-06







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.

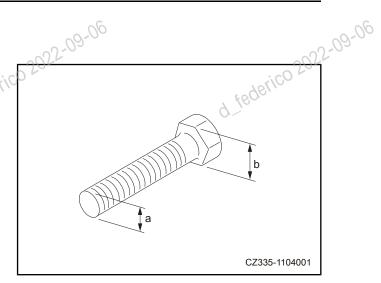


Fig.5-1

	09-1	6 Fig.5-1					
Thread	Square		Tightening Torques				
Diameter	Size b	Ta	Target Values T		Torque Limits	4erico	
a (mm)	(mm)	N·m	kgf· m	lbft	N·m	kgf· m	Ibft
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	177	18	130.2	157~196	16.0~20.0	115.7~144.7
16	24	279	28.5	206.1	245~309	25.0~31.5	180.8~227.8
18	27	382	39	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	32/9	745	76	549.7	662~829	67.5~84.5	488.2~611.2
24	20 36	927	94.5	683.5	824~1030	84.0~105.0	607.6~759.5
27/100	41	1320	135	976.5	1180~1470	120.0~150.0	868.0~1085.0
30	46	1720	175	1265.8	1520~1910	155.0~195.0	1121.1~1410.4
33	50	2210	225	1627.4	1960~2450	200.0~250.0	1446.6~1808.3
36	55	2750	280	2025.2	2450~3040	250.0~310.0	1808.3~2242.2
39	60	3280	335	2423.1	2890~3630	295.0~370.0	2133.7~2676.2
42	65	4700	480	3478	4250~5150	434.0~525.0	3145~3811

d_federico 2022-09-06



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

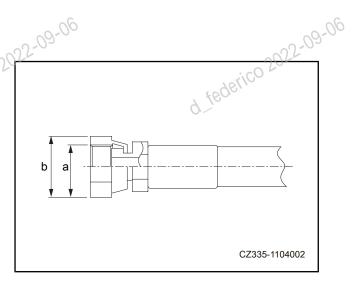


Fig.5-2

N; 60 -1 Thursd	Square Size	Tightening Torques					:02022-0
Nominal Thread Number (a)		Target Values			Permissible Range		
Number (a)	(b) (mm)	N·m ^d	kgf∙ m	lbft	N·m	kgf· m	lbft
9/16-18UNF	19	44	4.5	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
*1 -7/16 - 12UN - 2B	41	215	22.0	159.1	176~234	18.0~24.0	130.2~180.8
lote: The item m	arked with * i	s used fo	or tighteni	ing the ho	se on top of t	he swivel joir	nt. Herico 2022-0

Note: The item marked with * is used for tightening the hose on top of the swivel joint. d federico 2022: d federico 2022

d_federico 2022-09-06

d_federico 2022-09-06

5.6 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 fi re prevention.
- Safety critical parts may easily wear or deteriorate due to material change as time tions through regular maintenance. These parts shall be replaced as scheduled regardless of their conditions, which can effectively guarantee the functions of these parts.
- 100 2022-09-06 co 2022-09-06 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.
 - d federico 2022-09-06 passes and it is hard to judge their condi- . Consult your Sany dealer to replace the safety critical parts.

No.	Safety critical parts for periodic replacement	Quantity	Frequency
1	Fuel hose (fuel tank - primary fi lter)	1	
2	Fuel return hose (engine - fuel tank)	1	
3	Fuel hose (primary fi lter - engine)	1	
4	Pump outlet hose (pump - control valve)	2	
5	Work equipment hose (boom cylinder oil inlet)	4	03.09.
6eric	Work equipment hose (Bucket cylinder line - boom root)	2	Every 2 years or
7	Work equipment hose (bucket cylinder oil inlet)	2	4000 hours,
8	Work equipment hose (arm cylinder line - boom root)	2	whichever occurs
9	Work equipment hose (arm cylinder oil inlet)	2	first.
10	Swing drive hose (swing motor oil inlet)	2	
11	Main oil suction hose	1	
12	Travel control hose (control valve - swivel joint)	4	
13	Travel control hose (swivel joint - travel motor)	4	
14	Pump pressure hose	1	0.09
15	Accumulator (control oil)	1	7055-09.
16/10	High-pressure tube clamps	1	Every 8000
17	Cover - fuel squirt prevention	1	hours
18	Seat belt	1	Every 3 years

5.7 Maintenance Schedule

If the 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" on page 8-15.

Maintenance schedule list

Initial 50 hours of operation	5-20
Initial 500 hours of operation	5-21
Swing drive oil - change	5-21
Final drive oil - change When Required Track shoe bolts - inspect/tighten	5-22
When Required	5-23
Track shoe bolts - inspect/tighten	5-23
Track tension - inspect/adjust	
Bucket - replace	5-27
Bucket tips - replace	5-30
Bucket clearance - adjust	5-32
Window washer fluid level - check/fill	5-34
Refrigerant level - check Ceiling window gas spring - inspect	5-35
Ceiling window gas spring - inspect	5-37
Inspection Prior to Startup	5-39
Every 100 service hours	
Lubrication	5-40
Every 250 service hours	5-43
Air filter element - inspect/clean/replace	5-43
Fan belt tension - inspect/adjust	5-46
Compressor belt tension - inspect/adjust	
Oil return check valve - check	5-48
Pipe clamps of hydraulic system - check	

00.06	30,00
Every 500 service hours	5-50
Every 500 service hours	5-50
Engine pan oil and filter element - change/replace	5-51
Swing pinion gear grease level - inspect/fill	5-53
Primary fuel filter element - replace	5-54
Secondary fuel filter element - replace	5-57
Prmiming pump strainer - Clean	5-60
Radiator and oil cooler fins - inspect/clean	5-61
Air conditioner fresh air/recirculation filter - clean	5-63
Radiator and oil cooler fins - inspect/clean Air conditioner fresh air/recirculation filter - clean Swing drive oil level - check/fill	5-65
Final drive oil level - check/fill	
Every 1000 service hours	5-67
Hydraulic oil suction filter element - replace	5-67
Swing drive oil - change	5-69
Cab door lock and front window lock catch - inspect/tighten	
Cab door hinge and front window slide rail - inspect/add grease	5-71
Windshield wiper arm nut - Inspect/tighten	5-71 5-72 5-72
Windshield wiper arm nut - Inspect/tighten Engine exhaust pipe clamps - check	5-72
Fan belt tension - check/replace	5-72
Nitrogen pressure in accumulator (breaker) - check	5-72
Fan belt tension - check/replace	5-73
Nitrogen pressure in accumulator (breaker) - check	5-73
Swing mechanism grease - check and add	5-73
Hydraulic tank breather valve filter element- replace	5-74
Hydraulic tank breather valve filter element- replace Every 2000 service hours Final drive oil - change	5-75
Final drive oil - change	5-75
Hydraulic oil suction filter element – clean/replace	5-77

	Nitrogen pressure in accumulator (control oil circuit) - check	5-78
d fe	Nitrogen pressure in accumulator (control oil circuit) - check	6:rico 5-82
	Alternator - inspect	5-84
	Engine valve clearance - check/adjust	5-84
	Every 4000 service hours	5-85
	Water pump - inspect	5-85
	Start motor - check	5-85
	Hydraulic tank oil Change	5-86
	Hydraulic tank oil - change Accumulator - replace High-pressure tube clamps and rubber - check	5-88
7 5	High-pressure tube clamps and rubber - check	<u>1908</u> 5-89
0.7	Compressor working condition - inspect	5-90
	Every 8000 service hours	5-90
	High-pressure tube clamps - replace	5-90
	Every 10000 service hours	5-90

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

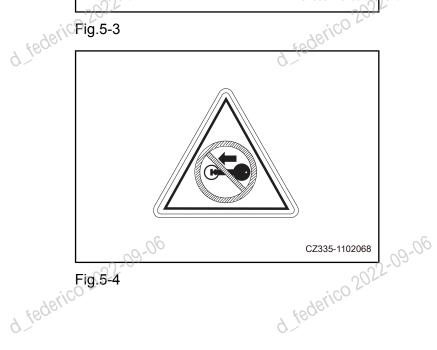
d_federico 2022-09-06

5.8 Maintenance Procedures

5.8.1 Lockout and tag-out measures

- When maintenance is underway, starting the engine or moving the control levers or pedals could lead to serious accident.
- Prior to maintenance, attach a DO NOT OPERATE tag or similar sign to the machine's start switch or control levers to warn others that this machine is under maintenance.
- Attach other warning tags around the mad federico chine if necessary





federico 2022-09-06 5.8.2 Initial 50 hours of operation

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 d.federico 2022-09-06 d. federico 2022-09-06 500 service hours".

d_federico 2022-09-06

mours of operation 3.1 Swing drive oil - change

- 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.
- Swing drive casing capacity: 4.0 L (1.06 US) gal)
- 1. Place a container under the drain valve (P) to collect the gear oil drained.
 - 2. 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 inthe oil. However, the work equipment shall not be swups don't crease the oil temperature before draining otherwise damage the swing unit.
 - 3. Remove the filler cap (F) and add oil as required through the filler opening.
 - 4. Check the oil level. For more information, see "Swing drive oil level - check/fill" on page 5-65.
 - d.federico 2022-09-06 5. Apply sealant onto the thread of the filler opening and tighten the filler cap.

Tightening torque: 2.7N·m

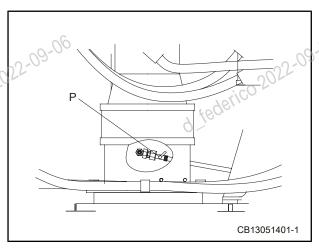


Fig.5-5

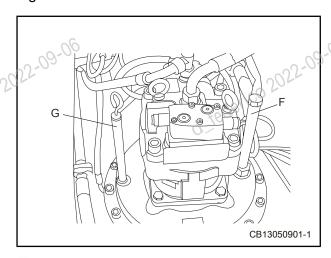


Fig.5-6



Improper tightening of the filler cap may cause the gear oil in the swing drive to leak

5.8 2 2 7 co 2022-09-06

5.8.3.2 Final drive oil - change

WARNING

- When the engine is shut down, the oil is still hot. Wait until the oil is cool enough before operation.
- derico 2022-09-06 Residual pressure in the tank can cause oil to squirt out or the screw plug to fly out. Slowly loosen the screw plug in order to release the pressure.
- When the screw plug is being loosened, do not stand in front of the screw plug.
- Refilling capacity: Refer to "Table of capacities" on page 5-14.
- 1. Park the machine on a hard and flat ground and adjust position so that the drain plug (D) is closest to the ground. Stop the engine and place the lockout lever to the LOCKED position.
- 2. Use a proper screwdriver to remove the dirt in the hexagonal socket of screw plug.
- 3. Place a container under the drain port (D) to collect the oil. Loosen the level port plug (L) and the drain port plug to discharge oil.
- 4. When the oil in the final drive is drained, clean the drain port plug with clear diesel fuel
- 5. Remove the fill port plug (F) and add specified gear oil through the filler opening flows out from the level port.





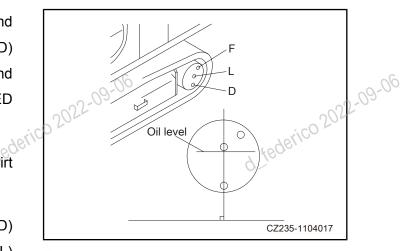


Fig.5-7



d_federico 2022-09-06

d_federico 2022-09-06 6. Clean the plug with clear diesel fuel and reinstall the plug.

NOTE:

Check the O-ring on screw plug and replace the O-ring if it is damaged.

5.8.4 When Required

5.8.4.1 Track shoe bolts - inspect/ tighten

d_federico 2022-09-06 If the machine is operated with loose track shoe bolts (1), the bolts can break. Tighten any loose bolts immediately

Tightening

Three-grouser track shoe

- 1. Tighten the bolts to torque values of 600 ~ 680N · m(61.2~69.4kg for 441~500lbft). Make sure that the nuts and track shoe are in close contact with the link mating surface.
- 2. Inspect and further tighten the bolts by 120 ± 10°.

Tightening sequence

Tighten the bolts in the sequence shown in the right illustration. After tightening, make sure that the nuts and track shoe are in close contact with the link mating surface.

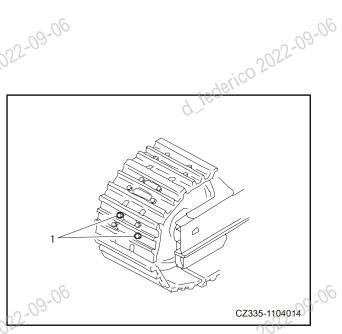


Fig.5-8

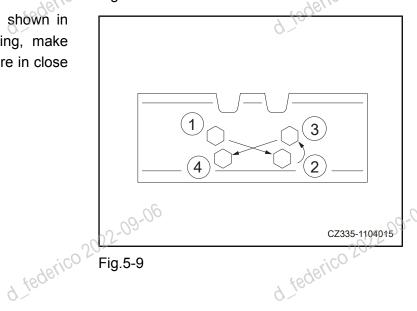


Fig.5-9



d_federico 2022-09-06

Wear of the undercarriage pins and bushings may vary with operating conditions and type. Therefore, the training officers often so as to maintain a proper track tension.

Park the machine on a hard and level ground before checking and adjusting track tension.

Track Tension Inspection

- 1. Run the engine at low idle speed. Travel the machine forward for a distance equivalent to the length of the track on the ground. Then, stop the machine slowly.
- 2. Place a straight piece of wood bar on top of the track grousers between the idler (1) and the carrier roller (2).
- 3. Measure the gap (a) between the bottom the wood bar and the top surface of the track grousers just below the bar.

Standard dimension of gap (a):

10~30mm (0.4~1.2in)

Adjustment

If track tension is beyond the standard range, adjust it as per the following procedures.

WARNING

- · When adjusting track tension, failure to observe maintenance procedures as specified may cause the grease discharge plug to eject and result in serious injury or death.
- Do not have your face, hands, feet and other body parts directly facing the grease discharge plug when adjusting track tension.

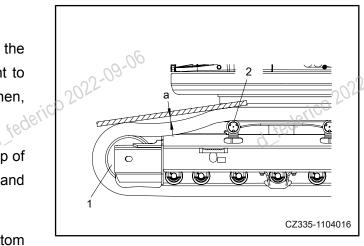


Fig.5-10

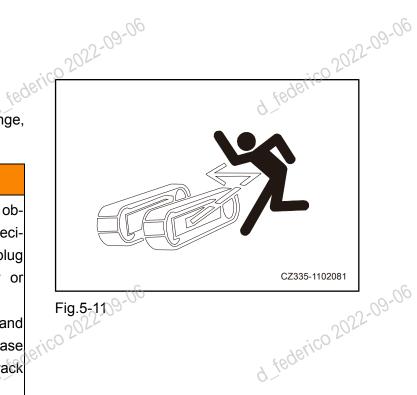


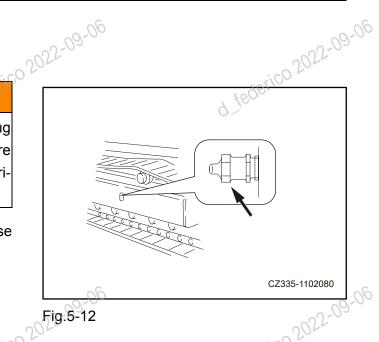
Fig.5-1100

Increasing track tension

WARNING

 Never loosen the grease discharge plug when increasing the track tension. Failure to follow this warning could result in serious injury or death.

To increase track tension, prepare a grease gun.



- 1. Inject grease through the grease fitting (2) with the grease gun. (The grease fitting (2) and the grease discharge plug (1) form an integral part.)
 - 2. Slowly travel the machine forward (7~8 m {23 ft~26 ft 3 in}) in order to check whether the track tension is suitable.
- 3. Check the track tension again. Make further adjustment if track tension is still beyond the standard range.
 - 4. Continue to add grease till the distance (S) becomes null (0). If the track is still loose, it is probably because the pin roll and bushing are overworn. In this case, the pin rolls or bushings must be swapped or replaced. Contact Sany dealer for repair.

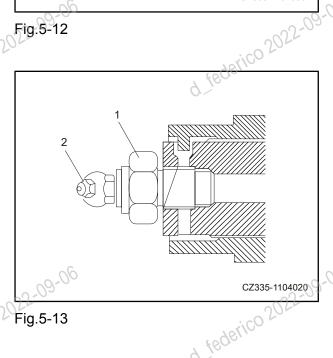


Fig.5-13

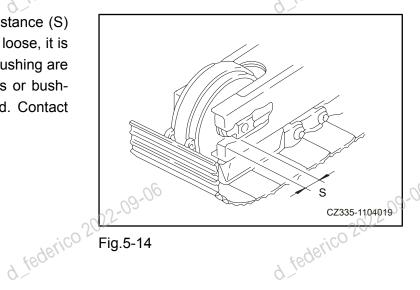


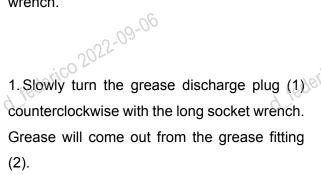
Fig.5-14

Reducing track tension

WARNING

- The grease discharge plug may shoot out under high pressure. Never loosen the plug more than one turn.
- · Do not loosen any other components except the grease discharge plug.

To reduce track tension, prepare a long socket wrench.



Do not loosen the plug (1) more than one turn.

- 2. If the grease does not come out smoothly, travel the machine back and forth for a short distance.
- 3. When suitable track tension is obtained. tighten the discharge plug (1).
- To check whether proper track tension is achieved, run the engine at low idle speed, travel the machine forward (for a distance that is equivalent to the length of the track on the ground), and then stop the machine.
- 4. Check the track tension again. Make further adjustment if track tension is still beyond the standard range. 2-09-06

NOTE:

through the above procedures, contact your Sany dealer for repairs. If the track tension can not be reduced

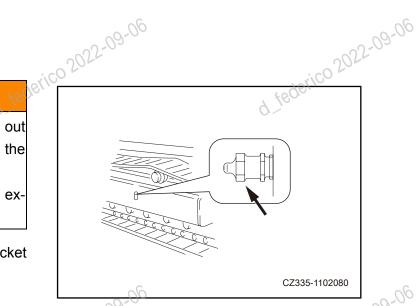


Fig.5-15

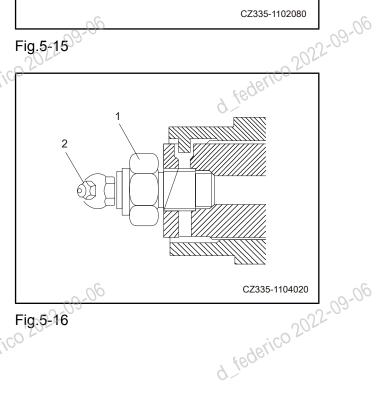


Fig.5-16



d_federico 2022-09-06

d_federico 2022-09-06

5.8.4.3 Bucket - replace

WARNING

- federico 2022-09-06 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. Make sure that the surrounding area is clear of people before doing the job.
- 0 2022-09-06 Do not stand behind the bucket when removing the pin shaft. Do not place your foot under the bucket when working at one side.
- Do not get your finger pinched while removing or installing the pin shaft.

Replacement

1. Park the machine on a hard and level ground and lower the bucket onto the ground. d. federico 2022-09-06

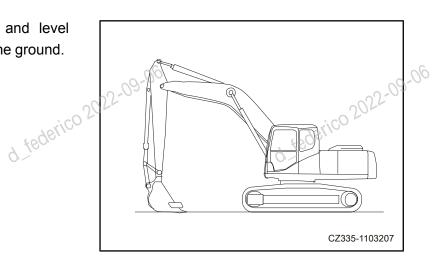


Fig.5-17

d_federico 2022-09-06

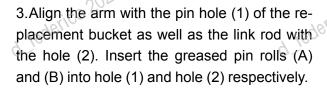
d. federico 2022-09-06



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), and then remove the bucket.

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 damage them.



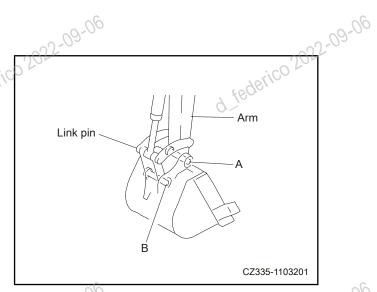


Fig.5-18

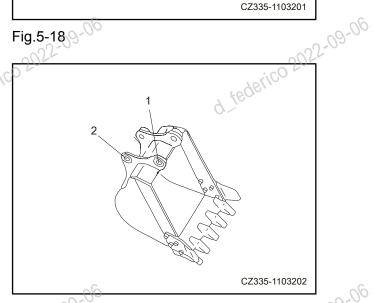


Fig.5-19

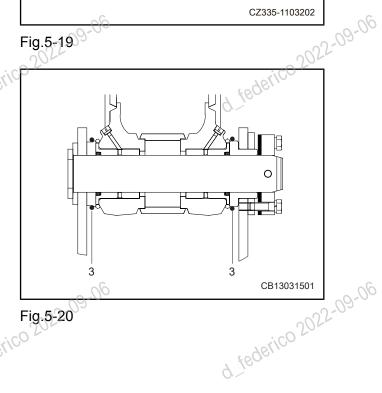


Fig.5-20

NOTE: 100 2022-09-06 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 retaining the pin rolls. Add grease to the pin rolls.

NOTE:

- Inject sufficient amount of grease till the grease is squeezed out of the end face.
- Replace any broken seals when replacing a bucket. The use of broken seals could allow

d_federico 2022-09-06

d_federico 2022-09-06 sand or dust to penetrate through to the pin roll and cause its abnormal wear.

5.8.4.4 Bucket tips - replace

Replace the bucket tip before the tip adapter is worn.

CAUTION

- Operating the work equipment by mistake is very dangerous when replacing bucket 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.

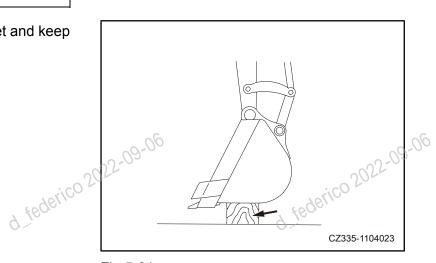


Fig.5-21

,02022-09-06

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

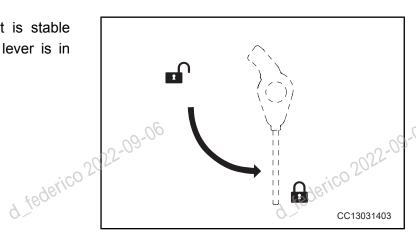


Fig.5-22

d_federico 2022-09-06

3. Place a metal stick against one end of the pin (1) and hammer the metal stick in order 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 your Sany dealer replacement.
- 4. Remove the tip and check the retainer for any damage. Replace it if necessary. The retainers and tips worn short must be replaced 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 order to lock the bucket tip onto its adapter. ico 2022-09-06

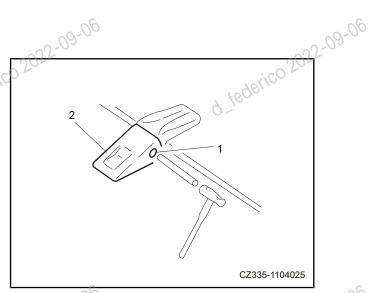


Fig.5-23

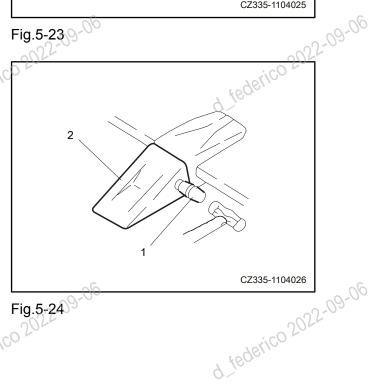


Fig.5-24 d federico 20

5.8.4.5 Bucket clearance - adjust

CAUTION

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

riod of time. When the clearance is excessively large or small, it is necessary to interpret or remove the shime.



- 1. Park the machine on a level ground. Lower the bucket to the ground in an attack. 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.
- 3. Shut off the engine. Place the lockout control lever to the LOCKED position.
- 4 Move the O-ring (1) and measure the clearance (a). It is easy to obtain accurate result 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 remove 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. d federico 2022-09-06

7. Tighten the four bolts (2). d federico 2022

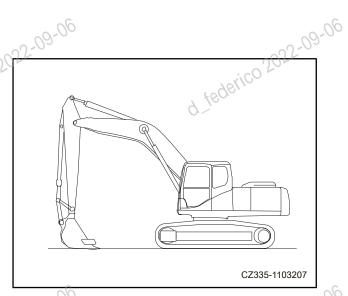


Fig.5-25

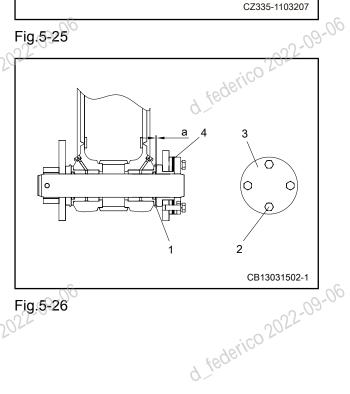


Fig.5-26





5.8.4.6 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.
- Fig.5-27

 3. Press the washer switch and check the function of the winds. function of the windshield washer.

NOTE: Be careful not to allow dirt or dust get into the reservoir when adding washer solvent.

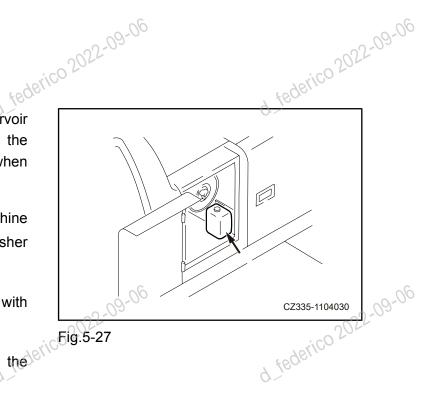
Mixing ratio of pure washer solvent and water

perico 2022-09-06 Select different mixture ratio according to ambient temperature. Mix pure washer solvent and water according the ratios listed below.

Operating Regions	Mixture Ratio	Temperature
General	1:2	- 10°C (14°F)
Cold regions in winter	1:1	- 20°C (- 4°F)
Extremely cold regions in winter	Pure wash- er solvent	- 30°C (- 22°F)

Table 5-9

(common) and one for -30°C {-22°F} (frigid regions), which can be selected according to the operating region. ing to the operating region.







5.8.4.7 Refrigerant level - check

WARNING

- Refrigerant getting into eyes may cause blindness. It may cause frostbite if splashed on your skin.
- Keep any naked fire away from the leaking position of refrigerant gas.

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 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.

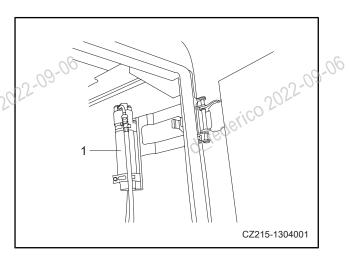


Fig.5-28

rico 2022-09-06

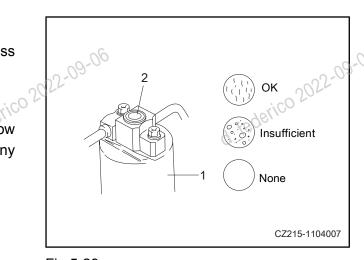


Fig.5-29

Inspection during idle period

When the air conditioner will not be used for a long period of time, the air conditioner shall be operd federico 2022 ated for 3-4 minutes each month in order to lubricate the compressor components.

Air conditioner components inspection and maintenance schedule



09-00	0.09-00	
Components	Description	Service Interval
Refrigerant (gas)	Re filling derice	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	Loose and bent	Every 250 hours
	Deterioration, wear, scratch and cracking	Every 250 hours
09-06	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
Table 5-10	s spring -	d federico 202
5.8.4.8 Ceiling window ga inspect	s spring -	1 federico

5.8.4.8 Ceiling window gas spring inspect

WARNING

- The gas spring contains highly-pressurized nitrogen. Wrong operation can cause explosion and result in machine damage and personal injury or death.
- Keep the gas spring away from naked fire.
- Do not drill or weld on the gas spring.
- d federico 2022-09-06 Do not hammer the gas spring or expose it under any impact. d federico

The gas springs are located on top of the cab (at both the left and right sides).

Contact your Sany dealer for income.

pair and replacement when

- The ceiling window cannot be opened easily; or when
- Oil or gas leaks from the gas spring.

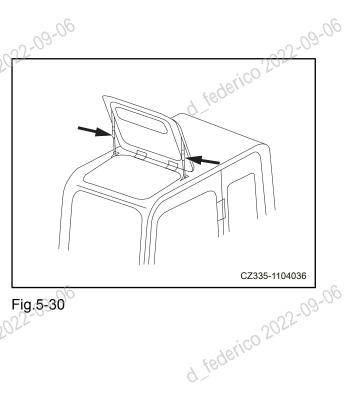


Fig.5-30

02022-09-06

How to release pressure in the hydraulic circuit

WARNING

- The hydraulic circuit is always under pressure. Relieve the pressure in hydraulic circuit when checking or replacing the hoses or fittings.
- When the engine is stopped, oil and engine components are still hot and can cause serious burns. Wait until they have cooled down before operating.
- Oil may squirt out when removing the oil filler cap. Therefore, slowly remove the cap in order to release the internal pressure.
- 1. Park the machine on a hard, level ground.

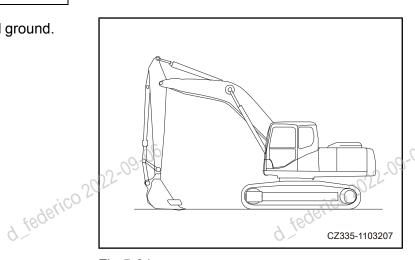
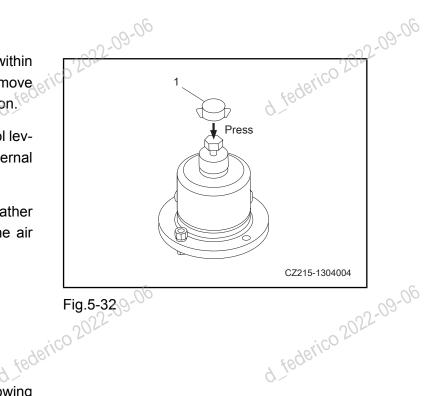


Fig.5-31



d.federico 2022-09-06

- 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.



60 5055-09-06 5.8.5 Inspection Prior to Startup

For more information about the following items, see "Inspection before starting" on page 4-7.

- 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 engine oil pand Add oil.
 Check the wires

- · Check the fuel level. Add fuel.
- Check the work lamp switch.
- Check the function of the horn.
- Air vent pipe under the engine. (This item shall be checked all the time when the machine is operating in muddy places) d federico 2022-09-06 d. federico 2022-09-06

d_federico 2022-09-06

5.8.6 Every 100 service hours

5.8.6.1 Lubrication

d federico 2022-09-06 **NOTICE**

- If the lubricated components produce abnormal noise, additional lubrication is required besides regular maintenance.
- After operating in wate r, 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.

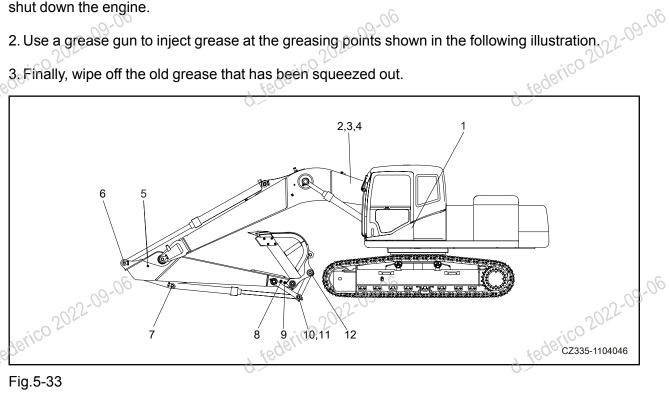


Fig.5-33

(1) Boom cylinder root pin (2 points)

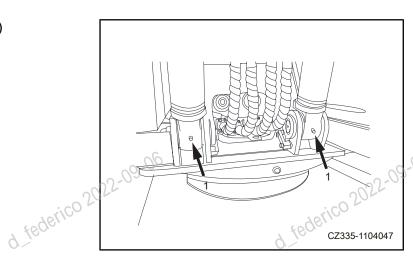


Fig.5-34



- (2) Boom root pin (2 points)
- (3) Boom cylinder piston rod end (2 points)
- (4) Arm cylinder root pin (1 point)

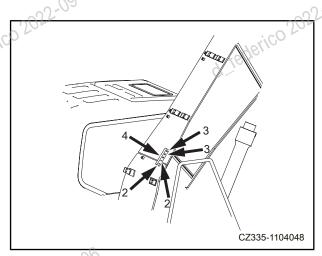


Fig.5-35

(5) Boom-arm joining pin (2 points)

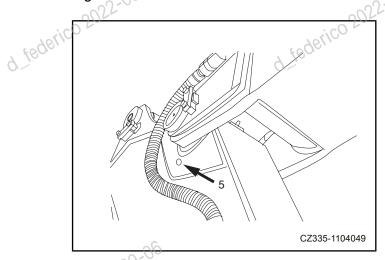
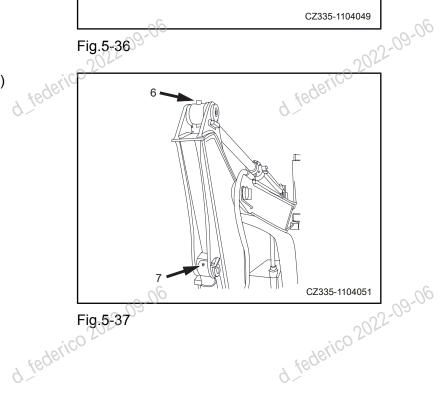


Fig.5-36

- 2022-09-06 (6) Arm cylinder piston rod end (1 point)
- (7) Bucket cylinder root pin (1 point)



- (8) Bucket-rod joining pin (1 point)
- (9) Arm-Bucket joining pin (1 point)

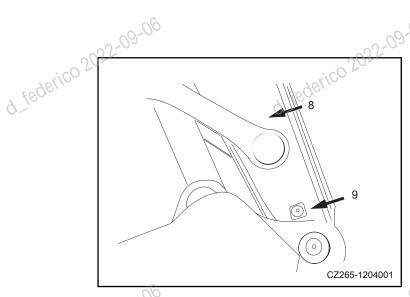
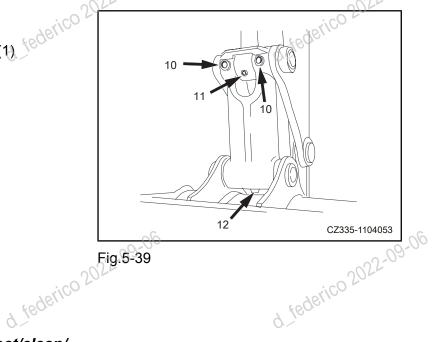


Fig.5-38

- (11) Bucket cylinder piston rod end (1)
 - (12) Bucket-rod joining pin (1)



rico 2022-09-06 5.8.7 Every 250 service hours

5.8.7.1 Air filter element - inspect/clean/ replace

A 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.
- d federico 2022-09-06 The sealing rubber of the end cap must be held tightly against the filter.



- Clean: Every 250 service hours or when the air cleaner clogging alarm appears
 Replace
- Every 1000 service hours or when it has been cleaned for six times, whichever occurs first.
- 1. Open the rear-left access cover of the machine and loosen the clip or clasp (1) before removing the cover (2). d federico 2022-1

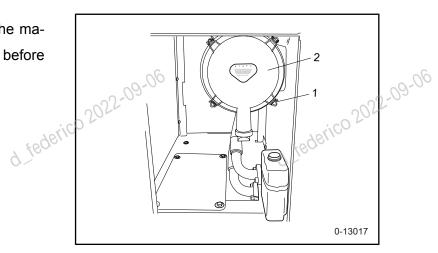


Fig.5-40

- 2. Hold the outer filter element (3), shake it slightly and turn it in both directions in order to pull it out.
- 3. Check the inner filter element (4) to see if it displaces or tilts. Push it back to position in case of displacement or tilting.
- 4. Cover the inner element (4) with a piece of clean cloth to avoid entering of dirt.
- 5. Clean the cover and clear the dust inside the housing (5).

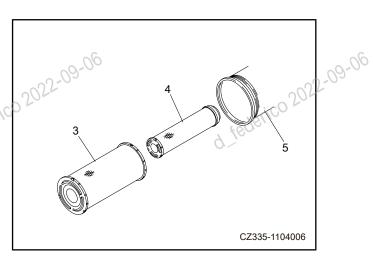


Fig.5-41

d federico 2022-09-06



6. Blow the outer filter element with compressed air (less than 0.2MPa) along the side and outside side and outside pleats.

Note:

- Do not tap the air filter element with any object when cleaning it.
- Do not use air filter elements with damaged 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.
- 7. Use a light to illuminate the filter element. Replace the filter element in case of holes or reduced thickness found in the filter material.

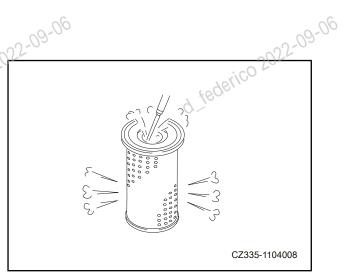


Fig.5-42

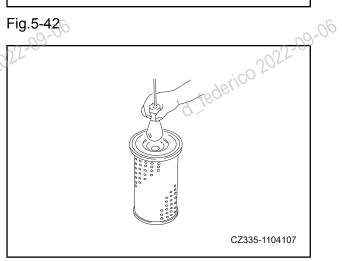


Fig.5-43

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

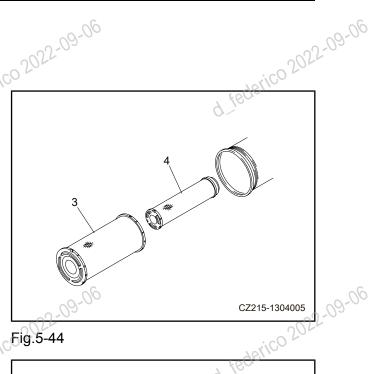
d_federico 2022-09-06

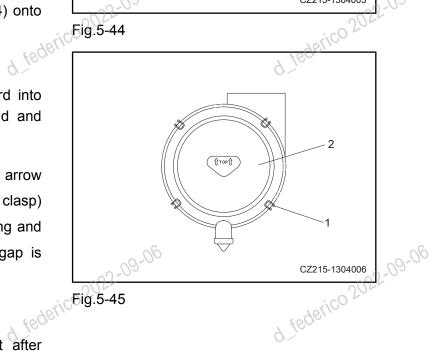


- 1. Remove the outer filter element (3) and then the inner filter element (4).
- 2. Cover both ends of the elements with a piece of clean cloth to prevent dust form entering the filter element.
- 3. Clean the inside of the air cleaner body and then remove the covering cloth.
- 4. Place the new inner filter element (4) onto the connecting side.
- 5. Install the outer filter element (3). Push the filter element straight forward into the air cleaner housing. You can hold and shake it 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: (100

- 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 fake parts shall not be used under any circumstances.







5.8.7.2 Fan belt tension - inspect/adjust

CAUTION

- Stop the engine before inspecting or adjusting fan belt tension.
- Over-tightened fan belt may cause damage to the belt itself or to the bearings.

Inspection

- 1. Press the middle section of the belt between the fan belt pulley and the alternator belt pulley with a force of about 98N {10kgf} with your finger.
- 2. Measure the deflection (A). Standard value of size A shall be 7~10mm {0.28~0.30in}.

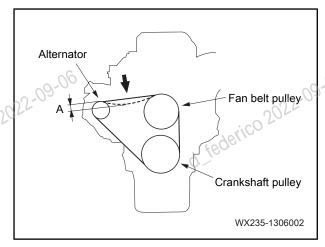


Fig.5-46

Adjustment

- 1. Loosen the mounting bolt (1) and adjusting nut (2).
- 2. Loosen the adjusting bolt (3) and adjust the belt tension of the alternator as specified. Then, tighten the mounting bolt (1) and the adjusting nut (2).
 - 3. Start and run the engine at low idle for about 5 minutes. Stop the engine and check belt tension once again.

The second check if especially necessary when a new belt is installed. Belt tension may d.federico 2022-09-06 change when a new belt seats into the belt d_federico 2022-09

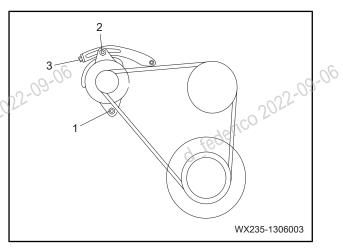


Fig.5-47



5.8.7.3 Compressor belt tension - inspect/adjust

Inspection

- 1. Press the middle of the belt between the drive pulley and the compressor pulley with your finger (about 58.8N {6kgf}).
- 2. Measure the deflection (A). Standard value of size A shall be 5-8mm {0.20-0.31in.}.

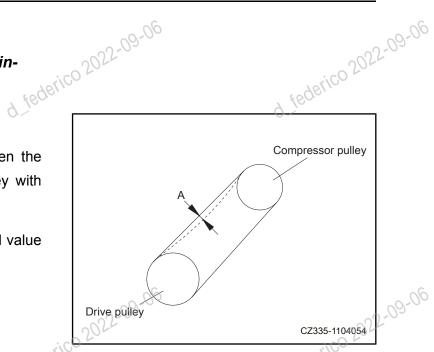


Fig.5-48

d. federico 2022-09-06 **Adjustment**

- 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).
- 4. Check again the belt tension after d federic adjustment.

Note:

- Check for damaged pulleys and worn Vgroove and V-belt. In addition, make sure that the V-belt must not rub against the bottom of the V-groove.
- Consult your Sany dealer to replace the belt timely in case of the following conditions.
 - The fan belt has been stretched and lit-
- A newly installed V-belt shall be readjusted after one hour of operation.

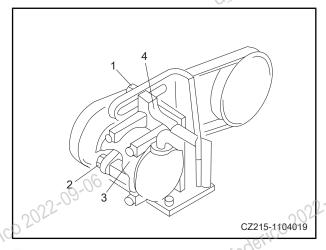


Fig.5-49

d_federico 2022-09-06

federico 2022-09-06 5.8.7.4 Pipe clamps of hydraulic system - check

- Check the hydraulic system for missing, deformed pipe clamps and loose bolts. Replace missing or deformed pipe clamps if any. Tighten loosened bolts to specified torques.
- Check if the hoops of the return oil hose and the T-clamp of the main pump suction d. federico 2022-09-06 hose are loose. Replace these hoops and clamps or tighten them to specified torques if necessary.

5.8.8 Every 500 service hours

5.8.8.1 Geberal

The 100- hour and 250-hour services shall be carried out in the meantime.

5.8.8.2 Swing bearing - lubricate

CAUTION

- 02022-09-06 Applying grease to the swing bearing is dangerous. Do not swing the upper structure when grease is being applied.
- 1. Lower the work equipment to the ground and then shut down the engine. Place the hydraulic 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 bucket 20-30 mm above the ground. Swing the upper structure by 90°.
 - 4. Repeat steps 1 through 3 and add grease.

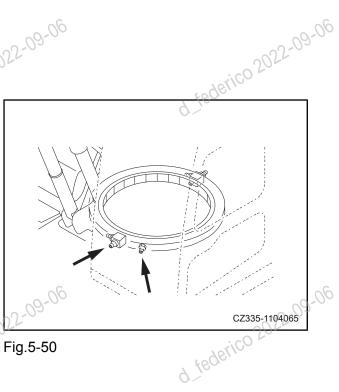


Fig.5-50



d_federico 2022-09-06

- The grease is used to prevent distortion and noise of joints.
 It is necessary ** 100 2022-09-06
- nent 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 5.8.8.3 Engine pan oil and filter element change/replace

change/replace

A CAUTION

- 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.
- For capacity of engine oil pan see "Table of capacities" on page 5-14.
- Prepare a filter wrench.
- 1. Park the machine on solid and level ground and lower the work equipment onto the ground.
- 2. Start and run the engine at low idle for 5 minutes.
- 3. Stop the machine and place the hydraulic lockout control to the LOCKED position.
- 4. Remove the bottom cover plate beneath the machine and place a container under the drain valve (P) to collect oil. Let the oil pass through a piece of clean cloth before the container.

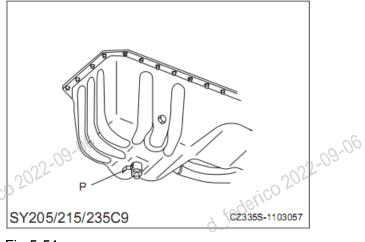


Fig.5-51

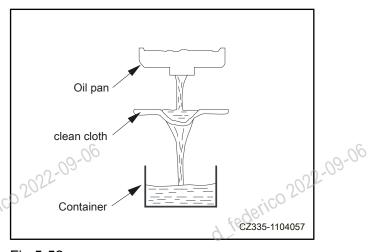


Fig.5-52



- body, slowly move the drain valve handle to discharge oil. Then move the handle discharge oil. Then move the handle back to close the drain valve.
 - 6. Open the right access door of the machine and turn the filter element (1) counterclockwise with the filter wrench to remove it.
 - 7. 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 before installing the filter element to its seat.

Remark:

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.

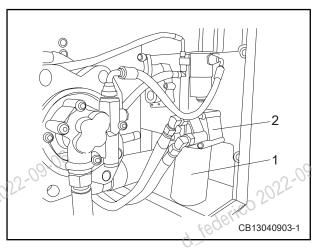


Fig.5-53

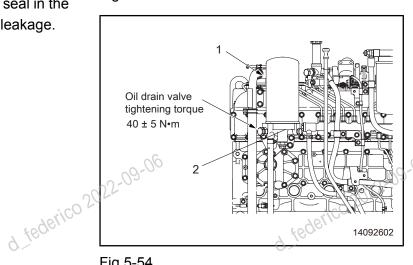


Fig.5-54

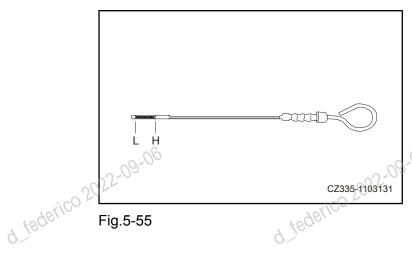


Fig.5-55





5.8.8.4 Swing pinion gear grease level inspect/fill

- Prepare a dipstick.
- 1. Remove the two bolts (1) from the swing frame. Remove the cover (2).

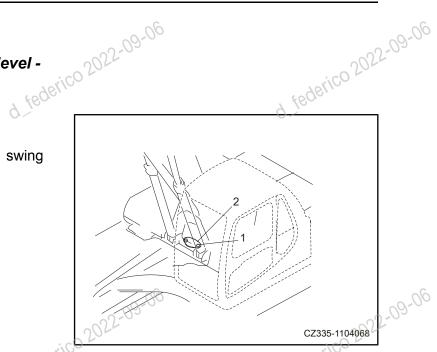


Fig.5-56

d_federico 2022-09-06 2. Put the dipstick (3) into the grease through the inspection hole. Check the grease level (S).

Height of S: 7 mm {0.3 in} at minimum

- 3. Check if the grease turns milk-white. Milkwhite grease indicates that the grease has been contaminated. Consult your Sany dealer in order to change the grease.
- 4. Use the bolts (1) to reinstall the cover (2). d federic

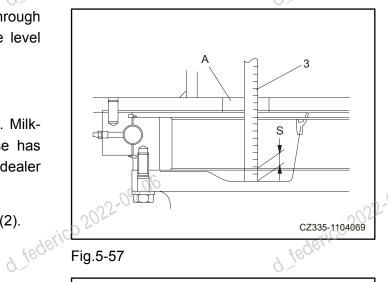


Fig.5-57

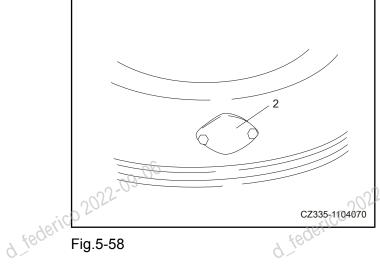


Fig.5-58

federico 2022-09-06 5.8.8.5 Primary fuel filter element replace

CAUTION

- 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.
- ederico 2022-09-06 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.
- d.federico 2022-09-06 2. Place a container under the primary fuel filter to collect the fuel drained. d federico 2022



Fig.5-59



2-09-06 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).

40Turn 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).
- 7. The sealing surface is to be oiled for installation. The sealing surface shall be in close contact with that of the filter element before further tightening it by 1/4-1/2 turn.

NOTE:

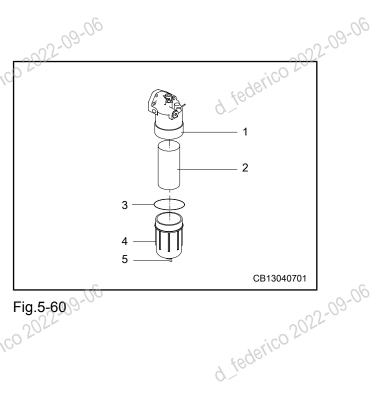
Overtightened transparent cover will damage the O-ring and cause oil leakage. Insufficient tightening will allow oil to leak from the clear-8. Bleed the air after replacement of the filter element (2).

dary fuel filter element - replace" on page 5-57.

9. After replacing the filter element, start and run the engine at low idle for 10 minutes.

federico 2022-09-06 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.

5.8.8.6 Secondary fuel filter element - replace

A CAUTION

- 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 hold the fuel drained.
 - Prepare a filter element spanner.

d_federico 2022-09-06

02022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

- 1. Open the engine hood.
- 2. Open the engine hood.
- 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.

Note:

- Do not fill the new filter cartridge with fuel.
- Remove the cover (B) and install the cartridge.
- 5. Replace the internal seal (2) with a new one.
- 6. 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.

7. Bleed filter the air after element replacement.

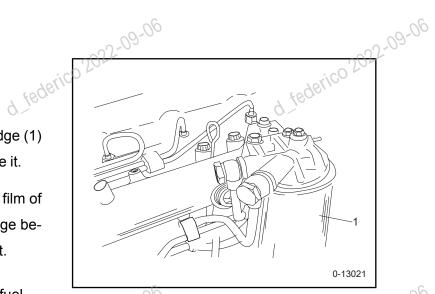


Fig.5-619

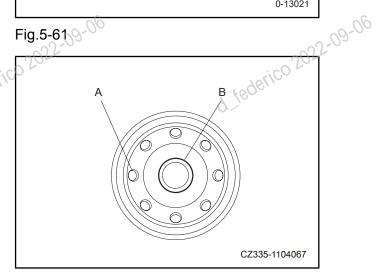
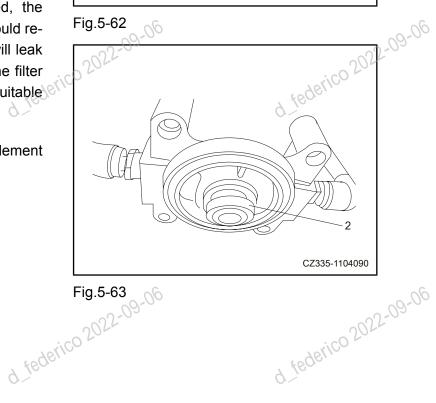


Fig.5-62



Air bleeding procedure:

- 8. Fill the fuel tank till the float reaches its maximum level.
 - 9.Loosen the plug (3) of the fuel filter.

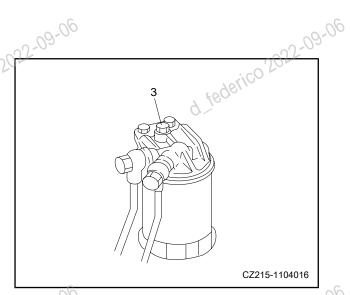


Fig.5-64

- 10. Pull out the handle (4) of the priming pump.
 - 11. Stroke the handle (4) of the priming pump to feed fuel.
 - 12. When no foams are observed in the fuel leaking from the plug (3) of the fuel filter, tighten the plug.

Tightening torque: 9.8 ± 2.0N·m {1.0 ±0.2kgf·m}

- 13. Stroke the priming pump five to six times and tighten the handle (4).
- 14. When air has been purged, clean the spilled fuel. Start and run the engine at low idle for 10 minutes.

Check for fuel leakage on the sealing surface of the filter cartridge. If fuel leaks, check if the cartridge is well tightened.

If fuel leakage does not stop, repeat steps 1 through 3 to remove the filter cartridge. If damage or foreign objects are found on the Fig.5-66 sealing surface, the cartridge with a new one and follow steps 4 through 13 to install it.

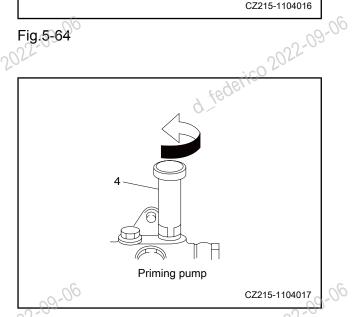
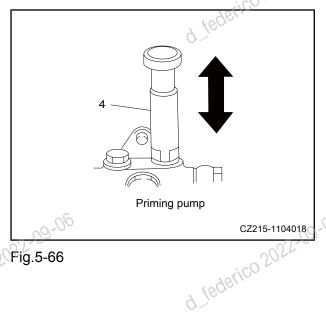


Fig.5-65





federico 2022-09-06 5.8.8.7 Radiator and oil cooler fins - inspect/clean

CAUTION

· Wear goggles, dust-proof mask or other gears personal protective when handling compressed air, water or steam.

NOTICE

- When compressed air is used for clean-
- The fins shall be inspected on a dail y when the machine is well. place.
- 1. Open the engine hood.
- 2. Open the left access door of the machine.
- 3. Loosen the wing bolts (1) and pull out the screen (2).
- 4. Clean the screens with compressed air (0.2MPa) or water.

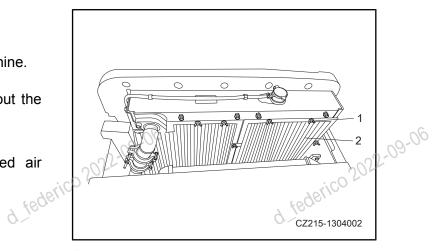


Fig.5-67

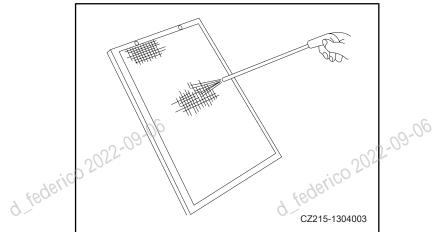


Fig.5-68









5. Inspect the radiator (3), the hydraulic oil cooler fins (4), the inter-cooler (5) the air scale ditions: ditioner condenser fins (6) and the fuel cooler (if equipped).

If mud, dust or leaves are found on these components, clean them with compressed air or water in the opposite direction of air flow.

NOTE: When high pressure water is used for flushing, lower the pressure of the spray gun and keep the gun about 30cm away from the radiator fins. When the spry gun is too close to the radiator, the fins may deform, resulting in premature plugging and cracking of the radiator.

NOTICE

- Do not try to pick dirt out of the fins using hard tools; otherwise, the radiato r fins may become damaged.
- 6. Check the radiator fins for deformation, holes or cracking after cleaning. Make repairs or replacement if necessary. Inspect the ho-
- TRemove the bottom cover (7). Remove the dirt, debris and tree leaves that have swept to the extern
- 8. Restore screen (2) that has been cleaned and secure them with wing bolt (1).
- 9. Install bottom cover (7) and lock the engine hood and the left access door.

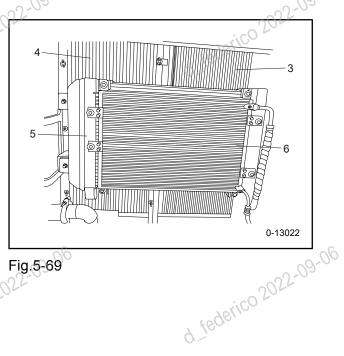
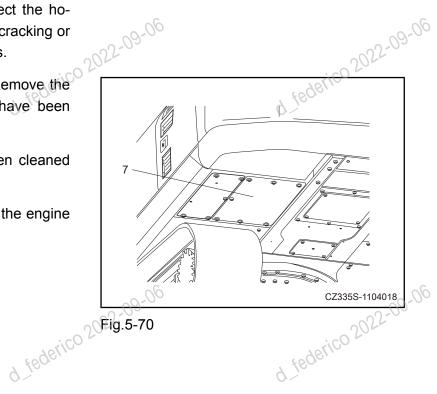


Fig.5-69



d_federico 2022-09-06

federico 2022-09-06 5.8.8.8 Air conditioner fresh air/recirculation filter - clean

CAUTION

 Wear goggles, dust-proof mask or other personal protective gears when handling compressed air, water or steam.

Note:

The filter shall be cleaned every 500 hours, d. federico 2022-09-06 but operating the 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.

Internal air filter - clean

- 1. Remove the screw (1) from the access cover in the rear of the cab, loosen the locking nut (2) and remove the internal air filter (3).
- 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.

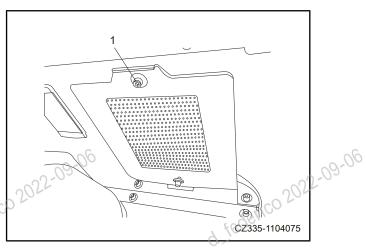


Fig.5-71

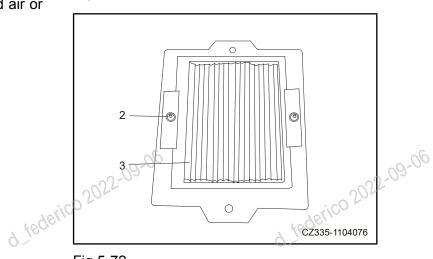


Fig.5-72



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.

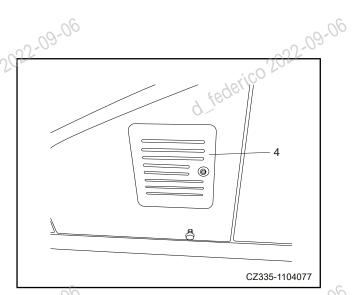


Fig.5-73

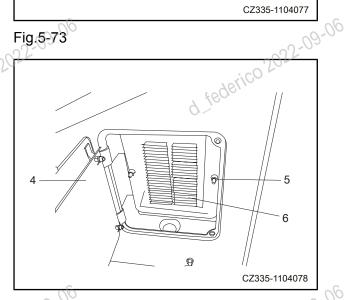
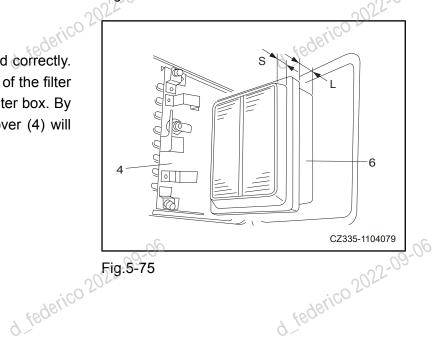


Fig.5-74



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.



5.8.8.9 Swing drive oil level - check/fill

CAUTION

- 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.
- 2. Insert the dipstick (G) back into the tube.
- 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.
- zrico 2022-09-06 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 your Sany dealer for inspection.
- Place a container under the drain valve before draining engine oil.
- 6. After checking the oil level or refilling the oil, insert the dipstick (G) into the tube and restore the filler cap (F). d federico 2

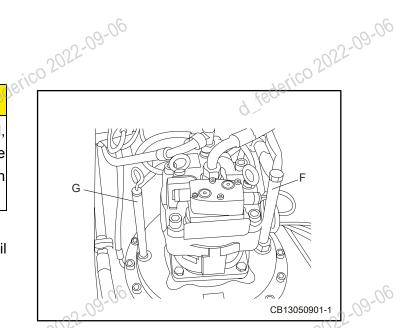


Fig.5-76

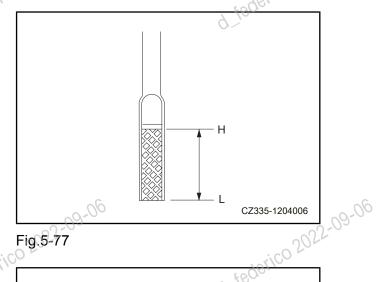
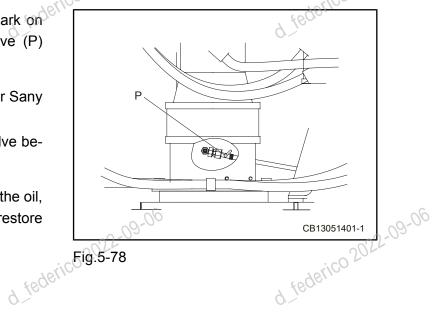


Fig.5-77



5.8.8.10 Final drive oil level - check/fill

WARNING

- When the engine is shut down, the oil is still hot. Wait until the oil is cool enough before operation.
- Residual pressure in the tank can cause oil to squirt out or the screw plug to fly out. Slowly loosen the screw plug in order to release the pressure.
- When the screw plug is being loosened, do
- 1. Park the machine on a hard and flat ground and adjust position so that the draining closest in is closest to the ground. Stop the engine and place the lockout lever to the LOCKED position.
- 2. Use a proper screwdriver to remove the dirt in the hexagonal socket of screw plug.
- 3. Remove the screw plug (L) with a spanner. When oil level is 10 mm {0.4 in} lower than the bottom line of the port (L), the amount of oil added is just perfect.
 - 4. If the oil level is low, add specified gear oil through the fill port.
 - 5. Restore the screw plugs (F) and (L) after check. Tighten the screw plugs to specified torques.
- d.federico 2022-09-06 Ja. Jederico 2022-09 6. Check the other final drive using the same

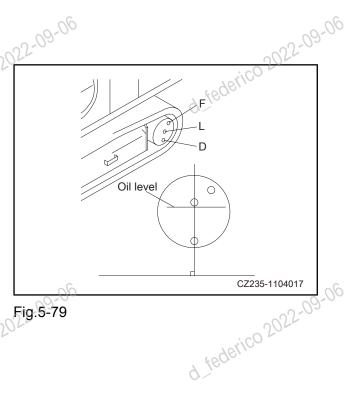


Fig.5-79

502022-09-06



5.8.9 Every 1000 service hours

5.8.9.1 General

d_federico 2022-09-06 The 100-, 250- and 500-hour services shall be carried out in the meantime.

5.8.9.2 Hydraulic oil suction filter element - replace

A CAUTION

d. federico 2022-09-06 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.

Note:

For machines equipped with a hydraulic breaker, the hydraulic oil deteriorates faster than that of machines operating with a bucket. For more information, see "Hydraulic oil and filter - change/replace" on page 8-15.

- 1. Park the 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.
- 2. Remove the butterfly nut (1) of the breather valve on top of the hydraulic tank. Press the vent valve to release internal pressure.

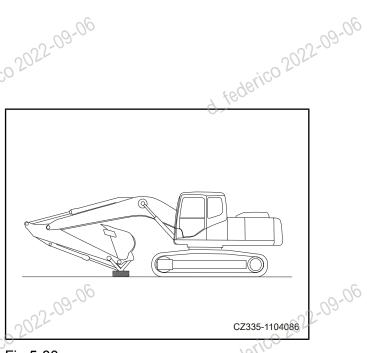


Fig.5-80

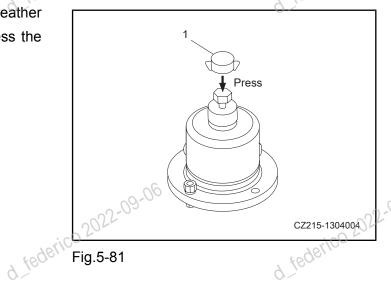


Fig.5-81

- 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 (2). 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 2022 5. Clean the disassembled parts with cleaning oil;;c^O
 - 6.Install a new filter element.
 - 7. Restore the valve (4), strainer (5) and spring (3).
 - 8. Install the cap (2) to its position. Hold down the cap and tighten the bolts.
 - 9. In order to bleed internal air, start and run the engine at low idle for 10 minutes. derico 2022-09-06
 - 10.Stop the engine.

5.8.9.3 Swing drive oil - change

CAUTION

 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.

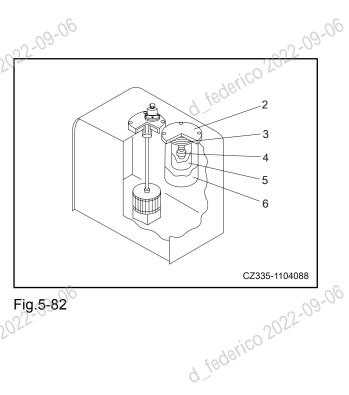


Fig.5-82





d. federico 2022-09-06

- Swing drive casing capacity: 4.0 L (1.06 US) gal):(\
- 1. Place a container under the drain valve (P) to collect the gear oil drained.
- 2. 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.
- 3. Remove the filler cap (F) and add oil as required through the filler opening.
- 4. Check the oil level. For more information, see "Swing drive oil level - check/fill" on page 5-65.
- 5. Apply sealant onto the thread of the filler opening and tighten the filler cap.

Tightening torque: 2.7N·m

d federico 2022-09-06

NOTE:

Improper tightening of the filler cap may cause the gear oil in the swing drive to leak.

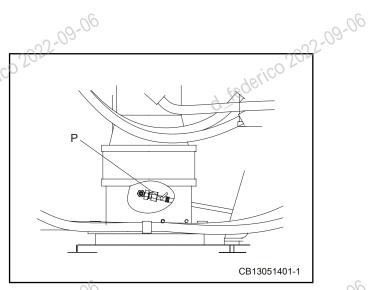


Fig.5-83

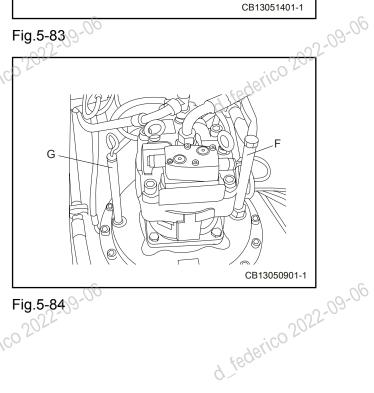


Fig.5-84



5.8.9.4 Cab door lock and front window lock catch - inspect/tighten 1. Check the body of the cab day.

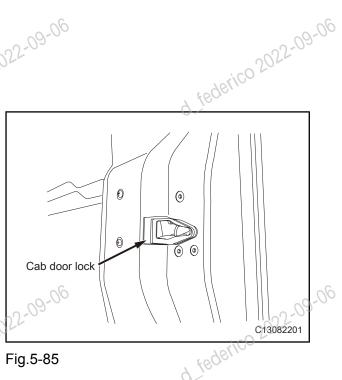


Fig.5-85

d. federico 2022-09-06 d federico 29 2. Check the lock catch of the cab door lock.

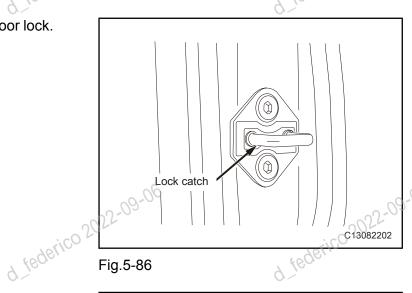


Fig.5-86

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

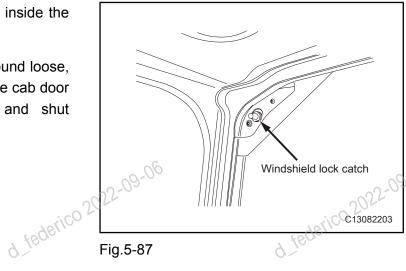


Fig.5-87



2-09-06 5.8.9.5 Cab door hinge and front window slide rail - inspect/add grease

Inject grease through the grease fi tting on top of the cab door hinge till grease is seen spilling out.

federico 2022-09-06 d federico 2022-09-06 Grease fitting C13082204

Fig.5-88

d_federico 2022-09-06

Apply grease onto the slide rails at both sides of the cab door ceiling.

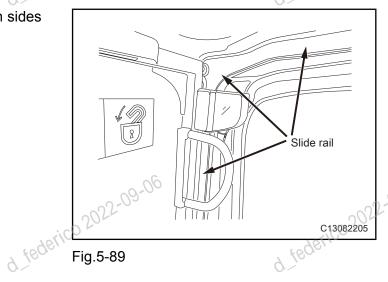


Fig.5-89

d federico 2022-09-06

d. federico 2022-09-06

d federico 2022-09-06

federico 2022-09-06 5.8.9.6 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.

- 1. Raise the nut cap at the end of the wiper arm and check if the nut comes loose.
- 2. Tighten it with a torque wrench or an ordinary wrench if the nut is loose.

Tightening torque: 35~45N·m d federico 2026

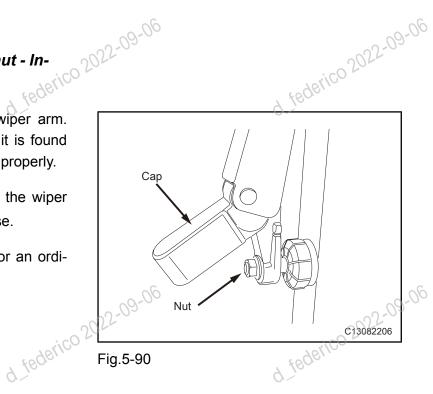


Fig.5-90

5.8.9.7 Engine exhaust pipe clamps check

Consult your Sany dealer to check the fastening conditions of the air cleaner - turbocharger - post cooler - engine clamps.

5.8.9.8 Fan belt tension - check/replace

belt in case of cracks or damage. Contact your Sany dealer if you have any troub! your Sany dealer if you have any troubles

5.8.9.9 Nitrogen pressure in accumulator (breaker) - check

(If equipped)

Special tools will be used in order to check the accumulator and inject nitrogen.

Please consult your Sany dealer, if possible, d.federico 2022-09-06 to conduct related inspection and infl ating operation ? d federico 20





5.8.9.10 Fan belt tension - check/ replace

federico 2022-09-06 Check the tension of fan belt. Replace the fan belt in case of cracks or damage. Contact your Sany dealer if you have any troubles.

5.8.9.11 Nitrogen pressure in accumulator (breaker) - check

(If equipped)

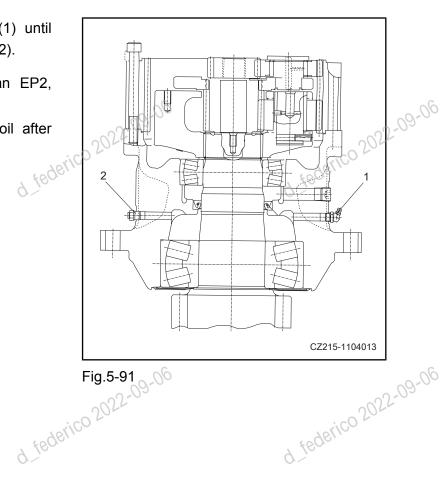
Special tools will be used in order to check the accumulator and inject nitrogen.

Please consult your Sany dealer, if possible, to conduct related inspection and infl ating operation.

5.8.9.12 Swing mechanism grease check and add

Add grease through injection port (1) until grease seeps out from overfl ow port (2).

- Use EP grease (SHELL: Albanian EP2, etc.)
- Lube oil: Change and add lube oil after 1,000 hours of motor running.



erico 2022-09-06

d federico 2022-09-06





federico 2022-09-06 5.8.9.13 Hydraulic tank breather valve filter element- replace

CAUTION

- Stop the engine before replacing the breather valve.
- 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. 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.

- 2. Remove the butterfly nut (1) on the breather valve and press the vent valve to release internal pressure.
- 3. Remove lock nut (2), cover (3) and take off the filter element (4).
- 4. Clean the cover (3) with a brush if excessive dirt is found inside. Replace a new filter element if it is broken.
- 5. Install the cover (3) and tighten lock nut (2).

NOTE:

 When assembling the lock nut (2), tighten it to the specific torque (10-14 N·m).

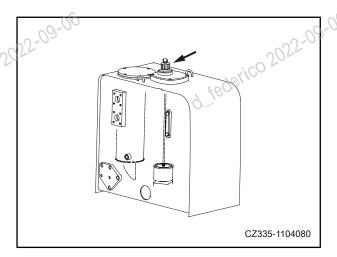


Fig.5-92

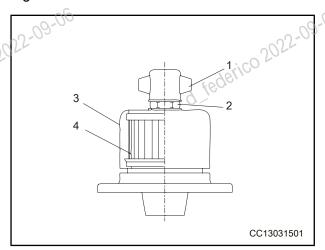


Fig.5-93 d federico 2022-09-06

5.8.10 Every 2000 service hours

5.8.10.1 General

The 100-, 250-, 500- and 1000-hour services will be carried out in the meantime.



5.8.10.2 Final drive oil - change

WARNING

- 16 Jerico 2022-09-06 When the engine is shut down, the oil is still hot. Wait until the oil is cool enough before operation.
- Residual pressure in the tank can cause oil to squirt out or the screw plug to fly out. Slowly loosen the screw plug in order to release the pressure.
- When the screw plug is being loosened, do
- Refilling capacity: Refer to "Table of capacities" on page 5-14. pacities" on page 5-14.
- 1. Park the machine on a hard and flat ground and adjust position so that the drain plug (D) is closest to the ground. Stop the engine and place the lockout lever to the LOCKED position.
- 2. Use a proper screwdriver to remove the dirt in the hexagonal socket of screw plug.
- 3. Place a container under the drain port (D) to collect the oil. Loosen the level port plug (L) and the drain port plug to discharge oil.
- 4. When the oil in the final drive is drained, clean the drain port plug with clear diesel fuel and install the plug.
- 5. Remove the fill port plug (F) and add speci-6. Clean the plug with clear diesel fuel and reinstall the plug. fied gear oil through the filler opening until oil

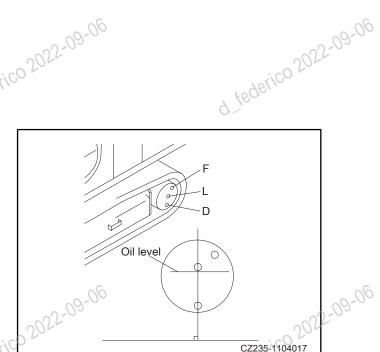


Fig.5-94



NOTE: 2022-09-06

ico 2022-09-06 Check the O-ring on screw plug and replace the O-ring if it is damaged.

5.8.10.3 Hydraulic oil suction filter element - clean/replace

CAUTION

- 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
- 1. Remove the butterfly nut (1) of the breather valve on the hydraulic tank and press the valve to relieve :- 1 valve on the hydraulic tank and press the vent

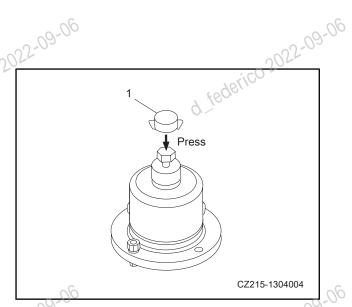
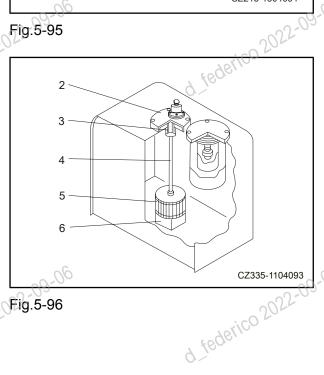


Fig.5-95

- ,2022-09-06 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 ele-
- 5 During installation, fix the suction filter element (5) to the projected part (2) before assembling.



the cap (2) to hold the spring (3) before tightening the bolts.

5.8.10.4 Nitrogen pressure in accumulator (control oil circuit) - check

WARNING

- The accumulator contains pressurized nitrogen, which may explode due to improper operation and result in machine damage Jerico 2022-09-06 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 your Sany dealer to do this job.

Note:

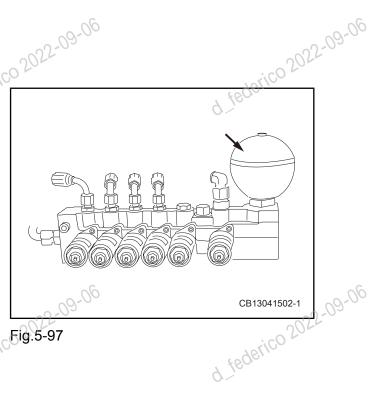
In continuous operation with low nitrogen pressure in the accumulator, the remaining pressure in hydraulic circuit will not be re-

The accumulator stores the pressure of the control circuit. Even if the engine is turned the control oil circuit allowed follows: 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.

d federic Fig. 5-97 The installation location of the accumulator is shown in the right illustration.





Checking the functions of accumulator

WARNING

· During inspection, make sure the surrounding area is clear of personnel or any 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 conducted 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 4. Turn the start switch to the ON position

 5. Place the hydraulic loc'
 FREE --

 - FREE position. Operate the joysticks and lower the work equipment. Check if the work equipment touches the ground.

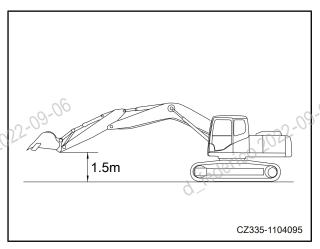
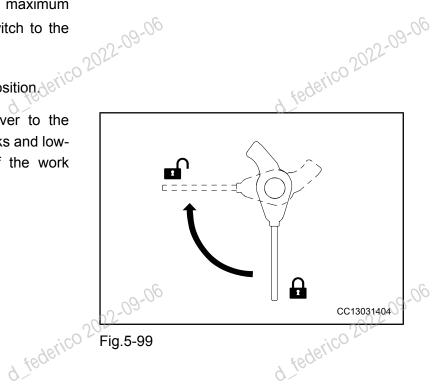


Fig.5-98

ico 2022-09-06





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 your Sany dealer for such an inspection.

7. Place the hydraulic lockout lever to the LOCKED position and turn the start switch to the OFF position.

How to release pressure in hydraulic circuit circuit

- 1. Low the work equipment to the ground.
- 2. Place the lockout lever to the LOCKED position.

The steps 4 through step 6 shall be carried out within 15 seconds.

Pressure of the accumulator will drop gradually after the engine is stopped. Therefore, the pressure can only be released when the engine has just be turned off. d federic

- 3. Turn off the engine.
- 4. Turn the start switch to the ON position.

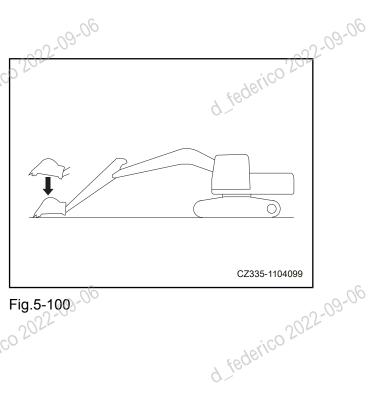


Fig.5-100

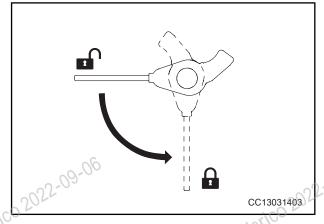
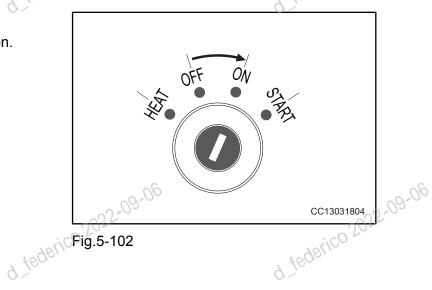


Fig.5-101





5.Place the lockout lever to the FREE position and then cycle the control levers in all all tions to the state. tions to release the pressure in control circuit.

6. Place the lockout lever to the LOCKED position and then turn the start switch to the OFF position.

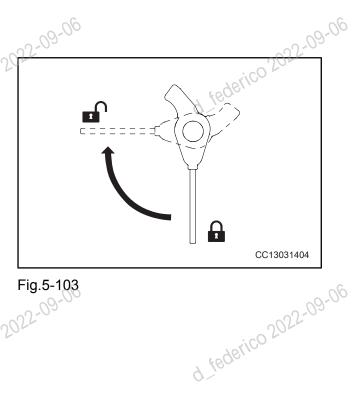


Fig.5-103

5.8.10.5 Cooling system interior - clean

WARNING

- Coolant in the radiator is still hot and under high pressure when the engine is shut down. Removing the radiator cap at this time may cause severs burns.
- Loosen the cover slowly when the coolant has cooled down to relieve internal pressure before removing it.
- prace the hydraulic lockout control in the LOCKED position to prevent unexpected machine movement When the engine is started for cleaning
- Antifreeze is flammable. Keep it 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.
- d.federico 2022-09-06 Never drain antifreeze directly into the sewer or onto the ground. d federico 2022

d_federico 2022-09-06

Clean the inside of radiator fins and replace coolant

- 1. Park the 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.
- 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. Continue to run the engine for about 10 minutes.
- 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 slowly into the radiator till it overflows from the filler opening.
- 7. Run the engine at low speed for about 5 minutes and then at high speed for another 3 minutes to bleed the air from the coolant. (The radiator cap (1) shall be left open at the moment.)

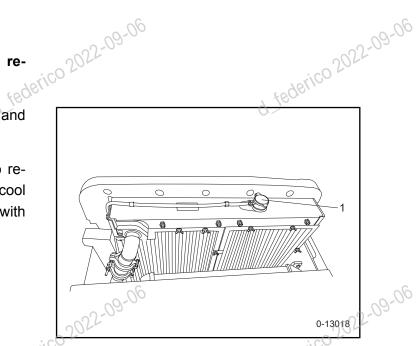


Fig.5-104

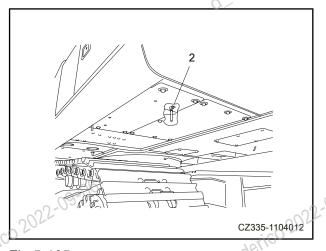


Fig.5-105



- 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.
- 10. Stop the engine. Wait about 3 minutes before adding water through the filler opening. Screw on the radiator cap tightly.

- Clean the inside of hydraulic oil cooler 1. Remove the hydraulic oil cooler before cleaning. Cleaning shall be performed on a clean washing table.
 - 2. Rinse the cooler with hydraulic oil of the same grade, plane kerosene, petrol or diesel fuel. Blow the inside of the cooler with an air pump.

cooler clean during the cleaning process. Do not wipe the cooler with cotton lines thetic fibers not wipe the cooler with cotton, linen or synthetic fibers.

Recommended cleaning agent: Hydraulic oil of the same grade, plane kerosene, petrol, diesel fuel.

5.8.10.6 Alternator - inspect

Contact your Sany dealer to inspect the alternator.

d.federico 2022-09-06 Check the engine every 1000 service hours if the engine is started frequently.

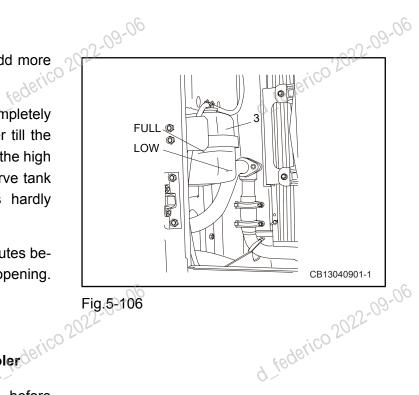


Fig.5-106



5.8.10.7 Engine valve clearance check/adjust

federico 2022-09-06 Special tools are necessary for inspection and maintenance. Consult your Sany dealer to do this job.

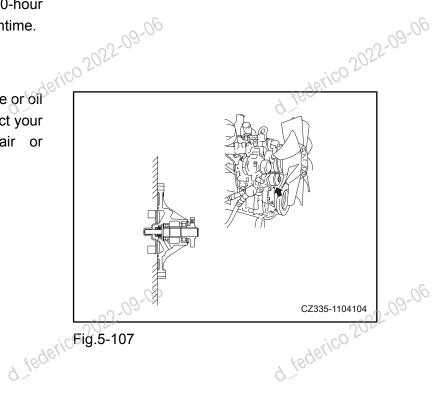
5.8.11 Every 4000 service hours

5.8.11.1 General

The 100-, 250-, 500-, 1000- and 2000-hour

Check the water pump for water leakage or oil leakage. In case of any problem, contact.

Sany dealer for discreplant replacement.



federico 2022-09-06 5.8.11.3 Start motor - check

Consult your Sany dealer to check the start motor. Check it every 1000 service hours if the engine is started frequently.

5.8.11.4 Accumulator - replace

d. federico 2022-09-06 Replace the accumulator every two years or 4000 service hours, whichever occurs fi rst. d federico 2022-1



WARNING

- 02022-09-06 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 accumulator. Consult your Sany dealer to do this job.

If the machine is kept operating when the performance of accumulator decreases, the pressure in the hydraulic system will not be released. Consult your Sany dealer to replace the accumulator.

The accumulator's installation location is shown in the right illustration.

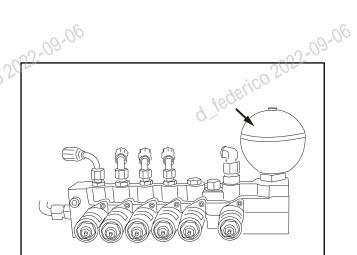


Fig.5-108 fig d federico 2022

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

CB13041502-1

d. federico 2022-09-06 d. federico 2022-09-06 federico 2022-09-06 CZ335-1104106

5.8.11.5 High-pressure tube clamps and rubber check

Fig.5-109

Check, through visual inspection and feel, for any loose bolts on the five mounting clamps of highpressure pipe between the supply pump and the spray nozzle. Contact your Sany dealer to replace the parts in trouble.

₃derico 2022-09-06 5.8.11.6 Compressor working condition

- inspect

The following two items are to be inspected:

- 1. Whether the compressor and the magnetic clutch are switched on/off when switching on/ off the air conditioner.
- 2. Whether the clutch or compressor produces abnormal noise.

In case of any problem, contact your Sany dealer for disassembly, repair or replacement d.federico 2022-09-06 d. federico 2022-09-06

d_federico 2022-09-06

5.8.11.7 Hydraulic tank oil - change

CAUTION

- 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 fi ller cap.

For machines equipped with a hydraulic breaker, the hydraulic oil deteriorate. than that of machines operating with a bucket. For more information, see "Hydraulic oil and filter - change/replace" on page 8-15.

- Refilling capacity: Refer to "Table of capacities" on page 5-14.
- 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 pod. federico 2022-09-06 d federico 2022-09 sition and turn off the engine.

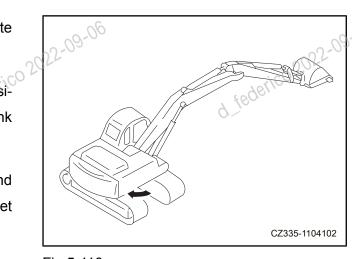


Fig.5-110

ico 2022-09-06



d_federico 2022-09-06



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 between the H and L marks of dipstick.

- For more information on applicable hydraulic 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.

5.8.12 Every 8000 service hours

5.8.12.1 Maintenance after every 8000 h

100-, 250-, 500-, 1000-, 2000- and 4000-hour services shall be carried out in the meantime.

5.8.12.2 High-per

replace

Contact your Sany dealer to replace the highpressure tube clamps of the engine.

5.8.12.3 Maintenance after every 10000 h

federico 2022-09-06 If the machine runs up to 10,000 hour cumulatively, please contact your Sany Heavy Machinery authorized dealer for maintaining the whole machine.

5.8.12.4 Maintenance during long-term storage

Some components of the excavator will deteriorate during long term storage, so in order to ensure the performance of the excavator, please perform regular maintenance according to table below:

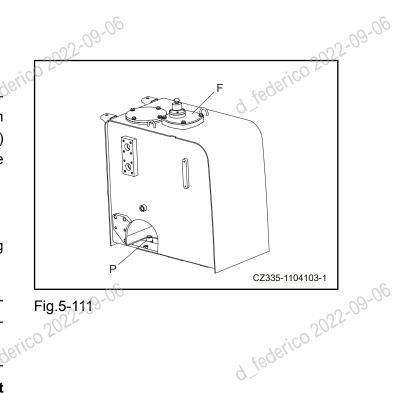


Fig.5-111



_	2022-09-06		2022-09-0	<i>S</i> 6	0022-09-06
d te	Larico L	6 months~1 year (excluding 1 year)	1~2 years (excluding 2 year)	Over 2 y	years Remark
	Apply grease to work equipment pins	0	0	0	Remove the excess grease
	Drain water from fuel tank	0	0	0	
=	Change engine oil		0	0	
-	Replace engine oil filter element		0	0	
	Replace fuel filter element		0	0	
_	Verify and fill A/C refrigerant		022-09-1	0	federico 2022-09-06
400	Replace hydraulic oil return filter	£2(Jerico 20	0	*ederico Lo
9-10	Change antifreeze	9.70		0	9.10

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d federico 2022 09-06	d federico 2022 09-06	9 tegarico 3022-09-06
3 tederico 2022-09-06	<u>d.ederico</u> 2022	<u>Jederico</u> 2022-09-06
0. jederic 2022 09-06	2022-09-06 J. 1800-100	1, federico 2022-09-06
d. federico 2022-09-06	d. federico 2022.09-06	9 tegsico 5025-08-06



Troubleshooting

09-00	09-00	09
6.1 Special Instructions		6-1
6.1 Special Instructions		6-3
6.2 Preparations before Troublesho	oting	6-4
6.2.1 Inspections before trouble	shooting	6-4
6.2.2 Precautions for troublesho	ooting	6-6
6.2.3 Precautions for circuit trou	bleshooting	6-7
6.2.4 Precautions for handling h	ydraulic components	6-7
6.2.5 Towing		
6.3 Engine Faults		6-11
6.3.1 Faults diagnosis table of e	ngine	6-11
6.3.2 High water temperature	,,	6-17
6.3.2 High water temperature6.3.3 Abnormal engine oil press	ure (low pressure)	6-18
6.3.4 Fuel run-out	0022-00-1	
6.3.5 Engine kick-back	10ic0 -	6-20
6.3.4 Fuel run-out	1800	6-21
6.4.1 Faults diagnosis table of e		
6.4.2 Display monitor		6-24
6.4.3 Battery		
6.4.3.1 General		6-27
6.4.3.2 Removal and refitting	of battery	6-27
6.4.3.3 Battery charging	-	
6.4.3.4 Start engine with auxil		
6.5 Hydraulic system fault		6-31
6.6 Other common faults	00-00	6-35
2022	2022-0	2022-0
derico -	derico	48KiCO F
6.5 Hydraulic system fault	teur	d_federico 2022

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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

d federico 2022-09

6.Troubleshooting

6.1 Special Instructions

d_federico 2022-09-06 Situations described below, if occurred during operation, are normal and in line with industry standard, and thus please feel relieved to use.

- 1. You misunderstand an unavailable function as a fault due to unfamiliarity with the features of the machine (For example, the product is not applicable to a altitude higher than 4km)
- gine is proved by the field test in the normal operating range, i.e. the FSNs of ous load and steady load are not greater than 4.5RP and 1.5RP respectively at an ambient temperature below 30°C.
- 3. Excessive consumption of engine oil and fuel occurs but turn out in the normal range specified by the manufacturer in the field test.
- travel and slow movement occurs due to your unskilled operation and unstable travels. unskilled operation and unfamiliarity with working condition, but all the parameters are proved by the field test in the normal range specified by the manufacturer. (e.g., the tail of the counterweight is tilted upward, and the gradeability is greater than 35°, etc.)
- 5. Unusual noise comes up in process of oil is checked that the hydraulic system is normal and the return oil filter is free of return of the hydraulic system (such as unusuand the return oil filter is free of without impurities as iron chips, cooper chips and aluminum

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

chips such that no affect will be exerted to the normal operation of the device.

6. Common phenomena in the industry, such as discoloration or blackening of piston rod, reverse or automatic movement of cylinder, and start difficulty of engine in chilly winter days

d_federico 2022-09-06 Jederico 2022-09-06

6.2 Preparations before Troubleshooting

6.2.1 Inspections before troubleshooting

spections before troubleshooting	22-09-06	2022-09-06
	1.6	22-0
Inspection Item	Judgment Standard	Measures
Confirm fuel level and type		
2. Check the fuel for foreign matters		
3. Check the hydraulic oil level	_	Refuel
4. Check the hydraulic oil filter screen	<u> </u>	Clean and drain Refuel
5. Check oil level of upper structure	_	Clean and drain
6. Check the engine oil level (oil pan oil level)7. Check the coolant level8. Check blockage of air cleaner9. Check the hydraulic oil filter element	- - - - - - - - - - -	Refuel Refuel Add coolant Clean or replace Replacement Refuel
10.Check oil level of the final drive case		
 Check the looseness and corrosion of battery terminals and wires Check the looseness and corrosion of alternator terminals and wires Check the looseness and corrosion of 	⁵⁵⁻⁰⁹⁻⁰⁶ —	Tighten or replace Tighten or replace Tighten or replace
	1. Confirm fuel level and type 2. Check the fuel for foreign matters 3. Check the hydraulic oil level 4. Check the hydraulic oil filter screen 5. Check oil level of upper structure 6. Check the engine oil level (oil pan oil level) 7. Check the coolant level 8. Check blockage of air cleaner 9. Check the hydraulic oil filter element 10. Check oil level of the final drive case 1. Check the looseness and corrosion of battery terminals and wires	1. Confirm fuel level and type 2. Check the fuel for foreign matters 3. Check the hydraulic oil level 4. Check the hydraulic oil filter screen 5. Check oil level of upper structure 6. Check the engine oil level (oil pan oil level) 7. Check the coolant level 8. Check blockage of air cleaner 9. Check the hydraulic oil filter element 10. Check oil level of the final drive case 1. Check the looseness and corrosion of battery terminals and wires

		20-00	0.00	20-00	
	relico S	Inspection Item	Judgment Standard	Measures	
d tel	Hy draul ic	Check for abnormal noises and odors Check for oil leakage	- 1	Repair it Repair it	
	devi ces	3. Bleed the air		Exhaust	
		Check the battery voltage (with engine shut down)			
		Check the battery electrolyte level Check for discolored, burnt or peeled wires	20-30V	Replacement 22-09-06	
d fe	Elec tricity	wires 4. Check for falling clamps or hanging wires	— — —	Refill or replace it Replacement Repair it	
	and elec tric equip ment	5. Check whether the wire is wet (check connectors or terminals carefully)	_ _ _	Remove the connector and	
		6. Check whether the fuse is fused or corroded	After running for a few minutes: 27.5~ 29.5V	blow it dry Replacement Replacement	
		7. Check the alternator voltage (with the en-	_	Replacement	
		gine running under the condition over half throttle)	9.06	22-09-06	
, fe	Jerico 20	8. Check the working noise of battery relay (turn the switch between ON/OFF)		d federico 2022-09-06	



rico 2022-09-06

6.2.2 Precautions for troubleshooting

CAUTION

- Park the machine on the horizontal ground, and confirm the function of safety pin, cushion block and parking brake.
- During the collaborative operation, the signal shall be strictly unified and no irrelevant personnel can be allowed to be close to it.
- If the radiator cap is removed when the engine is hot, hot water will be sprayed and cause burning, so maintenance shall be carried out after the engine is cooled down.
- Do not touch any hot parts or hold any rotary parts
- Always dismantle the negative terminal [-]] first.
- When removing the internal oil pressure, water pressure or air pressure plug or cap, release
 the internal pressure first. the internal pressure first.
- When installing the measuring equipment, ensure that the connection is correct.
- The purpose of fault diagnosis is to accurately determine the root cause of the faults and expeditiously fix them and prevent their recurrence.
- During the fault diagnosis, to know the structure and function is of great importance.
- In order to conduct effective fault diagnosis, turning to operators to get a general knowledge of the possible fault causes is also one of the shortcut for fault diagnosis.
- 1. Do not disassemble parts immediately before troubleshooting. If parts are disassembled immediately, it may cause:
- The parts that are disassembled are irrelevant to the fault, or the parts have been disassembled unnecessarily.
- The fault cause cannot be found out. This will waste labor, parts, or oil and grease, while losing the user or operator's trust in the product. Therefore, during fault diagnosis, it is necessary to check in advance and make fault diagnosis according to the specified procedures.
- 2. Issues to be asked from users or operators:
- Are there any other unreported problems?
- Was there any abnormality before the fault appeared?
- Did the fault come up suddenly or following some signs?
- Under which circumstance the fault occurs?
- Was the machine repaired before the fault occurred?
- When was the machine repaired?
- Did this fault once appear?
- 3. Check other inspection items.
- Check the engine oil level.
- federico 2022-09-06 Check whether the oil leaks from the pipes or the hydraulic devices.
- Check the lever travel.



- Check the spool travel of the control valve.
- Other daily maintenance items can be inspected from the appearance, so only those deemed necessary can be checked.
 - 4. Confirm the fault
 - Confirm the fault, and determine whether it is a true fault, whether there are problems in use and operation, etc.
 - When the machine is operated and the fault phenomenon reoccurs, no inspection or measurement which will make the problem more serious shall be carried out.
 - 5. Troubleshooting
 - Conduct the inspections and tests according to item 2~4 to narrow the scope of fault causes, d_federico 2022-09-06 then identify the faulty point according to the fault diagnosis flow chart.
 - The basic process of fault diagnosis is as follows: d federico
 - 1)Start with the easy problem
 - 2) Start with the possible problem
 - 3) Check other relevant content.
 - 6. Method of eliminating root cause of fault
 - Even if the troubleshooting is done but the root cause is not eliminated, the same fault will occur again. Therefore, it is necessary to find out the cause of the fault and eliminate the root cause.

6.2.3 Precautions for circuit troubleshooting

- Disconnect or connect the related connectors for several times for checking.
- 2. Check if all related connectors are correctly inserted plugged before fault diagnosis.

 Disconnect or connect the related connectors for several times for observed. 3. Always connect all the disconnected connectors before transferring to next step of operation.
 - When the power is turned on with connectors disconnected, undesired abnormal indication will occur.
 - 4. When circuit fault diagnosis (measurement of voltage, resistance, connectivity or current) is undergoing, related wires and connectors should be moved for several times and the meters readings checked to be unchanged. d federico 2022-09-06
 - If the readings change, contact failure may exist in the circuit.

6.2.4 Precautions for handling hydraulic components

Due to increasing pressure and improved accuracy of hydraulic components, the most common fault cause is the oil sludge (foreign



object) in hydraulic lines. Special care must be taken when adding hydraulic fluid, disassembling or reassembling hydraulic components.

1. Working environment

Avoid adding hydraulic oil, replacing the filter or repairing the machine in the rain or strong wind or a dusty place.

2. On-site disassembling and maintenance operations

On-site disassembly and maintenance of hydraulic components may cause ingress of dust. It is also difficult to check the performance after repair, so you'd better replace with an assembly unit. Disassembly and maintenance of hydraulic components shall be carried out in a specially prepared dust-proof workshop, and the performance shall be checked by special test equipment.

3. Adding hydraulic oil

When filing the hydraulic oil, do not let oil sludge or dust mix in. Always keep the filter elements and their surrounding areas clean with the use of sanitary pumps and oil containers. The use of oil cleaning device is a more effective way to filter the oil sludge accumulated during storage.

4. Change of hydraulic oil under high temperature

Hydraulic oil or other oil is easy to move when kept warm. Besides, sediments may be easily expelled from the oil circuit together with oil.

Therefore, it is best to replace the oil while hot. When changing oil, drain the used hydraulic oil as much as possible. (Drain from hydraulic oil tank; and drain from the filter and the drain plug in the oil circuit.) The impurities and sediments in the used oil, if any, will be

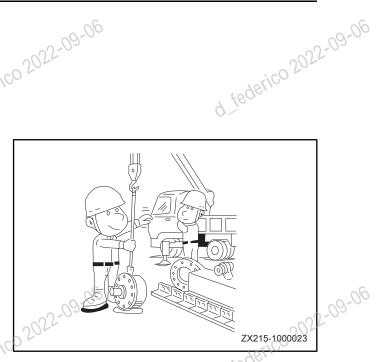


Fig.6-1

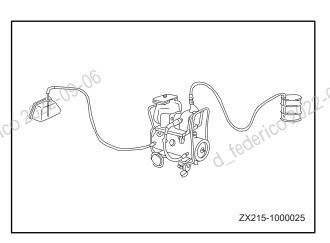


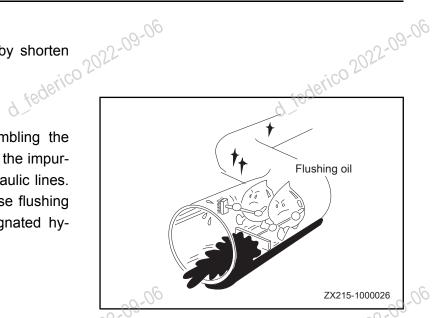
Fig.6-2



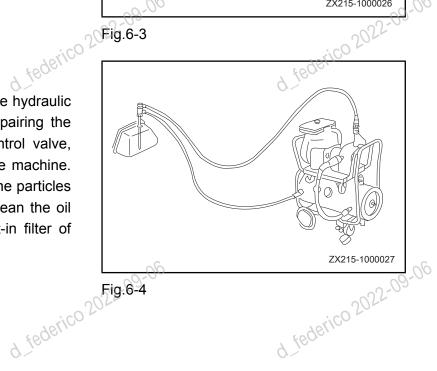
mixed with the new oil and thereby shorten the service life of hydraulic oil.

5. Flushing

When disassembling and reassembling the device or changing the oil, remove the impurities, sediments and old oil in hydraulic lines. Normally, twice flush is needed: use flushing oil for primary flushing, and designated hydraulic oil for secondary flushing.



Cleaning
The The sediments and impurities in the hydraulic lines need to be cleaned after repairing the hydraulic components (pump, control valve, etc.) or during the operation of the machine. Oil cleaning device can clear up fine particles (about 3 µ), and can effectively clean the oil lines without dismantling the built-in filter of the hydraulic components. d federico 2022-09-06



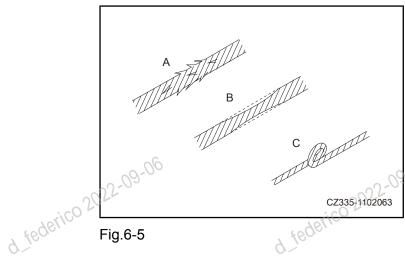


Fig.6-5

- Always check whether the rope for traction have enough strength to tow the most otherwise accident. have enough strength to tow the machine
- In the process of towing, do not use rope with breakage [A], decreased diameter [B] or twist [C], in case the rope would be broken.
- Always wear protective gloves to handle the rope.
- Don't tow the machine on a slope.
- derico 2022-09-06 • In the process of towing, do not stand between the towing machine and the towed machine.
- Operate the machine slowly, and do not apply load suddenly to the rope.

d_federico 2022-09-06

NOTE:

Allowable traction force:

215C-9: 146,000 N (14,900 kgf)

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

Make sure to tow the machine under the maximum capacity.

- If the excavator is trapped in the mud and cannot be driven out by it own power, or the if excavator is used for towing other heavy object, it is allowed to use the rope as the right picture shows.
 - Put wooden blocks or other protective materials under the contact site of the rope and the machine to prevent abrasion for both.
 - Keep the rope horizontal and in the same direction with the track frame.
 - Tow machine be to the desired repairing place with a speed less than 1 km/h. Prevent long-distance towing.
 - Never tow the machine except in emergency.

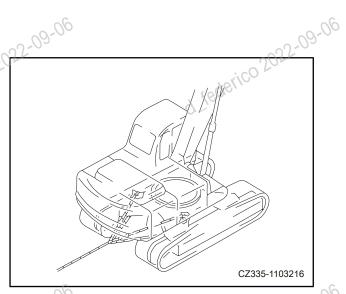
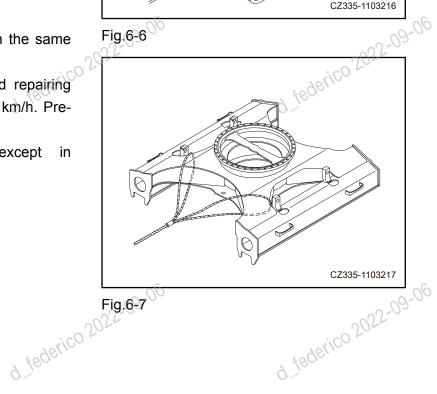


Fig.6-6



derico 3055-09-06 6.3 Engine Faults

6.3.1 Faults diagnosis table of engine

When a fault occurs, please conduct inspections according to the table below, and contact Sany authorized dealer to carry out repairs.





0.06			Measures Measures	
Fault content		Fault Analysis	Measures	
diffic rotal start	ire or cult tion of ter	 Power run-out of battery Disconnection , looseness and corrosion of battery cables Fuse short-circuit Failure of the ignition switch or start relay Failure of the starter motor High viscosity of engine oil 	 Please charge or replace the battery Please clean the corroded place Please replace the fuse Please replace the ignition switch or start relay Please repair or replace the starter motor Please change the engine oil with proper viscosity 	
start	starter	 Fuel run-out Low starting pressure of fuel injector Failure of the outlet valve of fuel injection pump Rod abrasion or adhesion of fuel injection pump Wrong starting operation Air in the fuel system Fuel filter occlusion Clogging of air filter Clutch slip Looseness of clamps for fixing air suction rubber hose to the turbocharger Cracking of air suction rubber hose of the turbocharger Blockage or failure of fuel injection pump flowmeter (MPROP) 	 Please add fuel and bleed air Please adjust or replace the fuel injector Please replace the outlet valve Please replace the rod assembly Please operate following the correct starting steps Please bleed the air in the fuel system Please replace the element or cartridge of the fuel filter Please clean or replace the element of the air cleaner Please repair or replace the clutch Please fasten the clamp Please replace the air suction rubber hose Please check and replace the flowmeter (MPROP) 	
Engine stop after starting	er _09-06	Low idle speedFuel filter occlusionClogging of air filter	 Power run-out of battery Please replace the element or cartridge of the fuel filter Please clean or replace the element of the air cleaner 	
Unstable low id		Failure of low idle speed control system	 Please repair or replace the low idle speed control system Please overhaul the fuel system 	

9

9

9

9

00-00	20-00	20-5		
Fault content	Fault Analysis	Measures		
federico 2022-09-06	 Leakage or clogging of fuel system Air in fuel system Water in fuel system Blocking of fuel filter element Fuel injection pump fault Improper adjustment of valve clearance Leakage at cylinder gasket, wear of cylinder liner, piston ring sticking or cracking, improper alignment of valve and valve seat 	 Please bleed the air in the fuel system Please change the fuel Please replace the element or cartridge of the fuel filter Please repair or replace the related parts of the fuel injection pump Please adjust the valve clearance Please replace the related parts 		
tederico 2022-09-06 Underpower	 Fuel filter occlusion Water in the fuel Clogging of air filter Fuel delivery pump fault Low starting pressure and poor injection effect of the fuel injector Fuel injection pump fault Exhaust gas leaking from the exhaust system Air leaking from the intake system Damage of turbocharger assembly Clogging of exhaust pipe Improper adjustment of valve clearance Weakening or breakage of valve spring Leakage at cylinder gasket, wear of cylinder liner, piston ring sticking or cracking, improper alignment of valve and valve seat 	 Please replace the element or cartridge of the fuel filter Please change the fuel Please clean or replace the element of the air cleaner Please repair or replace the fuel delivery pump Please adjust or replace the fuel injector Please repair or replace the related parts of the fuel injection pump Please repair or replace the related parts Please replace the turbocharger assembly Please clean the exhaust pipe Please adjust the valve clearance Please replace the valve spring Please replace the related parts 		
Engine overheating	Insufficient coolant	Please add coolant		
	•			

30-06	-0	.06	06-00
Fault content	Fault Analysis	Measures	-09
d federico 2022-09-06	 Slippage of fan belt due to looseness or cracking Damage of radiator cap or clogging of radiator core Water pump damaged Coolant leakage due to damage of cylinder head or/and cylinder block seal cover Damage of thermostat Cooling system blocked by foreign matters Improper adjustment of fuel injection timing 	 Please replace the fan belt Please replace the radiator cap or clean the radiator core Please repair or replace the water pump Please repair or replace the seal cover Please replace the thermostat Please remove the foreign matters in the cooling system Please contact SANY service personnel to adjust the fuel injection timing 	2-09-06
White smoke	 Water in the fuel Poor fuel injection timing Leakage at cylinder gasket, wear of cylinder liner, piston ring sticking or cracking, improper alignment of valve and valve seat Turbocharger fault Failure of oil seal, and wear of valve stem and valve guide Wear, breakage or improper setting of piston ring Scratching or wear of cylinder liner 	 Please change the fuel Please contact SANY service personnel to adjust the fuel injection timing Please replace the related parts Please repair or replace Please replace the valve oil seal, valve and valve guide Please replace the piston or reposition it properly Please replace the cylinder liner 	2-09-06
Black smoke	 Clogging of air filter Low starting pressure and poor injection effect of the fuel injector Improper adjustment of fuel injection timing Fuel dripping due to damaged outlet valve of fuel injection pump Excessive injection of the fuel injection pump 	 Please clean or replace the element of the air cleaner Please adjust or replace the fuel injector Please contact SANY service personnel to adjust the fuel injection timing Please replace the outlet valve Adjust the amount of fuel injection 	_09_06

00-00	201-010	~0-	
Fault content	Fault Analysis	Measures	
d federico 200	 Fuel leakage Clogging of air filter Improper adjustment of low idle speed Low starting pressure and 	Please repair or replace the related parts of the fuel system	
High fuel consumption	poor injection effect of the fuel injector Improper adjustment of fuel injection timing Fuel dripping due to damaged outlet valve of fuel injection Air leaking from the intakeside of the turbocharger Damage of turbocharger assembly Improper adjustment of valve clearance Weakening or breakage of valve spring	 Please clean or replace the element of the air cleaner Please adjust the low idle speed Please adjust or replace the fuel injector Please adjust the fuel injection timing Please replace the outlet valve Please repair the intake-side of the turbocharger Please replace the turbocharger assembly Please adjust the valve clearance 	
4 federico 2022-09-06	 Leakage at cylinder gasket, wear of cylinder liner, piston ring sticking or cracking, im- proper alignment of valve and valve seat 	 Please replace the valve spring Please replace the related parts Please change with suitable en- 	
High oil consumption	 Unsuitable engine oil Engine oil excess Engine oil leaking from oil seal and/or gasket No preheating operation Failure of oil seal, and wear of valve stem and valve guide Wear, breakage or improper setting of piston ring Scratching or wear of cylinder liner 	gine oil Please adjust the amount of engine oil Please replace the oil seal and/ or gasket Please follow the correct steps in operation Please replace the related parts Please replace the piston or reposition it properly Please replace the cylinder liner	
Low engine oil pressure	Low engine oil level	Please refill engine oil	

	06	00	Measures	06
Fault	t content	Fault Analysis	Measures	72
Unusual noise of	Noise of air leakage	 Improper viscosity of engine oil Engine oil leaking from oil seal and/or gasket Clogging of oil filter element Sticking of relief valve and/or weakening of by-pass valve spring Clogging of oil pump strainer Wear of relevant parts of oil pump Fitting looseness or damage of the exhaust pipe Looseness of fuel injector Looseness of exhaust manifold fitting Damage of cylinder gasket 	 Please use lubricant of proper viscosity Please replace the oil seal and/ or gasket Please replace the element or cartridge of the oil filter Please replace the relief valve and/or by-pass valve spring Please clean the oil pump strainer Please replace the related parts of the oil pump Please screw down exhaust pipe fittings or replace the exhaust pipe Please tighten up the fuel injector and replace the gasket Please tighten up the exhaust manifold fitting Please replace the cylinder gasket 	9-06
engine	Continuous	 Looseness of fan belt Looseness of cooling fan Wear or damage of water pump bearing Improper adjustment of valve clearance 	 Please adjust the tension of the belt Please tighten the cooling fan Please replace the water pump bearing Please adjust the valve clearance 	79-00



6.3.2 High water temperature

WARNING

• Do not open the cover of the cooler when the water temperature is excessively high, and if you do so, the boiling water or steam may splash and cause scald. When the temperature of the coolant goes down, please pad a thick cloth on the cover and open it slowly.

- Do not stop the engine immediately. Otherwise the rising temperature will be engine part engine parts
- Please add water slowly in multiple times in case the sudden injection of cool water cracks the engine.

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

vico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

When the reading of the water thermometer exceeds 100°C and the indication light is on, it means the water temperature of the cooler exceeds the limit. Please stop the device, and keep the engine running at a speed a little higher than idle speed to cool down. When the pointer of the water thermometer goes to the center and the High Temperature Light is off, stop the engine, then do as follows.

- 1. Check whether there is coolant leakage of the cooler rubber hose.
- 2. Check whether the V-belt is broken and the tension of the belt normal.
- 3. Check the amount of coolant. Please refill coolant when it is insufficient.
- Screw up the cover of the cooler [1], and refill the coolant to the cover mouth. After refilling, tighten up the cooler cover.
- Open the cover of the coolant reservoir [2], refill the coolant to the place where marks "FULL". After refilling, tighten up the cover of the coolant reservoir.
- 4. Check whether there is object in front of the cooler. cooler.
- 5. Coolant leakage or constant water temperature out-of-gauge indicates cooling system failure.

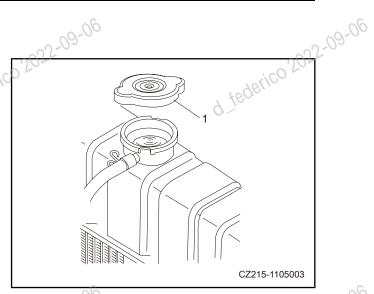


Fig.6-8

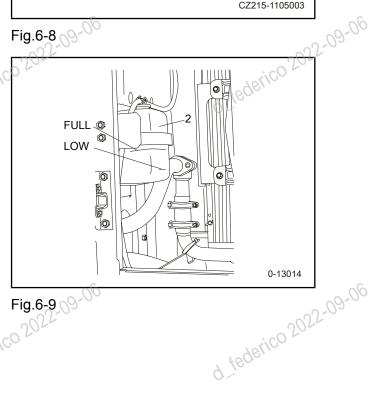


Fig.6-9

6.3.3 Abnormal engine oil pressure (low pressure)

etederico 2022-09-06 When the engine is just started, oil pressure gauge indicates high pressure. After adequate preheating operation, please check the oil pressure once more.

When the indicator warns abnormal oil pressure. Please stop the machine, and shut down the engine immediately and do as follows.



CAUTION

- ,02022-09-06 Please shut down the engine immediately for continuing operation may bring damage to the engine.
- 1. Check whether the engine oil leaks.
- 2. Check the amount of the engine oil, and refill if insufficient.
- Take out the engine oil dipstick [1], and clean the engine oil with cloth.
- Dip the dipstick completely into the engine oil, then take out slowly.
- If the engine oil trace on the dipstick is between H and L, the oil amount is normal.
 - Refill the engine with oil timely if it is insufficient. Replace the engine oil if it is obviously unclean.
 - Put the dipstick back to the slot after examination.
- 3. When the engine oil is of normal amount but the warning light still indicates abnormal pressure, please contact Sany authorized d federico 2021 dealer to repair

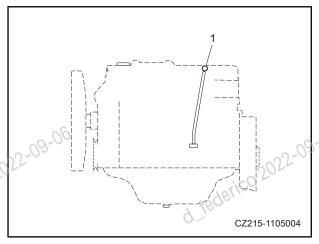


Fig.6-10

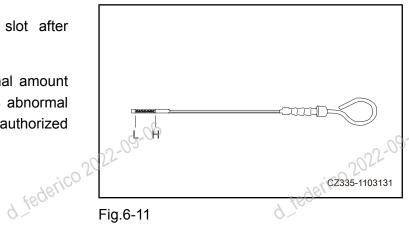


Fig.6-11

6.3.4 Fuel run-out

When fuel runs out, remember to add fuel before starting the engine, and discharge air from fuel system.







- Neither use lighter nor smoke during bleeding. Otherwise it may lead to find cause serious and
- Splashed engine oil or fuel may catch fire in case of heat source or cause slipping accident, so please clean up the splashed engine oil and fuel at the exhaust pipe or other places.
- Since the operation area is cramped, be careful not to get hurt by the surrounding parts.
- 1. Loosen the bleed screw of the fuel filter seat for about 1.5 turns.
- 2. Bleed the air by the diaphragm type priming pump on the filter.
- 3. When there is no air bubble in the fuel discharged from the bleed screw, tighten the bleed screw to the specified torque (8.8 Nm).

WARNING

 Please confirm if there is fuel leakage around the filter, since the fuel leakage can cause a fire.

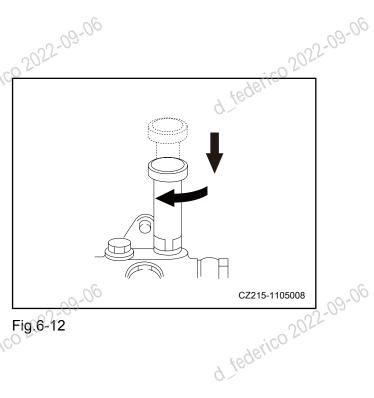


Fig.6-12

6.3.5 Engine kick-back

WARNING

 When the engine kicks back, please shut down the engine immediately, otherwise the engine will burn in a few minutes or serious accident may occur, and the exhaust gas from the air cleaner may also cause a fire.

When the engine kicks back, following situation will come up.

- Harsh impacting noise at the beginning of running.
- Black smoke from the air cleaner.
- ,2022-09-06 Low engine oil pressure warning on the display Please check and clean the air cleaner and rubber hose after stop, and if any abnormality is found, replace the affected part with a new one.

d. federico 2022-09-06 6.4.1 Faults diagnosis table of electrical system

When a fault occurs, please conduct in authorized dealers. When a fault occurs, please conduct inspections according to the table below, and contact Sany

Fault content	Fault Analysis	Measures
The engine cannot be started	 Low battery Internal fault of ignition switch Pilot switch fault Wire harness open circuit Fuse F1 fault Short circuit of wire (grounding fault) Internal fault of alternator Starter relay fault Failure of shutdown device 	 Charge or replace the battery Replacement Repair or replace the part Repair or replace the part Inspect and repair Replacement Inspect and repair Repair or replace the part Repair or replace the part Replacement Replacement Replacement Repair or replace the part
Irregular fluctuation of engine speed	 Open circuit of wire harness Internal fault of sensor Short circuit of wire (grounding fault) Internal fault of controller 	Inspect and repairReplacementInspect and repairReplacement
The complete vehicle can't be powered off	Battery relay fault Surge diode breakdown	Replacement Replacement
It runs idly automatically and doesn't work	 Boom lifting signal fault Boom lowering signal fault Arm digging signal fault Arm unloading signal fault Bucket digging signal fault Bucket dumping signal fault Swing signal fault Traveling signal fault Accessory signal fault Controller fault 	 Inspect and repair Replacement

19-00			
Fault content	Fault Analysis	Measures	
The preheating function is disabled	 Failure of glow plug fuse Failure of glow plug relay Short circuit of wire (grounding fault) Failure of glow plug controller 	ReplacementReplacementInspect and repairReplacement	
No equipment works	 Safety lock switch fault Short circuit of wire (grounding fault) Internal coil failure of pilot lockout solenoid valve 	 Repair or replace the part Inspect and repair Replacement 	
Slow and powerless rising movement of the boom	 Sensor fault Short circuit of wire harness (grounding fault) Harness open circuit Controller fault 	 Replacement Inspect and repair Inspect and repair Replacement 	
Slow and powerless movement of the arm	 Sensor fault Short circuit of wire harness (grounding fault) Harness open circuit Controller fault 	ReplacementInspect and repairInspect and repairReplacement	
Slow and powerless movement of the bucket	 Sensor fault Short circuit of wire harness (grounding fault) Harness open circuit Bucket converging solenoid valve fault Controller fault 	 Replacement Inspect and repair Inspect and repair Inspect and repair Replacement 	
Slow and powerless traveling movement	 Sensor fault Short circuit of wire harness (grounding fault) Harness open circuit Controller fault 	ReplacementInspect and repairInspect and repairReplacement	
The display is blank	 Fuse fault Wire disconnection fault Short circuit of wire (grounding fault) Display screen fault 	 Replacement Inspect and repair Inspect and repair Replacement 	

	20-00	20-00	20-
	Fault content	Fault Analysis	Measures
die	The display has no display	 Resistance fault Wire disconnection fault Short circuit of wire (grounding fault) Fault of display or controller 	 Replacement Inspect and repair Inspect and repair Replacement
	The high/low traveling speed function is disabled	 Fault of high/low speed traveling solenoid valve Wire disconnection fault Short circuit of wire (grounding fault) 	Replacement Inspect and repair Inspect and repair
die	Incorrect temperature display of engine coolant	 Coolant temperature sensor fault Wire disconnection fault Short circuit of wire (grounding fault) Short circuit of wire and 24 V 	 Replacement Inspect and repair Inspect and repair Inspect and repair
	The display of fuel level is inaccurate	 Oil level sensor fault Wire disconnection fault Short circuit of wire (grounding fault) Short circuit of wire and 24 V 	 Replacement Inspect and repair Inspect and repair Inspect and repair
9.16	The wiper doesn't work	 Internal fault of wiper motor Wire disconnection fault Short circuit of wire (grounding fault) 	 Repair or replace the part Inspect and repair Inspect and repair
	The display of arm digging pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement
9.46	The display of arm unloading pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement



29,06	29,06		-09-06
Fault content	Fault Analysis	Measures	
The display of boom lifting pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement 	
The display of boom drop pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement 	09,06
The display of bucket digging pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement 	
The display of bucket unloading pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement 	
The display of swing pilot pressure is inaccurate	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement 	09-00
Incorrect display of travel pilot pressure	 5 V power supply fault Signal wire open circuit Signal wire short circuit Sensor fault 	 Repair or replace the part Inspect and repair Inspect and repair Replacement 	

Conduct fault diagnosis & analysis according to the DTC on the display. As for the description to DTC, please refer to relay-related description in the "Operation" section. 2022-09-06

20.06		00.06	
DTC	Fault content	Activating conditions	
tederico 20	CPU fault	Ambient temperature and external noise above the specified values.	
On	Memory fault (RAM)	In the case of power on, abnormality is detected by	
11	Memory fault (FROM)	FROM sum check and RAM verify	
	Abnormal motor current (Above 1.8A)	Abnormal load circuit of the motor is detected. The current maintains below 0.1A or above 1.8A for 2 s during the power-on. The current output is stopped	
12	Abnormal motor current (Below 0.1A)	by the drive protection circuit. Disconnection and short circuitto ground. The rotation of the motor is limited.	
12 federico 2022-09-06	Abnormal motor connection (Disconnection and short circuit)	Abnormal motor connection is detected Disconnection and short circuit to ground.	
13	Motor action pause	A pause in the motor is detected. The position deviation is more than 5% within 30 s after the power-on. The motor is hung or hooked.	
14	Defective motor in the action range	Below the minimum stroke limit position voltage (0.8V) or above the maximum stroke limit position voltage (4.2V) for 100 ms	
15	Power voltage abnormality	Above 36V power supply	
tederico 2022	Controller internal temperature abnormality	The controller internal temperature is higher than 80°C or keeps at -30°C for 10 s.	
17	Sensor power abnormality	Sensor power output abnormality is detected. Short circuit or overcurrent.	
18	Control panel controller communication abnormality	The response communication (RS-422) from the control panel controller stops for 5 consecutive times.	
19	Backup battery voltage too low	Abnormal backup battery voltage is detected.	
202-09-09	Front pump output pressure	4co 2022-09-06	
jederico 21	Rear pump output pressure	The voltage beyond the 0.25~4.75V lasts over 200 ms.	
22	Arm retracting pressure		

0	006	20,06
DTC	Fault content	Activating conditions
d federico	Arm extending pressure pilot valve	Activating conditions Lederico
24	Boom lifting pilot valve pressure	
25	Boom lowering pressure	
26	Bucket digging pressure pilot valve	
27	Bucket unloading pressure pilot valve	00
28 2022-0	Swing pilot valve pressure	federico 2022-09-06 d_federico 2022-09-06
d 18de/18	Left traveling pressure pilot valve	tegeno d'tegeno
30	Righttraveling pressure pilot valve	
31	Motor setting potentiometer	
32	Motor built-in potentiometer	The voltage beyond the 0.25~4.75V lasts over 50 ms.
33	Spare pilot valve pressure	The voltage beyond the 0.25~4.75V lasts over 200 ms.
37 2022	Oil temperature sensor	ms. The voltage beyond the 0.25~4.75V lasts over 200 ms. The CPU detects that the engine speed is too low.
41	Engine speed	The CPU detects that the engine speed is too low. The speed is below 100 RPM. The speed sensor is disconnected and short-circuited.
50	Front pump	Abnormal load circuit of the proportional solenoid coil
51	Back pump	(overcurrent). The current above 1.8 A lasts for 1 s. The deviation current occurs on the drive protection
52	Swing priority	circuit. Disconnection and short circuit.
53	Bucket converging	Abnormal load circuit of the proportional solenoid coil
54	Boom priority (1)	(undercurrent). The deviation current above 0.1 A lasts for 1 s. The deviation current occurs on the
55 222-0	Boom priority (2)	drive protection circuit. Disconnection and short circuit.
d federico	Traveling speed switching	Abnormal ON/OFF solenoid coil connection is detected. Disconnection and short circuit.

6.4.3 Battery

6.4.3.1 General

WARNING

- It is dangerous to charge the battery when the battery is mounted in the machine. Always disassemble the battery from the machine before charging.
- When checking or handling the battery, always turn the ignition key to OFF to shut down the engine.
- When handling the battery, always wear goggles and rubber gloves.
- When disassembling the battery, disconnect earthing cable (negative terminal [-]) first. During installation, first install the positive terminal [+]. Be careful not get the tool touching the positive terminal and chassis; otherwise, fire hazard may ensue.
- Loose contact of terminal may generate sparks, causing explosion.
- When removing or installing terminals, test which is the positive terminal [+], and which is the negative terminal [-].

ttery when achine. Alm the mapattery, alF to shut ays wear

Fig.6-13

6.4.3.2 Removal and refitting of battery

- Before disassembling battery, always disassemble earthing cable (normally connected to negative terminal [-]) first.
 If the tool touches between the positive terminal and chassis, fire disaster may occur.
- Use clamp to fix the battery when changing battery.
- Order of connecting battery wire: first connect the battery positive wire, then connect the battery negative wire.
 Order of disconnecting battery
- Order of disconnecting battery wire: first disconnect the battery negative wire, then disconnect the battery positive wire.



When charging the battery, any improper operation may lead to explosion. Always on according to the hatter cations, and do as follows:

- · Adjust the charger voltage to match the battery. If the wrong voltage is selected, the charger may go overheating, and cause explosion.
- Connect the charger positive terminal [+] to the battery positive terminal [+], and connect the charger negative terminal [-] to the battery negative terminal [-]. Always fix the clamp.
- Adjust the charging current to the 1/10 of the rated battery capacity; in case of fast charging, tune down the charging current under rated battery capacity. Overcurrent may lead to electrolyte leakage or vaporization, which will cause battery on fire or exploding.
- age different power to start the engine. Otherwise it will ignite the battery electrolyte and result in battery explosion. • If the battery electrolyte freezes, do not battery explosion.

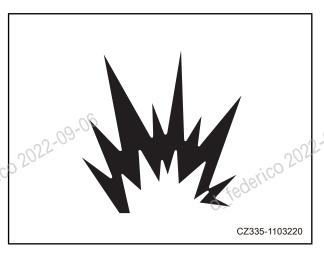


Fig.6-14

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

- When connecting the wires, do no let the positive terminal [+] contact the negative terminal [-].
- Avoid the contact between normal machine and failed machine, so as to prevent sparks being generated around the battery igniting the hydrogen released from the battery.
- Be careful not to make mistakes in connecting auxiliary wires. At the end of connection (i.e. connection with upper frame), sparks will come up, so you need to connect the wire as far away from the battery as possible. (But always avoid work equipment since it is not good conductor)
- When removing the auxiliary wire, be extremely careful not to let the wire clamps touch each other or contact the chassis.

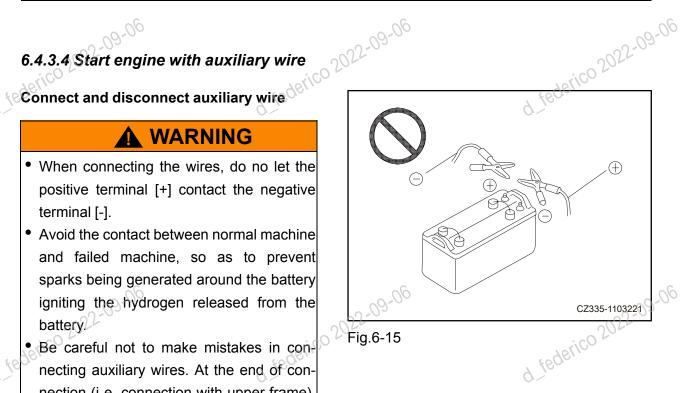


Fig.6-15

- The starting system adopts 24V voltage, is normally supplied by two 12V hard series.
- The specification of auxiliary wire and clamp should conform to the battery specification.
- The battery should have the same capacity with the engine which it will start.
- Check whether the wires and clamps are broken or corroded.
- Make sure the wires and clamps fixed well.
- of the two machine both at the "LOCK" position. position.
- Check whether all levers stay at the middle.



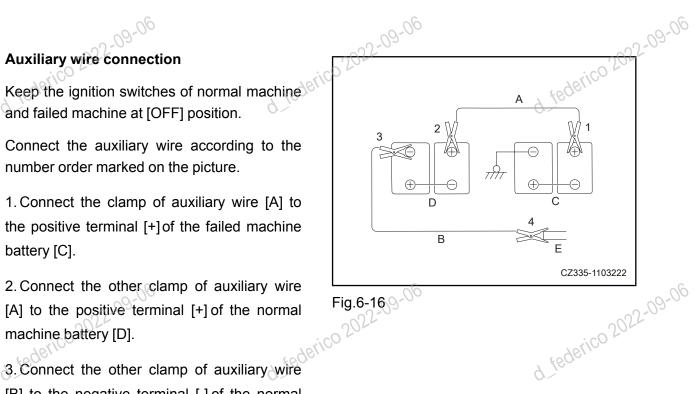
Connect the auxiliary wire according to the number order marked on the picture.

- 1. Connect the clamp of auxiliary wire [A] to the positive terminal [+] of the failed machine battery [C].
- 2. Connect the other clamp of auxiliary wire [A] to the positive terminal [+] of the normal machine battery [D].
- 3. Connect the other clamp of auxiliary wire [B] to the negative terminal [-] of the normal machine battery [D].
- 4. Connect the other clamp of auxiliary wire [B] to the failed machine swing frame [E].

Start the engine

CAUTION

- check the machine, and keep the safety lock control lever at the "LOCK" possition and check wheth No matter when the machine is operating neutral position.
- 1. Make sure that the clamps and battery terminals connected firmly.
- 2. Start the engine of a normal machine and
- chine to the "START" position and start the engine.



,derico 2022:





If the engine fails to start in first time, try again 2 minutes later.

Auxiliary wire disconnection

After the engine starting, disconnect the auxiliary wires in the reverse order of connecting them.

- 1. Disassemble a clamp of auxiliary wire [B] from swing frame of the failed machine [E].
- 2. Disassemble the clamps of auxiliary wire [B] from the battery [D] negative terminal [-] of the normal machine.
- 3. Disassemble the clamps of auxiliary wire [A] from the battery [D] positive terminal [+] of the normal machine.
 - 4. Disassemble the clamps of auxiliary wire [A] from the battery [C] positive terminal [+] of the failed machine.

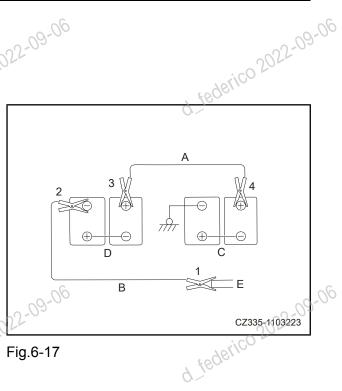


Fig.6-17

6.5 Hydraulic system fault

- When failures occur, please conduct examination according to the table below, and contact

Fault content	Fault Analysis	Measu
The work equipment moves slowly, or it has low traveling and rotation speed	 The main relief valve is improperly adjusted or fails Pilot relief valve failure Regulator fault Piston pump fault 	ReplacementReplacementRepair or replaceInspect and repair
Work equipment travel or swing failure	Fault of pilot pump relief valveHydraulic pump faultCoupler fault	ReplacementInspect and repaInspect and repa
The hydraulic pump has unusual noise	 The hydraulic oil level drops The hydraulic oil is poor Blocking of ventilator of the top cap of the hydraulic tank 	 Feeding with hyd Replace suitable Clean up or repla Clean up or repla

20-00	20.00	
Fault content	Fault Analysis	Measures
d federico zonan oonen	Blocking of filter screen of the hydraulic tank Piston pump fault	• Inspect and repair
Automatic idle speed failure	Sensor faultPilot valve failureController fault	ReplacementReplacementRepair or replace
Slow boom movement	 Right pilot valve (boom oil line) failure Pressure sensor fault Boom control valve (spool) failure Boom control valve (holding valve) failure Boom control valve (safety valve and refilling valve) failure or seal failure Boom cylinder fault 	 Inspect and repair Replacement Repair or replace Repair or replace Repair or replace Inspect and repair
Slow arm movement	 Left pilot valve (arm oil line) failure Pressure sensor fault Arm control valve (spool) failure Arm control valve (regeneration valve) failure Arm control valve (safety valve and refilling valve) failure or seal failure Arm cylinder fault 	 Inspect and repair Replacement Repair or replace Repair or replace Repair or replace Inspect and repair
Slow bucket movement	 Right pilot valve (bucket oil line) failure Pressure sensor fault Bucket control valve (spool) failure Bucket control valve (holding valve) failure Arm control valve (safety valve and refilling valve) failure or seal failure Bucket cylinder fault 	 Inspect and repair Replacement Repair or replace Repair or replace Repair or replace Inspect and repair
The single cylinder of the work equipment has no movement	 Pilot valve failure Pressure sensor fault Work equipment control valve (spool) failure 	Inspect and repairReplacementRepair or replace
Work equipment cylinder descending too much	 Work equipment cylinder failure Maintaining valve (boom, arm) failure Work equipment control valve (safety valve and refilling valve) seal failure Work equipment valve spool failure 	 Repair or replace Repair or replace Repair or replace Repair or replace

	00-00	20-00	00-00
	Fault content	Fault Analysis	Measures
d fe	The work equipment moves slowly	 Arm regeneration valve failure Failure of the control valve (safety valve and refilling valve) 	Repair or replace Repair or replace
	When single oil line overflows and other work equipments move	Failure of seal of the control valve	Replacement
	Swinging or traveling speed decreasing obviously	Straight travel valve fault	Repair or replace the
d fe	The machine has off-tracking during traveling	 Travel pilot valve failure Failure of pilot relief valve Regulator fault Seizure of proportional solenoid valve Seizure of traveling valve spool Seizure of hydraulic swivel Travel motor failure Fault of traveling pilot pressure sensor 	 Repair or replace Replacement Repair or replace Repair or replace Repair or replace Repair or replace Replacement
	Machine traveling slowly	 Travel pilot valve failure Failure of pilot relief valve Sensor fault Failure of traveling control valve (spool) Failure of traveling control valve (refilling valve) Travel motor fault 	 Repair or replace Replacement Replacement Repair or replace Repair or replace Inspect and repair
9.56	The machine is hard to turn or powerless	 Traveling pilot valve failure Failure of traveling pilot pressure sensor Failure of traveling control valve (spool) Failure of traveling control valve (refilling valve) Failure of travel motor (safety valve) Failure of travel motor (check valve) 	 Repair or replace Replacement Repair or replace
	The traveling speed cannot be shifted	Failure of high/low speed changeover solenoid valveTravel motor fault	Replacement Inspect and repair
9.66	It cannot travel (only on one side)	 Travel base valve failure Travel motor safety valve failure Travel motor balance valve failure Travel motor fault Fault of pilot pressure sensor 	 Repair or replace Repair or replace Repair or replace Inspect and repair Replacement

	20-010	20-00	00-00
9	Fault content	Fault Analysis	Measures
Swing failure of	Swing failure to left and right	 Failure of swing motor (parking brake) The swing valve (safety valve) is improperly adjusted or fails swing motor fault Upper structure fault 	 Inspect and repair Adjust, replace Inspect and repair Inspect and repair
machine	Swing failure in single direction	 Pilot valve failure Failure of the swing controlvalve (spool) Failure of seal of the swing motor (refilling valve) 	Repair or replaceRepair or replaceReplacement
d federico?	Poor acceleration performance or slow swing	 Failure of swing motor (parking brake) The swing valve (safety valve) is improperly adjusted or fails swing motor fault 	 Inspect and repair Adjust, replace Inspect and repair Unclog or replace the lin
Slow swing	Poor acceleration performance in single direction, or slow swing	 Pilot valve failure Failure of swing motor (pressure compensation valve) Failure of seal of the swing motor (refilling valve) Unilateral leakage of shuttle valve of the swing pilot pressure sensor 	 Repair or replace Repair or replace Replacement Repair or replace
Too large	Overswing in two directions	The swing valve (safety valve) is improperly adjusted or failsswing motor fault	Adjust, replace Inspect and repair
when swing stops	Overswing in single direction	 Pilot valve failure Failure of the swing control valve (spool) Failure of seal of the swing motor (refilling valve) 	Repair or replaceRepair or replaceReplacement
The impact	t is too large when swing	swing pilot valve failureFailure of swing damping valveFailure of swing relief valve	Repair or replaceRepair or replaceRepair or replace
The unusu	al noise is too loud when s	 Backpressure valve failure Failure of the swing valve (safety valve) Failure of swing motor (refilling valve) swing mechanical device fault 	Repair or replaceRepair or replaceRepair or replaceInspect and repair

	20.06	20.06	20.06
20224	Fault content	Fault Analysis	Measures
Excessive	When applying swing parking brake	Fault of the swing brake control pipeSwing motor (parking brake)	Inspect and repair Repair or replace
swing hydraulic drifting	When applying swing parking brake failure	 Failure of the swing control valve (spool) Fault of the swing motor (relief valve) Fault of the swing motor (refilling valve) 	Repair or replaceRepair or replaceRepair or replace

6.6 Other common faults

Fault content	Fault Analysis	Measures
Noisy structural member	 Looseness and unusual noise of fasteners Increasing end clearance between bucket and arm due to abrasion 	 Check and tighten up again Adjust the clearance to 1mm
Bucket tooth dropping in operation	 Deformation and weakness of bucket tooth pin spring after long-term use Mismatching of bucket tooth pin with tooth base 	Replace the bucket tooth pin
Track twist under the excavator	Loose trackSprocket running fast in front on the bumpy road	Tighten the trackGuide wheel running slow in front on the bumpy wheel
Running failure of fan	 Poor contact of electrics or connector Blowing rate switch, relay or temperature control switch damage Fuse breakage or low battery voltage 	Repair or replace
Small air volume with fan running normally	 Obstacle at intake side Poor heat transfer due to blockage of evaporator or condenser fin One of the fan impeller stuck or damaged 	Clean up Clean up Replace

	09-06	30.06			
Fault content		Fault Analysis	Measures	02	
Failed or difficult running of compressor		 Clutch engagement failure because of broken line and poor contact in electric circuit Undertensioning of compressor belt Coil breakage and failure of compressor clutch coil Too much or too littlerefrigerant 	 Repair Adjust compressor belt tension Replace clutch coil Adjust the filling amount of refrigerant 		
Coolant (fre medium) sh	(7/9)	Coolant leakage Coolant underfilling	Eliminate leaking pointAdd coolant as appropriate	09-0	
Readings of high and low pressure gauge in normal working condition		 When environment temperature High pressure reading: 1.47~1.6 Low pressure reading: 0.13 ~ 0. 	67MPa(15~17kgf/cm2)		
Low pressure above specified value	Frost attached on the surface of low pressure pipe	 Excessive opening width of expansion valve Poor contact of expansion valve sensing bulb Excessive coolant inside the system 	 Replace the expansion valve Properly mount the sensing bulb Drain some coolant to the specified amount 		
I federico?	Both high and low pressure below normal value	• Coolant shortage	Refill coolant to the specified amount.	09-0	
Low pressure below specified value	Negative pressure sometimes indicated on the low pressure gauge	Low pressure hose blocked, expansion valve blocked by ice or dirt	Repair the system, replace the liquid reservoir if blocked by ice		
	Evaporator freeze	Thermostat out of operation	Replace thermostat	. (
Frosting at inlet side of expansion valve		Expansion valve blocked Clean or replace the expansion valve		09-1	
Expansion valve inlet side not felt cold, but low pressure being negative sometimes		Air leakage of expansion valve sensing pipe or sensing bulb	Replace the expansion valve		

		00-00	20-00	20-0
	Fault	content	Fault Analysis	Measures
•	h ssure ve the	Both highand low pressure above normal value	Air mixed into circulation systemCoolant overfilling	 Drain away coolant, vacuum- ize again, and then add coolant Drain coolant as appropriate
	cified	Poor performance of condenser	Condenser blocked by dustCondenser fan damaged	Clean and unblock the condenserCheck and replace condenser fan
belo	ssure ow the cified	Both high and low pressure below the specified value, with low pressure being negative sometimes, and compressor and high pressure pipe overheating	 Insufficient refrigerant Low pressure pipeline blocked and damaged Internal failure of compressor 	 Repair, and refill with refrigerant as specified Clean and replace failed part Replace compressor
war	m air int	g effect due to fluence	Closing failure of heater valve due to damage	Replace heater solenoid valve
d federin	,0	_	d federico 202	d. federico



d federico 2º	322-09-06	d federico 2022-09-06	d federico 2022-09-06
derico 2	32-09-06	9 tege. 100 50 50 50 50 50 50 50 50 50 50 50 50 5	Jederico 2022-09-06
d federico 2	22-09-06	0. fe8erico 2222-09-06	0. federico 2022-09-06
d federico 2º	32-09-06	d federico 2022-09-06	d. federico 2022-09-06



Accessories and options

	9
7 Accessories and options	7-1
7.1 Safety precautions	7-3
7.2 Hydraulic control components and lines support	ting accessories7-5
7.2.1 Position of components	7-5
7.2.2 Hydraulic lines	7-6
7.2.3 Removal and installation of accessories	7-9
7.2.4 Replacement of hydraulic fluid and hydrau	ulic tank filter7-13
7.2.5 Long-term storage	
7.3 Combinations of work equipment	7-15
7.4 Recommended accessory operation	
7.4.1 General	
7.4.2 Hydraulic breaker	
7.4.1 General	
7.4.4 Forbidden operation 7.4.5 Greasing of hydraulic breaker	7-20
7.4.5 Greasing of hydraulic breaker	7-22
7.5 Quick coupler and control system	
7.5.1 Operation method of quick coupler	7-23
7.5.2 Precautions for safety operation of quick of	coupler 7-25
7.6 Refueling system	7-26
7.6.1 Introduction to refueling system	7-26
7.6.2 Composition of refueling system	7-27
7.7 Centralized lubrication system	7-27
7.7.1 System scheme and composition	7-27
7.7.2 System working principle	7-29
7.7.3 Lubrication time setting of electric grease	pump7-30
7.7.4 System technical specification	7-32
7.7.3 Lubrication time setting of electric grease 7.7.4 System technical specification	7-32

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

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 tederico 2022-09 this could result in death or serious injury.

d federico 202

federico 2022-09-06 7.Accessories and options

7.1 Safety precautions

d_federico 2022-09-06 Pay attention to safety while installing accessories or options on board. Please comply with the following precautions for selection, installation and use of accessories or options:

Precautions for selection

- Before installing accessories or options on board, please consult the agents authorized by Sany Heavy Machinery Co., Ltd. Depending on the type of accessory or option, front guard, overhead guard or other safety structures may be required to be installed on board additionally.
- Only accessories or options approved by Sany Heavy Machinery Co., Ltd. shall be installed. Sany Heavy Machinery Co., Ltd. will take no responsibility for the accident, damage or malfunc-Jederico 2022-1 tion caused by unapproved accessories or options.

Please read the Operation Manual carefully

- Before installing and using any accessories or options, be sure to read carefully and understand the contents of the corresponding Operation Manual.
 - If the Operation Manual was lost or damaged, you should ask the manufacturer of accessories or the agents authorized by Sany Heavy Machinery Co., Ltd. for a new one.

Precautions for removal and installation

Ensure safety while removing and installing accessories or options. Please comply with the following precautions:

- Remove and install the accessories or options in a flat and solid place.
- · When the cooperative work between two or more persons is required, one should be the commander and others follow his/her commands.
- Use the lift to carry the object over 25 kg. (The lift must be operated by qualified and experienced staff with official license.) It is forbidden to stay under the lifted object.
 - During removal and installation process, please don't use the machine while any object is being lifted. Please use a holder to avoid the object falling if necessary.
 - Before removing some heavy parts, consider the effect of the removal on the balance of the machine. To prevent rollover, the machine may be supported before removal of some heavy parts, if necessary.
 - Ensure the accessories or options to be installed or removed ones are stable and would not turn over.
 - As for more details about removal or installation, please consult the agents authorized by Sany Jederico 2022-0 federico 2022-0 Heavy Machinery Co., Ltd.

Precautions for use

Please keep in mind the following precautions while installing large or heavy accessories or options.

- Before operation, please move the machine to a safe place for trial operation and make sure that you have clearly known the movement, center of gravity and working range of the machine.
- Do not swing the machine if it is inclined; otherwise, the machine would be in the risk of turning over.
- In the process of operation, make sure to keep a safe distance from the machine to the surrounding obstacles. Please pay attention to the followings while installing heavy accessories or options
- The turning circle of heavy accessories or options may be large. Incorrectly calculating their turning circle could cause a risk of hitting other objects. Please reserve a large space for rotational motion.
- When the lifting process stops, the heavier the accessories or options are, the longer distance they will move downwards under their dead weight. Therefore do not stop them at the lifting position, but lower them down to the ground.
- Never swing, lower or stop the accessories or options abruptly to prevent the machine from turning over.
- Never extend or retract the boom cylinder abruptly to avoid machine rollover due to impact.

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

7.2 Hydraulic control components and lines supporting accessories

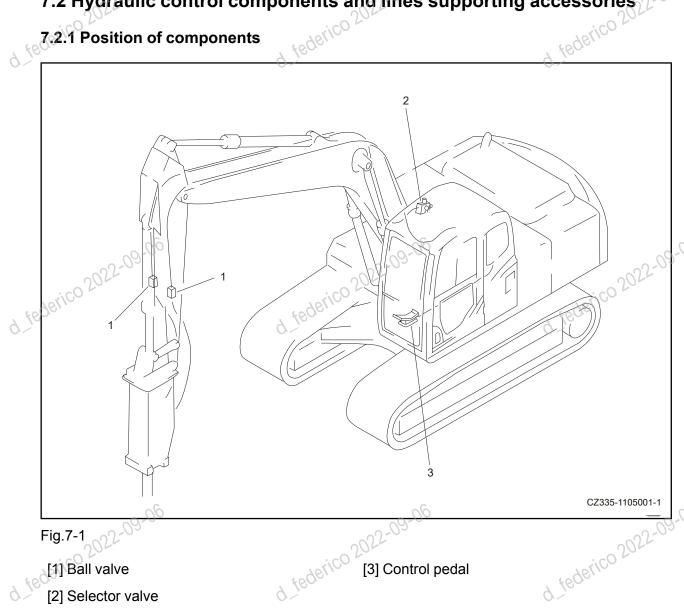


Fig.7-1

- [1] Ball valve
 - [2] Selector valve

[3] Control pedal

Ball valve[1]

Ball valve is used for controlling the flow of hydraulic fluid.

Position[A]: FREE, hydraulic lines ON

Position[B]: LOCK, hydraulic lines OFF

When removing or installing accessories, add federico 20 just this valve to LOCK position. d federice

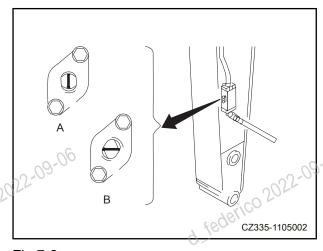


Fig.7-2

Selector valve [2]

Selector valve is used for switching the flow direction of hydraulic fluid.

This valve should be set based on the selected working mode, which must match the installed accessories.

For more details about working mode switching, see "Hydraulic lines" in Page 7-6.

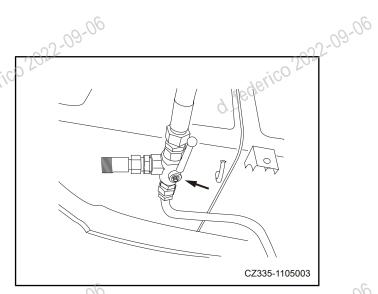


Fig.7-3

Control pedal [3]

Control pedal used for controlling accessories.

When the forepart and rear-part of the control pedal is depressed, the performance of the accessories is as follows:

 Hydraulic breaker Forepart of the pedal [A]: ON Rear-part of the pedal [B]: OFF

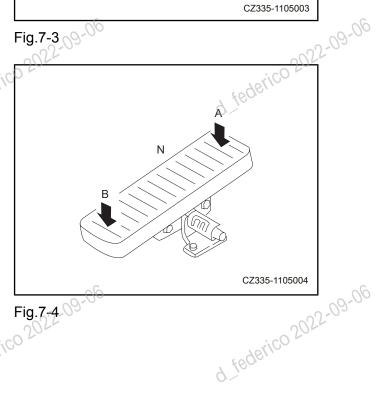


Fig.7-4

NOTE:

As for other accessories, please consult the manufacturers before installation to determine the operation of the pedal and accessories before use.

7.2.2 Hydraulic lines

When the machine is equipped with a hydraulic breaker, the return lines must lead to the return filter directly. Therefore, do not use return lines except for in mode B. When the hydraulic breaker pipeline is not pre-installed on the machine, if the user installs this pipeline by itself, the return pipeline must be provided with a filter. The pipeline of the hydraulic breaker and the filter must be verified by the agents authorized by Sany Heavy Machinery Co., Ltd, otherwise any subsequent consequences shall be borne by the user.

The standard set pressure of the relief valve in the service valves has already been set when the machine was delivered from the factory. For Mode B, it is set as 20.6 MPa (210 kgf/cm2, 2980 PSI); for hydraulic shear mode, it shall be set as 27.4 MPa (280 kgf/cm2, 3980 PSI). Depending on the type of accessories, it may need to be adjusted. In case of that, please contact the agents aud federico 2 thorized by Sany Heavy Machinery Co., Ltd for adjustment.

Switching of hydraulic lines

- Depending on the type of accessories, set the working mode in the display screen in accordance with the following standard.
- The set pressure of the relief valve in the service valves and the switch of the hydraulic lines is specified as per the selected working mode.

Accessories	Working mode	Hydraulic lines	Set pressure of relief valve in service valves
Accessories of No. 1 hydraulic line, e.g. hydraulic breaker	Mode B	The hydraulic line automatically forms at the point where the return line doesn't lead to the control valve.	When delivered from the factory: 20.6Mpa (210kgf/ cm2、2980 PSI)
Accessories of double acting hydraulic line, e.g. hydraulic shear	Mode S	The hydraulic line automatically forms at the point where the return line leads to the control valve.	When delivered from the factory: 27.4 MPa (280 kgf/ cm2、3980 PSI)

Switch between hydraulic breaker and general accessories

- When optional accessories are installed and Mode B is set as the working mode
 - federico 2022-09-06 1. When optional accessories are installed and Mode B is set as the working mode
 - 2. Overflow valve is set to low pressure.

When delivered from the factory: 20.6 MPa (210 kgf/cm2, 2980 PSI)

- When optional accessories are installed and Mode S is set as the working mode
 - 1. The hydraulic line of the hydraulic shear (double acting hydraulic line) forms.
 - 2. Overflow valve is set to high pressure.

When delivered from the factory: 27.4 MPa (280 kgf/cm2, 3980 PSI)







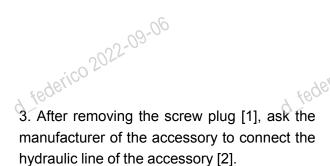
Connection of hydraulic lines

When connecting accessories, please connect the hydrovits " nect the hydraulic lines as per the following steps.

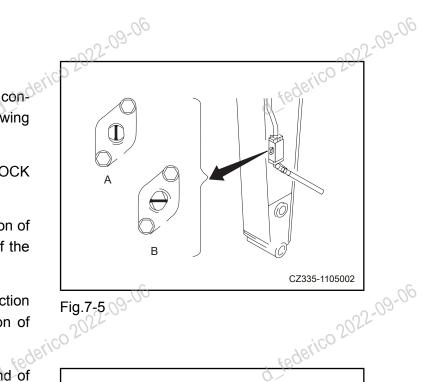
- 1. Check whether the ball valve is in LOCK position [B].
- [A] FREE: Hydraulic lines ON (the direction of arrow is parallel to the length direction of the arm)
- [B] LOCK: Hydraulic lines OFF (the direction of arrow is vertical to the length direction of the arm)
- 2. Remove the screw plugs [1] at the end of the ball valve pipeline (one on the left and one on the right).

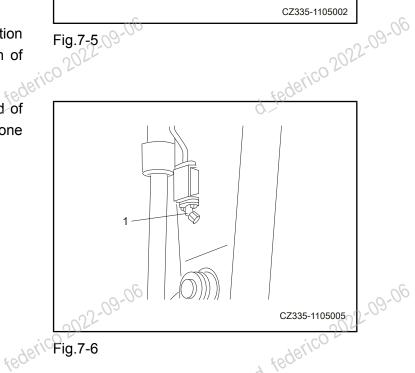
NOTE:

Do not lose or damage the removed parts.



As for the dimensions of the connector and the added accumulator, different manufacturers require different measures. Therefore please contact the dealers authorized by Sany Heavy Machinery Co., Ltd. Jederico 2022-09-06





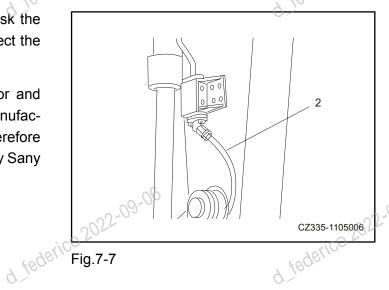


Fig.7-7

Flow path of hydraulic fluid

The operation direction of the pedal and the flow path of hydraulic fluid are as shown below. d. federico 2022-09-06 d. federico 2022-09 CZ335-1105007

Fig.7-8

When the forepart of the pedal is depressed, the hydraulic fluid will flow to the left pipeline of the work equipment; when the rear part of the pedal is depressed, the hydraulic fluid will flow to the right pipeline of the work equipment. (When a hydraulic breaker is installed, only the forepart of the pedal works.)

7.2.3 Removal and installation of accessories

Removal of accessories

- 1. Lower down the work equipment to the ground and shut down the engine.
- 2. Turn the ignition switch to [ON] position, then set the safety lock control lever to "UN-LOCK" position.
- 3. After finishing step 2, fully operate two joysticks frontward, rearward, leftward and rightward in 15 seconds and step on the accessory control pedal 2-3 times to release the internal pressure in the hydraulic lines.

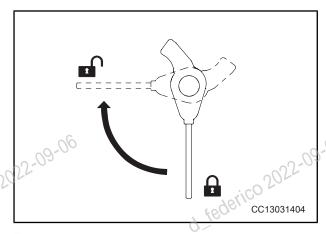


Fig.7-9

4. Turn the safety lock control lever to "LOCK" position.C

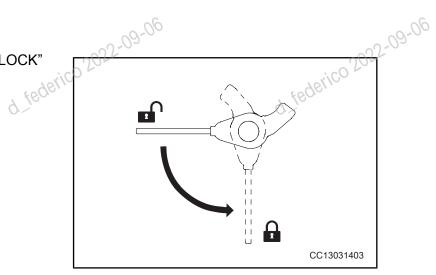


Fig.7-10

5. The internal pressure in the hydraulic lines will be released through the breather valve [F] at the top of the hydraulic tank.

To release all pressure, rotate and open the butterfly nut of the breather valve [F] and press the release button to release pressure.

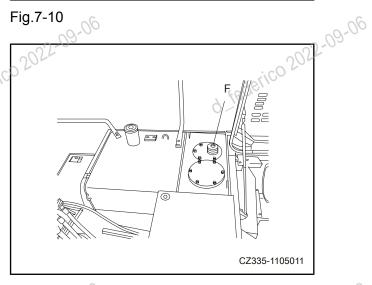
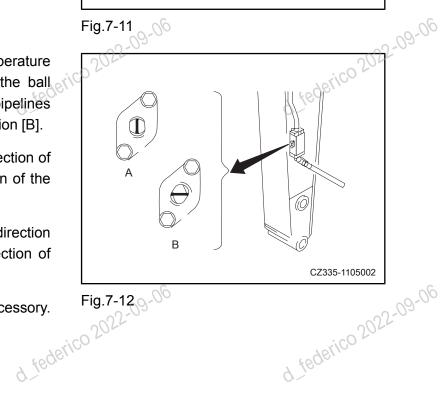


Fig.7-11

- 6. Check that the hydraulic fluid temperature has declined, and turn the rotor of the ball valve (installed at the outlet and inlet pipelines at the side of the arm) to "LOCK" position [B].
- [A] FREE: Hydraulic lines ON (the direction of arrow is parallel to the length direction of the arm)
- [B] LOCK: Hydraulic lines OFF (the direction of arrow is vertical to the length direction of the arm)
- 7. Remove the hose at the side of accessory. Install the screw plugs at two outlets. d federica



The screw plugs are used for avoiding incorrect operation of the accessories of the entry of facility NOTE :: 22-09-06 rect operation of the accessories caused by the entry of foreign matters. After correct installation of the screw plugs, the accessories shall be preserved.

8. Pull out the mounting pins (at 2 points), remove the accessories and install the bucket.

As for more detail about installation steps of the bucket, please see "Replacement of bucket" in Page 5-26.

d federico 29 9. After installing the bucket, check the fluid level in the hydraulic tank.

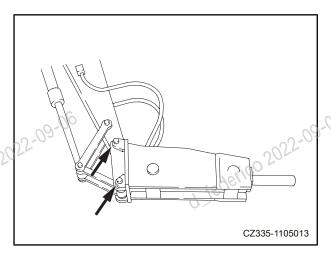


Fig.7-13

Installation of accessories

- 1. Remove the bucket.
- 2. Place the accessory horizontally, set pin [A], and then use pin [B] to install the accessory to the arm.
- 3. Lower down the work equipment to the ground and shut down the engine.

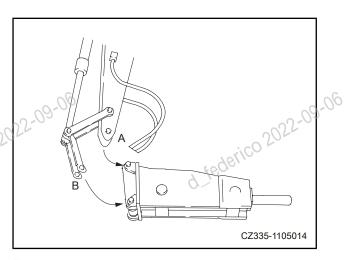


Fig.7-14



d federico 2022-09-06

- 4. Turn the ignition switch to [ON] position, then set the safety lock control lever to "UN-LOCK" position.
- 5. After finishing step 2, fully operate two joysticks frontward, rearward, leftward and rightward in 15 seconds and step on the accessory control pedal 2-3 times to release the internal pressure in the hydraulic lines.

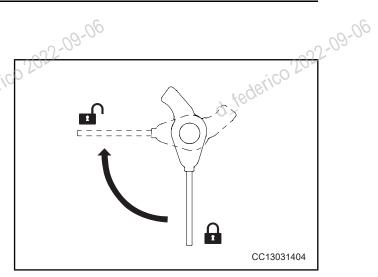


Fig.7-15

6. Turn the safety lock control lever to "LOCK" position. d tede

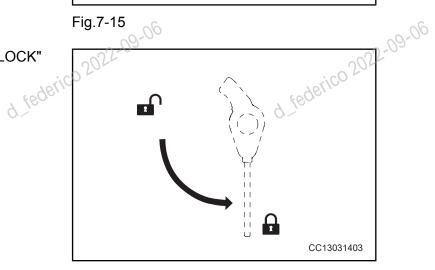
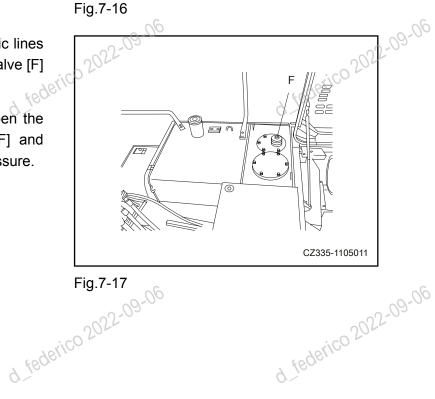


Fig.7-16

7. The internal pressure in the hydraulic lines will be released through the breather valve [F] at the top of the hydraulic tank.

To release all pressure, rotate and open the butterfly nut of the breather valve [F] and press the release button to release pressure.



8. Check that the hydraulic fluid temperature has declined, and remove the screw of from the outlet and inlet respectively. Pay attention to avoiding any dust or dirt affixed to the connection of the hose.

If the O-ring is damaged, replace it with a new one.

9. Connect the hose at the side of the accessory.

During connection, check that the hydraulic fluid flows in correct direction.

- 10. Set the rotors of the ball valves installed at the inlet and outlet pipelines at the side of the arm to FREE position [A].
 - [A] FREE: Hydraulic lines ON (the direction of arrow is parallel to the length direction of the arm)
 - [B] LOCK: Hydraulic lines OFF (the direction of arrow is vertical to the length direction of the arm)
 - 11. After installing the accessory, check the fluid level of the hydraulic tank.

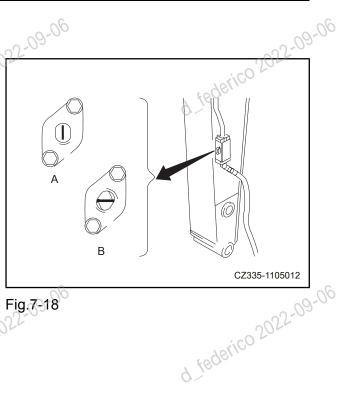


Fig.7-18

irico 2022-09-06 7.2.4 Replacement of hydraulic fluid and hydraulic tank filter

d_federico 2022-09-06 The operation of the hydraulic breaker will accelerate the pollution of the hydraulic system and the degradation of hydraulic fluid. Therefore, compared with the machine equipped with the bucket, the machine with hydraulic breaker requires frequenter replacement of hydraulic fluid and hydraulic tank filter. Failure to observe this may cause damage to the hydraulic breaker, hydraulic pump and other parts of the hydraulic system. Recommended replacement interval is as follows. (As for the replacement method of the filter element and the hydraulic fluid, see the Section "Maintenance".)

Replacement interval (unit: hour)

100 2022-0	Machine with hydraulic breaker	Machine with general bucket		
Hydraulic oil	1600 e00	1500 or 2000 or 4000		
Filter element	100	1000		



NOTE:

- 2022-09-06 The data in the table above are based on the 100% operation time of the hydraulic breaker. When the operation time of the hydraulic breaker declines, the replacement interval could be prolonged as shown below.
- After continuous operation of the hydraulic breaker for 100 hours, the filter element must be replaced.

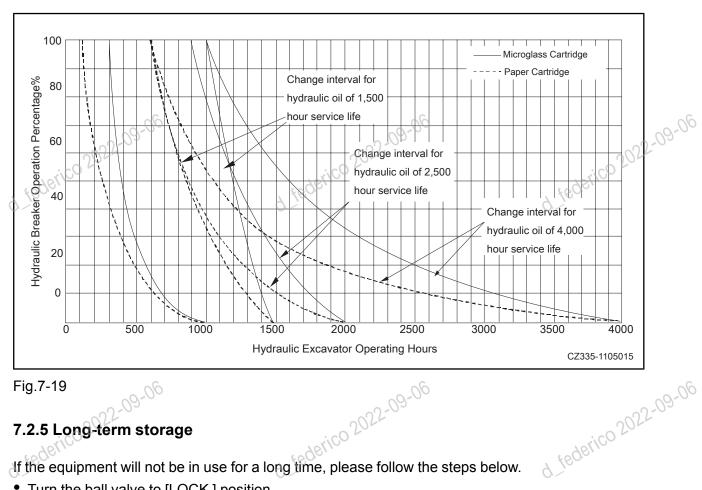


Fig.7-19

7.2.5 Long-term storage

If the equipment will not be in use for a long time, please follow the steps below.

- Turn the ball valve to [LOCK] position.
- Install the screw plug on the valve.
- Turn the lock pin to [LOCK] position.

If no hydraulic breaker or general accessory is installed on the machine, overheating or other issues may arise during operation of the pedal.







2022-09-06

7.3 Combinations of work equipment

CAUTION

- Different types or combinations of work equipment may lead to the danger of colliding with the cab or body of the machine.
- Before using unfamiliar work equipment for the first time, please check for any risk of interference and be careful to operate the equipment.

SY195/SY205/SY215/SY225C9

The accessory combinations that can be attached to long arm (standard) and short arm are listed in the table below.

NOTE : 100

- In case the machine is equipped with a long arm, the arm will interfere with the machine body if the bucket is retracted toward the machine body, so please operate the long arm carefully.
- During the excavation on a slope, the boom will interfere with the lower structure if the boom is fully lowered, so please operate the boom carefully.
- For excavating or loading hard soil or soft rock-filled soil, a reinforced rock bucket with high strength and high wear resistance is recommended.
 - *: Side edge plate is equipped.

Bucket name	Capacity m3 (cu. yd)	Outside width mm (ft in)	Weight Kg (lb)	Standard arm 2.7/2.9 m (Note) (8'10"/ 9'6")	Short arm 2.5 m (7'11")	Short arm 1.8 m (5'11")
	0.48 (0.62)	600 (2')	574.7 (1267.3)	♦	*	♦
	0.7 (0.83)	964 (3' 3")	760.6 (1673.3)	♦	♦	♦
* Rock bucket	0.8 (1.04)	1,000 (3' 4")	783.6 (1723.9)	♦	*	♦
	0.9 (1.18)	1,154 (3' 10")	846.1 (1692.2)	♦	*	♦
022-0	1.2 (1.56)	1,469 (4' 10")	950.9 (2091.9)	8-06 ×	×	∆ 2022-09:
General	0.8 (1.04)	1,084 (3' 7")	680 (1496)	0	0 480	erico 2022
bucket	0.9 (1.18)	1,137 (3' 9")	710.1 (1562)	0	0	0



	00-06			09-06	09.00		
Bucket name	Capacity m3 (cu. yd)	Outside width mm (ft in)	Weight Kg(lb)	Standard arm 2.7/2.9 m (Note) (8'10"/ 9'6")	Short arm 2.5 m (7'11")	Short arm 1.8 m (5'11")	2-03
	1.0 (1.3)	1,240 (4' 1")	777.9 (1709.4)	×	*	*	'
Earthmov ing bucket	1.1 (1.43)	1370 (4' 7")	837.1 (1841.6)	×	0	0	

NOTE:

d_federico 2022-09-06 The standard arm for SY195C9 model is 2.7 m, and for SY205/215C9 model is 2.9 m.

- —For loading materials with a specific gravity≤1.2 t/m3.
- △—For digging or loading materials with a specific gravity≤1.2 t/m3.
- o—For digging or loading materials with a specific gravity≤1.5 t/m3.
- ×-Not applicable

SY235/SY245/SY265C9

- During the excavation on a slope, the boom will interfere with the lower structure if the boom is fully lowered, so please operate the boom carefully
- For excavating or loading hard soil or soft rock-filled soil, a reinforced rock bucket with high strength and high wear resistance is recommended.
 - *: Side edge plate is equipped.

Bucket name	Capacity m3 (cu. yd)	Outside width mm (ft in)	Weight Kg (lb)	Standard arm 2.95 m (9'7")	Short arm 2.5 m (8'2")	Short arm 2.1 m (6'7")
Earthmov ing bucket (235C-9)	1.19 12 (1.44)	1,420 (4' 8")	924.2 (2038)	2-09-06	0	0 2022-
* Rock bucket (SY235C- 9)	1.2 (1.56)	1,300 (4' 3")	1009 (2224)	0	۰ ٥	tegering

00

20-0				00-		~O\-
Bucket	Capacity m3 (cu. yd)	Outside width mm (ft in)	Weight Kg (lb)	Standard arm 2.95 m (9'7")	Short arm 2.5 m (8'2")	Short arm 2.1 m (6'7")
* Rock bucket (SY265C- 9)	1.3 (1.69)	1448 (4' 9")	1297 (2859)	0	0	0
Rock bucket (SY245)	1.25 (1.64)	1342 (4'5")	1230.4 (2713.2)	0	0	0
Rock bucket (SY245)	1.35 (1.77)	1422 (4'8")	1267.1 (2794.1)	9-06	0	erico 2022-09
Earthmov ing bucket (SY245)	1.3 (1.70)	1502 (5')	1212 (2672.6)	0	od ted	0

00

- —For loading materials with a specific gravity≤1.2 t/m3.
- △—For digging or loading materials with a specific gravity≤1.2 t/m3.
- o—For digging or loading materials with a specific gravity≤1.5 t/m3.
- irico 2022-09-06
- ×—Not applicable

7.4 Recommended accessory operation

7.4.1 General

During operation of the hydraulic excavator equipped with accessories, following specifications must be complied with.

NOTE:

The type of applicable accessories or the model of special accessories depends on the model of the hydraulic excavator. Therefore, as for the selection of the related accessories, please contact d federico 2022-09 the agents authorized by Sany Heavy Machinery Co., Ltd. d federico 20 d federico 21

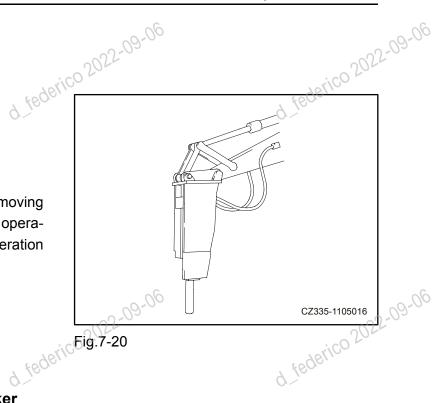


7.4.2 Hydraulic breaker

Main purposes:

- Rock crushing
- Removal operation
- Road project

This accessory is widely used for removing buildings, crushing road or slag, tunnel operation, rock crushing and the crushing operation in quarry.



d_federico 2022-09-06 7.4.3 Operation of hydraulic breaker

1. When conducting crushing operation, tightly press the drill rod vertically on the surface of the target object.

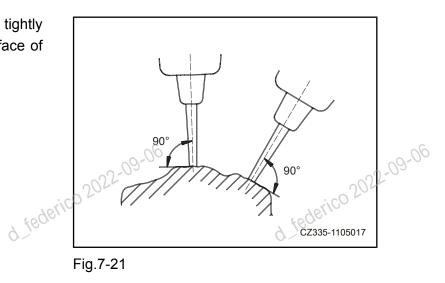


Fig.7-21

2. When applying impact, press the drill rod on the impact surface, leaving the forepart of the lower structure about 5 cm (2 in) above the ground, as shown on the right. Don't leave the machine more than that value above the ground.

NOTE:

Don't lift the excavator too high.

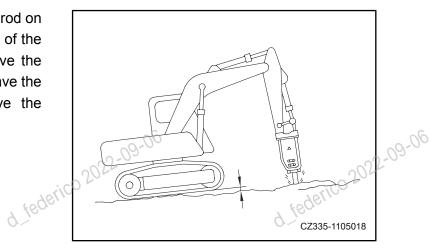


Fig.7-22



3. During application of continuous impact to the same surface, if the drill rod is upoble to place. pierce or crush the surface, change the impact part and conduct crushing again on the part near the edge.

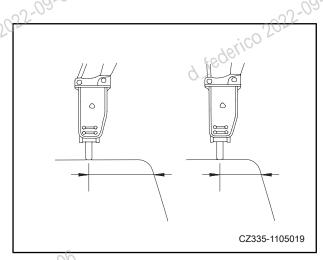


Fig.7-23

4. The piercing direction of the drill rod will gradually be out of line with the direction of the body of the hydraulic breaker. Adjust the bucket cylinder to align them.

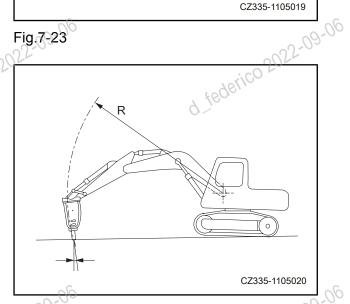
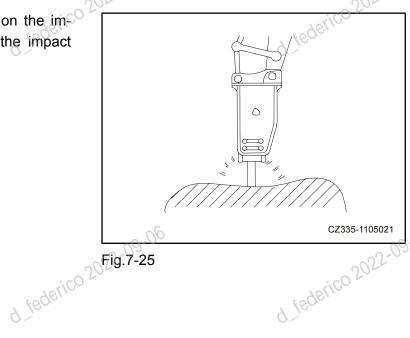


Fig.7-24

2022-09-06 5 Consistently press the drill rod on the impact surface properly to prevent the impact without resistance.

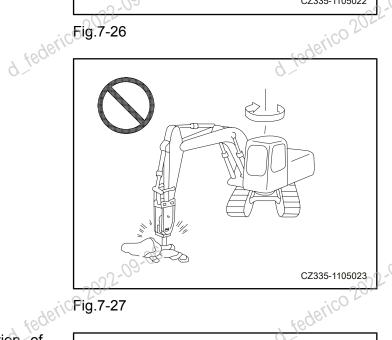


To ensure long service life and safe operation of the machine, do not operate the machine.

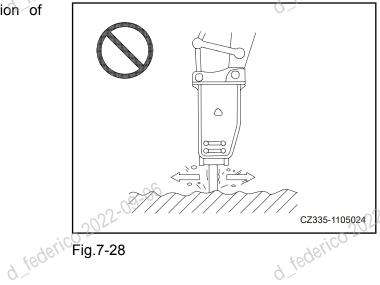
- Do not operate all the cylinders to the end of the stroke. Make sure to keep a distance of about 5 cm (2 in).
- 1. Accumulate the rocks and stones by the hydraulic breaker.



Bderico 2022-09-06 2. Operate with swing force



federico 2022-09-06 3. Move the drill rod during application of impact.



4. Keep the drill rod horizontal or upward during application of impact. ing application of impact.

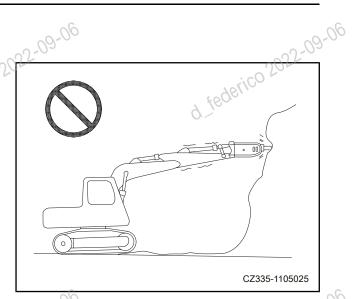
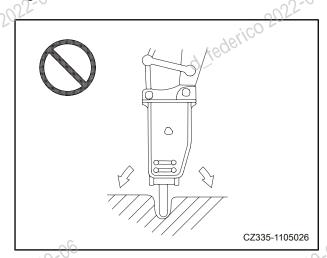
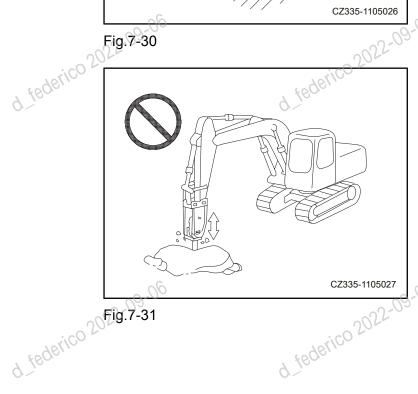


Fig.7-29

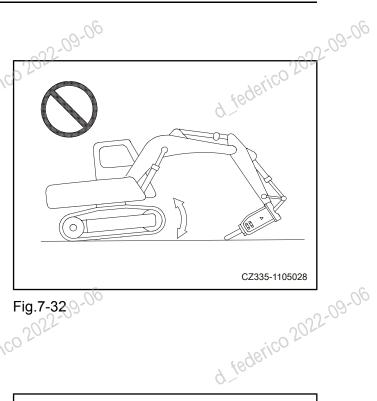
5. Swing the drill rod when the rock has been pierced.



6. Pecking operation.



7. Lift the machine away from the ground by d federic totally extending the bucket cylinder.



rico 2022-09-06

7.4.5 Greasing of hydraulic breaker

Add grease to the hydraulic 'right place' right place (as shown).

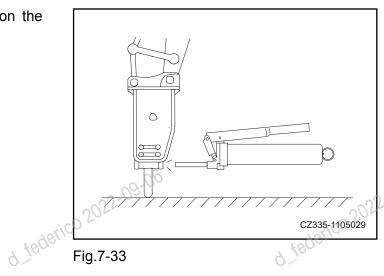


Fig.7-33

d_federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

- Incorrect greasing operation may cause excessive grease. As a result, soil and enter the bude. NOTE 222-09-06 operation of hydraulic breaker, the hydraulic parts will be damaged.
- Therefore, make sure to add grease to the breaker kept in right position.

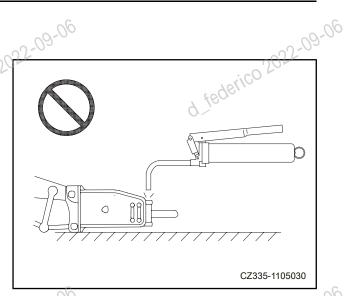


Fig.7-34

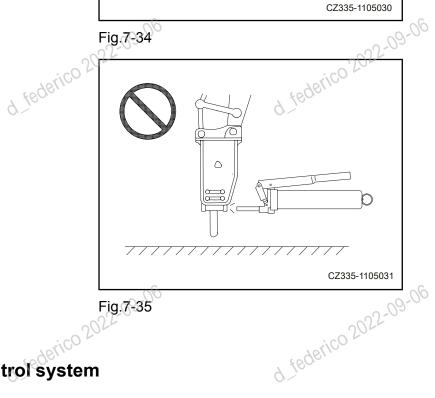


Fig.7-35

derico 2022-09-06 7.5 Quick coupler and control system

7.5.1 Operation method of quick coupler

1. Take out the safety shaft of the quick coupler, as shown on the right.

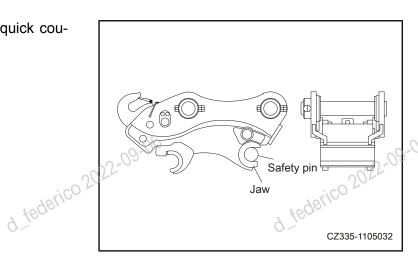


Fig.7-36



2. Press the quick coupler switch [1] (self-reset type) on the left joystick to close the moving and fixed jaws slowly.

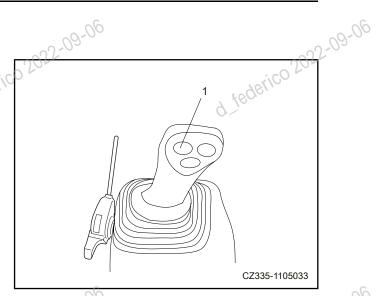


Fig.7-37

3. Make the fixed jaw of the quick coupler catch the bucket shaft [2] slowly, as shown on the right.

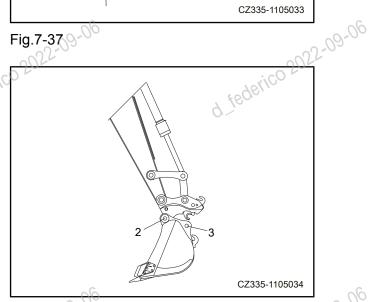
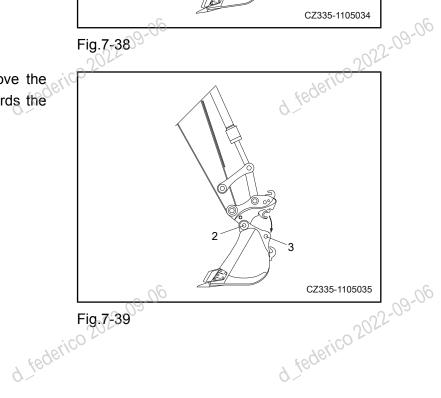


Fig.7-38

2022-09-06 4. Extend the bucket cylinder and move the moving jaw of the quick coupler towards the bucket shaft [3] slowly.



- 5. Allow the jaw of the quick coupler to get stuck with the bucket shaft [3] totally.
- 6. Loosen the guick coupler switch to make the quick coupler get stuck with the bucket shaft, and conduct other operation.
- 7. Loosen the guick coupler switch to make the quick coupler get stuck with the bucket shaft, and conduct other operation.

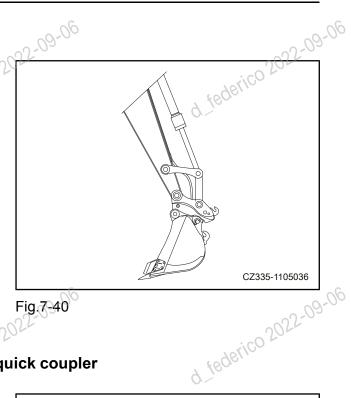


Fig.7-40

ico 2022-09-06 7.5.2 Precautions for safety operation of quick coupler

- 1. Due to installation of the quick coupler, the turning radius will be longer when the bucket and other connecting parts are operating. It is possible that these parts would collide with the cab or the boom of the excavator. Therefore please operate with care. Due to installation of the quick coupler, please retract the bucket (with the bucket cylinder fully extended) before the arm. Never operate the bucket when the arm has been retracted to the right position (with the arm cylinder fully extended) to prevent collision with the boom.
 - 2. Overload operation will damage the part connected to the guick coupler and the excavator, thus reducing the service life of the machine.

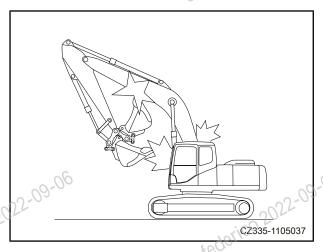


Fig.7-41

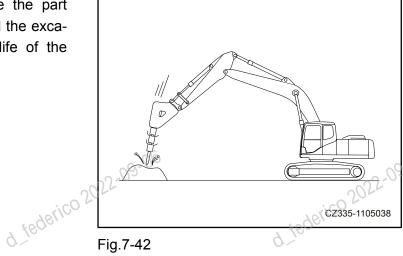


Fig.7-42



3. Do not exert pressure when the quick coupler contacts the ground. Please check that the quick coupler is connected to the bucket or other part during operation.

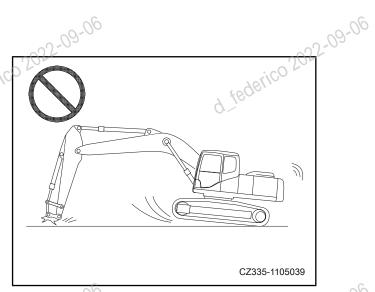
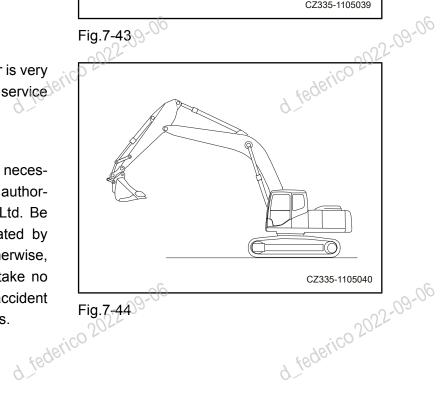


Fig.7-43

1022-09-06 4. Moving a weight by the quick coupler is very dangerous and may also reduce the service life of the coupler.

NOTE:

If the installation of the quick coupler is necessary, please consult the local dealers authorized by Sany Heavy Machinery Co., Ltd. Be sure to use the accessories designated by Sany Heavy Machinery Co., Ltd. Otherwise, Sany Heavy Machinery Co., Ltd will take no responsibility for any malfunction or accident caused by any unapproved accessories.



7.6 Refueling system

7.6.1 Introduction to refueling system

SANY large excavator is equipped with refueling system as a standard configuration. The system operates with the refueling pump assembly. Being powered by the vehiclemounted battery, the refueling pump assemd.federico 2022-09-06 bly is free from the limits of the area and power supply, thus having greatly enhanced work efficiency, increased economic benefit and reduced labor intensity.



97

d_federico 2022-09-06

The refueling volume of different types of machine is shown in the "Capacity table" in Page 5-12. 5-12.

7.6.2 Composition of refueling system

- The refueling system of SANY large excavator is mainly composed of: refueling pump assembly (including related pipelines and valves) and control switch.
- Open the battery box cover [1] to find the control switch [2] and the refueling pump d federico 2022

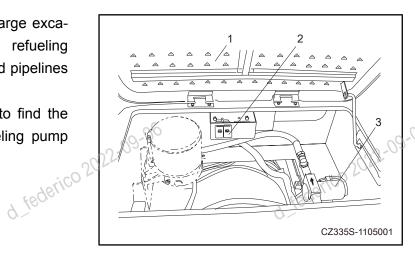


Fig.7-45

The main part of the refueling pump [3] is as shown on the right.

Main performance parameters of refueling pump

Pump flow	46L/min		
Rated voltage	24V		
Rated speed	2800rpm		
Connector thread specification	3/4'G		
Weight	3.5kg		
Package dimension	215×120×160mm		

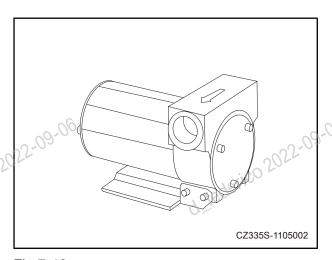


Fig.7-46

7.7 Centralized lubrication system

7.7.1 System scheme and composition

d_federico 2022-09-06 1. The distribution diagram of the lubrication points in the excavator is shown as follows: d federi



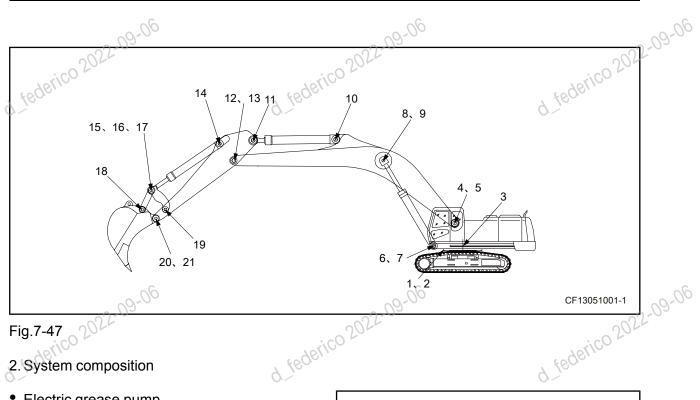


Fig.7-47

2. System composition

Electric grease pump

Open the left door; the electric grease pump assembly [1] is installed at the rear of the cab of the machine as shown on the right.

Open the left door; the electric grease pump assembly [1] is installed at the rear of the cab of the machine as shown on the right. d federico 2022-09-

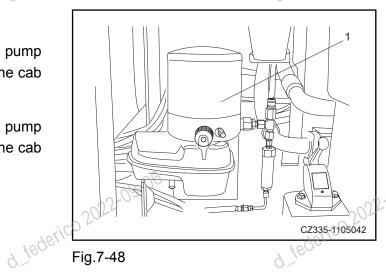


Fig.7-48

Distributor

The distributor mainly consists of:

Primary distributor (1 piece)

MX-F3/3

Secondary sub-distributors (3 pieces)

MX-F3/5 2022-09-06

MX-F3/4

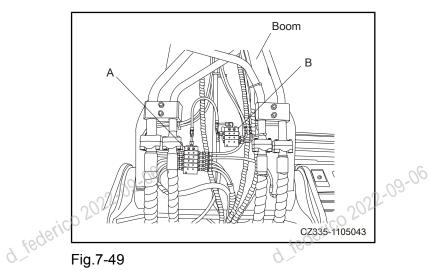


Fig.7-49

The primary distributor [A] installed at the root of the boom and the secondary sub-distributor [B] are as shown on the right [B] are as shown on the right.

The secondary sub-distributor[C] installed on the arm is as shown.

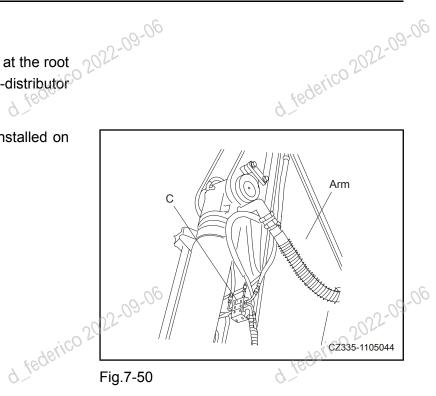


Fig.7-50

The sub-distributor [D] installed in the inside of the link is as shown.

Main pipeline

d federico 2022-09-06

The main pipeline of the system consists of high pressure hose, straight fitting, elbow fitting, straight core, bent core, wire protective jacket, hose protective jacket, and bucket disd federico 20 tributor protective plate. d federico

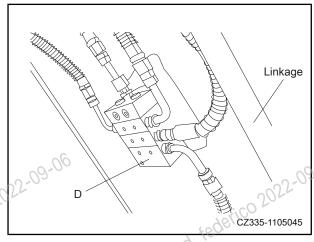


Fig.7-51

7.7.2 System working principle

Considering the lubrication points of SY series excavator of Sany Heavy Machinery Co., Ltd are centralized and tightly spaced, a progressive centralized lubrication system structured as shown below is adopted.

Working principle pressure grease from the electric plunger pump is delivered through the pump unit, the relief valve and the filter to the primary distributor, and then the grease from the main distributor is delivered through the grease transfer pipe branch to three secondary sub-distributors. Afterwards, certain amount and proportion of grease is supplied to the following lubrication points successively.

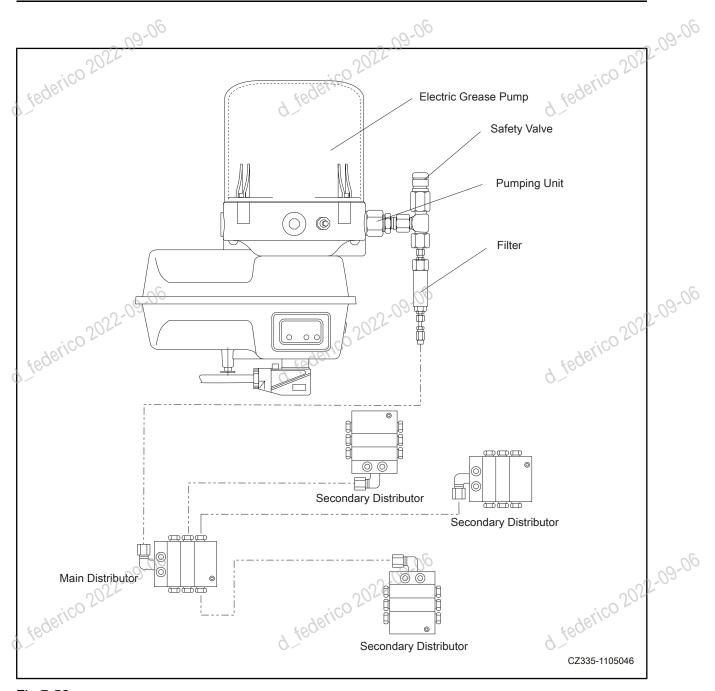


Fig.7-52

7.7.3 Lubrication time setting of electric grease pump

The integrated electric controller in the electric grease pump is able to control the time or period of the centralized lubrication system. At time programming control mode, after the power of the excavator is on, the indicator light of the centralized lubrication system in the cab will flash intermittently, and the yellow LED indicator light of the electric controller will be on for 25 seconds, which indicates it is ready for operation.

When the start button on the motor casing or the dash board is pressed, the lubrication period will begin. After the lubrication period, the motor of the lubrication pump will be shut down, and the halt time begins. All follow-up lubrication operations will begin in accordance with the pre-set time

programs. If the electric motor is shut down in halt time or lubrication time period, the period will be terminated and the time will be saved. When it starts again, the operation process will continue based on the time saved during the last operation. In the interrupted lubrication period, the forced start button can be pressed to start the lubrication pump at any time. Once the control device is connected, a lubrication period will start. The panel of the grease pump electric controller is as shown below

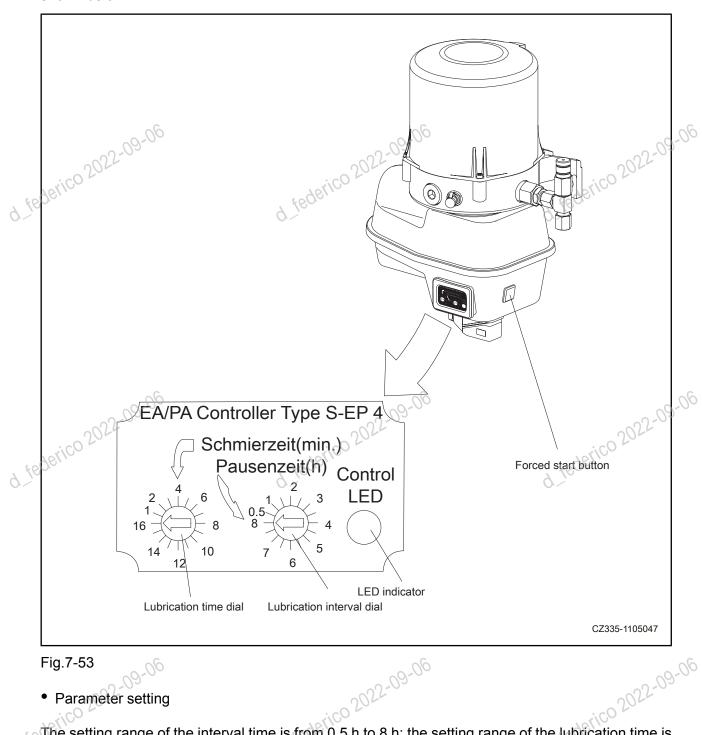


Fig.7-53

Parameter setting

The setting range of the interval time is from 0.5 h to 8 h; the setting range of the lubrication time is from 1 min to 16 min, as shown below.

If high speed time is necessary, remove the red rim with a slotted screwdriver, loosen four cross-head screws, and then remove the transparent cape success. water may come into the control unit and cause damage.

Fig.7-54

7.7.4 System technical specification

- 1. The default setting of the lubrication interval time is 0.5 h, and that of lubrication time is 10 min.
- 2. After 100 h operation, the lubrication time may be adjusted (increased or decreased) based on the actual conditions, but the lubrication interval time can't be changed.
- 3. Clean NLG12# lithium grease is recommended as the lubricating grease.
- 4. (24V/DC, 19kg) electric lubrication pump with the built-in electric controller is applied.

7.7.5 Refilling method of electric grease pump

federico 2022-09-06 The refilling methods of this electric grease pump of the centralized lubrication system include the following 3 methods.

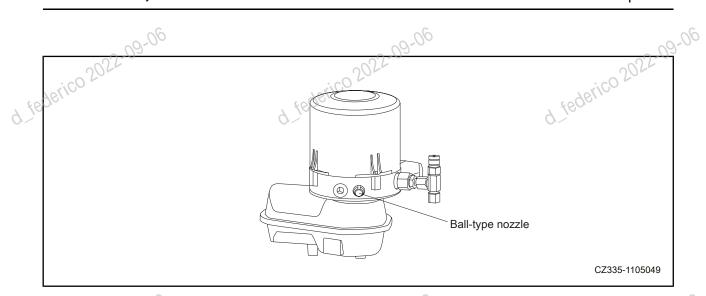
1. Standard method:

Refilling through the ball nozzle by manual or pneumatic gun as shown below.









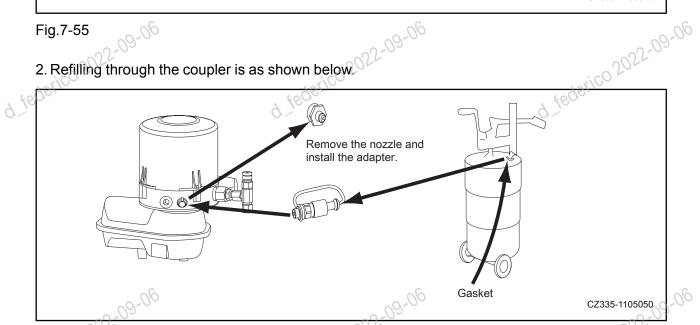


Fig.7-56

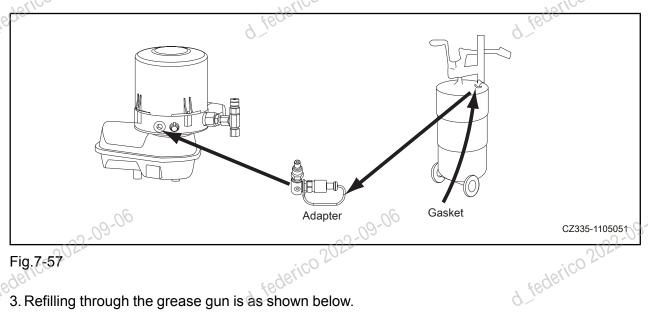
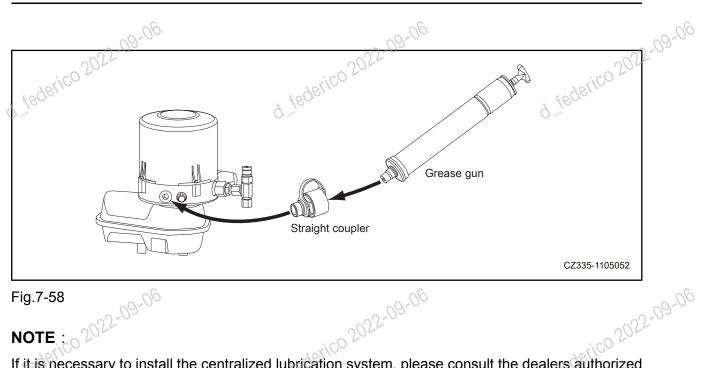


Fig.7-57

Fig.7-57

3. Refilling through the grease gun is as shown below.



NOTE: 2022-09-06 If it is necessary to install the centralized lubrication system, please consult the dealers authorized by Sany Heavy Machinery Co., Ltd. Be sure to use the accessories designated by Sany Heavy Machinery Co., Ltd. Otherwise, Sany Heavy Machinery Co., Ltd will take no responsibility for any malfunction or accident caused by any unapproved accessories.

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

d federico 2022-09-06

d. federico 2022-09-06

d_federico 2022-09-06

d federico 2022-09-06

d federico 2022-09-06

d_federico 2022-09-06

d_federico 2022-09-06

d. federico 2022-09-06

www.sanygroup.com

d federico 2022 de

d_federico 2022-09-06

d federico 2022-09-06

SANY Sany Heavy Industry Co, Ltd

Sany Heavy Machinery Industrial Park, Xinyang Road, No.1831, Fengxian District,

Shanghai, China

Zip code: 201413

Service hotline: 4008 28 2318

Inquiring and Complaint Number: 4008

87 9318

http://www.sanygroup.com

