Table of Contents

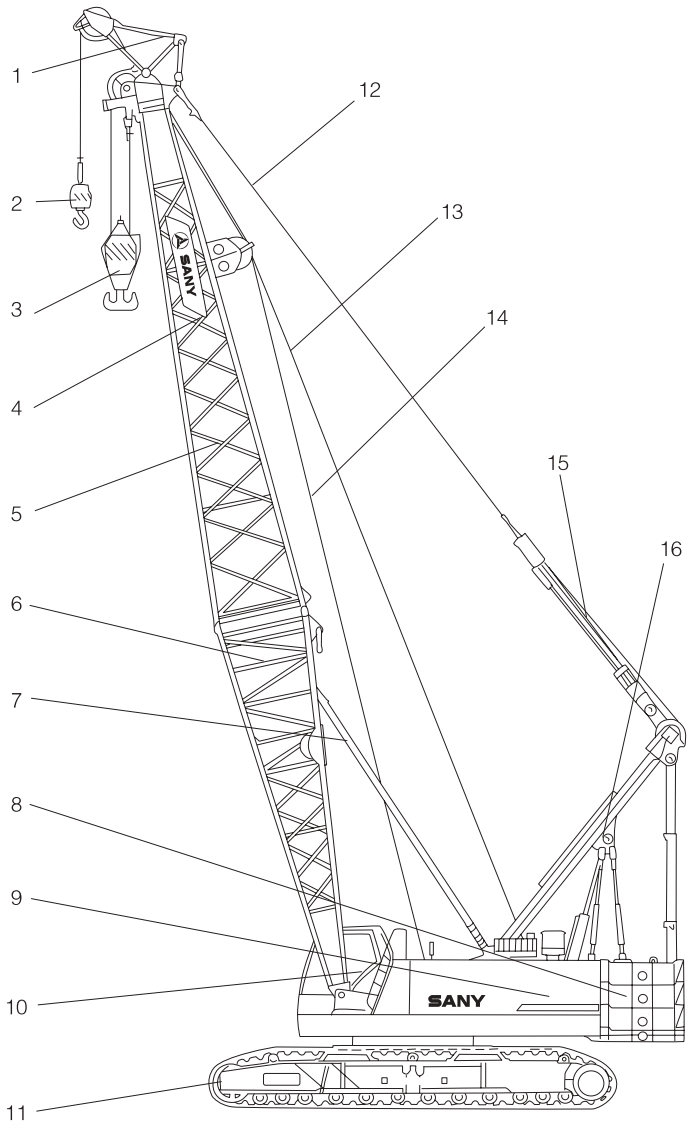
1 Performance Parameters of Overall Crane

1.1 Overview

The crane is designed and manufactured according to relative national standards, ISO standards, and occupation standards, and it is only designed for installing, loading and unloading. Any other use beyond the specification, e. g. grabbing, scrapping, power ramming and electromagnetic hoisting, is not within the operation scope. It should be noted that the operator shall follow the operation instructions within the allowable operation scope and be aware of safety all the time to avoid potential dangers. The manufacturer takes no responsibility for results caused by use out of the specification. **The operator and the crane owner will be fully responsible for consequences caused by such usages.**

1.2 Structure of the Crane

From the respect of the components contained, the crane includes: crawler traveling device, main platform, main hoisting mechanism, auxiliary hoisting mechanism, boom luffing mechanism, jib luffing mechanism, engine set, operator's cab, slewing mechanism, hydraulic system, electric system, rear counterweight, central ballast and operation device.



Structural Diagram of the Crane

No.	Name	No.	Name
1	Boom extension jib	9	Machine cover
2	Hook block for extension jib	10	Operator’s cab
3	Hook block for main boom	11	Crawler traveling mechanism
4	Boom tip	12	Boom pendant cable
5	Boom insert	13	Auxiliary hoisting wire rope
6	Boom base	14	Main hoisting wire rope
7	Boom back-stop	15	Boom luffing wire rope
8	Counterweight	16	A-frame

1.3 Technical Parameters of Overall Crane

Crane classification group: A1

1.3.1 Table of Main Performance Parameters

Table 2-1 Table of Main Performance Parameters

Technical Index	Unit	Value
Rated lifting capacity	kg (lb)	100,000(220460)
Maximum lifting moment	kg• m (lb• ft)	100,000×5.5=550,000 (220460×18'1")=3978000
Boom operating condition: boom length	m (ft)	18~72(59'1"~236'3")
Boom luffing angle	°	30°~78°
Fixed jib length	m (ft)	13~25 (42'8"~82')
Fixed jib operating condition: full extension boom + full extension fixed jib	m (ft)	60+25/63+19 (196'10"+82')/(206'8"+62'4")
Max. wire speed of main and aux. hoisting winches (outermost layer)	m/min (fpm)	0~110 (0~361)
Max. wire speed of luffing winch (outermost layer)	m/min	0~73(0~240)
Slewing speed (no load)	r/min	0~1.9
Travel speed	km/h (mph)	0~1.0 (0~0.62) (high speed)\ 0~0.68 (0~0.42) (low speed)
Gradeability (with basic boom, no load)	%	30%
Overall weight (with basic boom, 200t(220UST) hook block)	kg (lb)	115,000 (253530)
Average ground bearing pressure	MPa (psi)	0.085 (12.33)
Counterweight (standard counterweight and additional counterweight)	kg (lb)	42,000+3,000 (92590+6610)
Max. transport dimension of single unit (Length × Width × Height)	mm (ft)	16080×3400×3050 (52'9"×11'2"×10')
Max. transport weight of single unit	kg (lb)	41,000(90390)

□1.3.2A Engine (Tier 3)

Table 2-2 Technical Parameters of Engine

Manufacturer	Cummins
Type	QSL8.3(tier 3)
Rated rotational speed	2000 r/min
Rated torque	1268 N·m /1400 r/min(935lb• ft/1400rpm)
Rated power	183kW / 2000r/min(245hp/2000rpm)

□1.3.3A Hydraulic System (Kawasaki)

The SCC1000C crawler crane employs the full hydraulic drive. From the respect of the components contained, the hydraulic system consists of the following units: power unit, control unit, actuator, hydraulic oil tank and auxiliary components.

-- Hydraulic power unit is composed of:
1. Engine: Cummins diesel
2. Hydraulic pumps:
Main pump: swashplate variable dual pumps with two sets of axle piston rotary apparatuses and employing an open circuit, equipped with a built-in auxiliary pump to provide pressure and servo oil to each major actuator.
Rotary pump: front pump of dual gear pumps, installing at main pump power output provides high pressure oil to slewing motor.
Auxiliary pump: rear pump of dual gear pumps, provides high pressure oil to oil radiator motor and free fall clutch.
Servo pump: gear pump, provides high pressure oil to servo hydraulic system and auxiliary actuators.
--Main control valves of the hydraulic system include: three multi-way valves, three pilot control valves, and auxiliary motion control valves.
-- Actuators include motor of main hoisting winch, motor of auxiliary hoisting winch, motor of luffing winch, left and right traveling motors, slewing motor, rachet and pawl cylinders, A-frame cylinders, slewing locking cylinders, outrigger cylinders and hydraulic brakes.
-- Hydraulic oil tank: It is equipped with components such as oil suction port, return oil filter, air filter, and sight glass. The tank is located behind the right platform and functions storing and filtering hydraulic oil and radiating heat. The hydraulic oil tank must be serviced according to the signs on the tank body on time.

-- The auxiliary hydraulic components include:
1. Oil filter: The servo oil circuit, slewing oil circuit, and hydraulic oil tank are all equipped with oil filters, so as to remove the particle pollutant in the hydraulic oil, to protect the hydraulic components, and to prolong the service life of the components. The filter core of oil filter must be serviced according to the request.
2. Hydraulic swivel joint: It is located at the center of the slewing ring and functions as a flow channel for receiving the high pressure oil from upperworks oil circuit to the lowerworks oil circuit.
3. Hydraulic oil radiator: When the oil temperature of the hydraulic oil system is high, the radiator starts to act to decrease the system temperature.
4. Accumulator: The servo system is equipped with an accumulator to maintain the pressure of servo system steadily.

In the meantime, the hydraulic system can also be divided into three major parts due to the circuits: the main circuit system, the auxiliary circuit system, and the servo circuit system.
The main circuit system includes the main hoisting oil circuit, the auxiliary hoisting oil circuit, the luffing oil circuit, left and right travel oil circuits, and the slewing oil circuit.
The auxiliary circuit system is composed of auxiliary cylinder circuits and heat radiating circuits.
The servo circuit system: include the foot pilot controlling and hand pilot controlling and pilot controlling of each control and actuator, to control each main & auxiliary oil circuit components, regulate each actuator motion and implement remote centralized control.

-- Main parameters of hydraulic system

Table 2-3 Parameters of Pump Set

No.	Pump	Rated Operating Pressure(bar)(psi)	Rated Displacement (ml/r)(oz/r)	Remark
1	Main pump	294 (4267)	105×2 (3.55×2)	
2	Rotary pump	314 (4557)	45 (1.52)	
3	Gear pump	39/200 (566/2903)	10/12 (0.34/0.41)	

⚠ CAUTION

All pressures and zero positions of hydraulic pumps, motors and valves have been adjusted before out of the factory. Non-professionals are not allowed to adjust their positions. Professionals are allowed to carry out the adjustment only after being trained by this company.

1.3.4 Electric System

The overall crane voltage is DC24V, supplied by 2 batteries connected in series. The cold-start current of single battery is 850CCA, reserve capacity is 230Ah. The batteries are mainly used to start the engine, supply power for the electric control cables and lighting equipment. The generator produces electricity to charge the battery and supply power for electrical equipment. The overall crane adopts single wire system. The power is in mode of minus earth (details refer to circuit diagram).
Electric system is composed with startup system, assistant controlling system, actuators, safety system, alarming system and assisting system, listed as follows:

-- Startup system: consisting of ignition lock, batteries, startup motor, engine and generator. Ignition lock functions to connect batteries to power startup motor, which turns to start the engine. Then the started engine drives the generator to power the whole crane and charge the battery.
-- Assistant controlling system: consisting of left and right control panels and remote control box. The control panels are equipped with working mode switch, accelerator controlling switch, speed adjusting switch, swing lock/unlock switch, main/auxiliary winch lock/unlock switch, and main luffing lock/unlock switch for various operating purposes. Remote control box mainly functions to control the upperworks and lowerworks assembly.
-- Actuators: consisting of solenoid valves for connecting/cutting off hydraulic oil circuits.
-- Safety System: consisting of load moment limiter, proximity switches, travel switches, pulling switches, 3-wraps protection switch, oil temperature sensor, and gradienter. Load moment limiter is used to avoid dangerous operations, ensuring the whole crane in safe state. The other limit switches function to protect the actuators away from damage during operation.
-- Alarming system: working as the controller raising audio-visual alarming signals after analyzing information of current working state and signals detected by the safety system, which reminds the operating personnel taking measures and the surrounding personnel of safety. The alarming information can be indicated by the tri-color alarming lights, horn, turning light at the rear of the platform, as well as buzzer, alarming light, displays and load moment limiter in the cab.
-- Assisting system: consisting of lightning protection device, video monitoring system, and cab attachment devices.

Table 2-4 Parameters of Batteries

Crane Type	Cold-start current	Capacity	Connection mode
SCC1000C	850CCA	230AH	2 in series

1.3.5 Hoisting mechanism

Table 2-5 Main Parameters of Hoisting Mechanism

Main hoisting winch W1	Type of wire rope	Non-rotating wire rope
	Diameter of wire rope	24mm (15/16")
	Length of wire rope	290m (951'5")
	Rated single line pull	0~110m/min(0~361fpm)
	Single line speed (outermost layer)	88.2kN(19828lb)
	Breaking force	520kN(116900lb)
Auxiliary hoisting winch W2	Type of wire rope	Non-rotating wire rope
	Diameter of wire rope:	24mm (15/16")
	Length of wire rope	210m (688'12")
	Rated single line pull	0~110m/min(0~361fpm)
	Single line speed (outermost layer)	88.2kN(19828lb)
	Breaking force	520kN(116900lb)
Main luffing winch W3	Type of wire rope	Rotating wire rope
	Diameter of wire rope	20mm (13/16")
	Length of wire rope	240m (787'5")
	Rated single line pull	68.6kN(15422lb)
	Breaking force	346kN(77784lb)

1.3.6 Operation Devices and Hook Blocks

Note: The equipments in this section are the complete configurations. Actual configuration see the purchase contract.

1.3.6.1 Overview

-- Main boom length: (18m~72m)(59'1"~236'3")
-- Main boom + fixed jib: (39m~63m)+(13m~25m) (127'11"~206'8")+ (42'8"~82')
-- Main boom + extension jib: (18m~69m)+1.34m(59'1"~226'5")+(4'5")

1.3.6.2 Hook Blocks

Table 2-6 Parameters of Hook Blocks

Nominal Load (t)(UST)	100(110)	50(55)	25(27.5)	9(10)
Dead-weight (kg)(lb)	1600(3527)	900(1984)	550(1213)	250(552)

1.3.6.3 Rope Falls of Hook Blocks

Table 2-7 Rope Falls

Hook block	**Maximum rated load (kg(lb)×1000)**										
Nominal load 100t	14 rope falls	12 rope falls	10 rope falls	8 rope falls	7 rope falls	6rope falls	5 rope falls	4 rope falls	3 rope falls	2 rope falls	1 rope falls
(110UST) 50t	100 (220)	92 (202)	82 (180)	72 (158)	62 (136)	52 (114)					
(55UST) 25t						50 (110)	45 (99)	35 (77)	25 (55)		
(27.5UST) 9t									25 (55)	18 (39)	9.0 (19)
(10UST)											9.0 (19)

1.3.6.4 Pendant Cable

Table 2-8 Pendant cable

Boom pendant cable					
Code	I	II	III	IV	V
Length (m)(ft)	2.8(9'2")	5.8(19')	8.8(28'10")	10.4(34'1")	28.26(92'9")

Fixed jib pendant cable				
Code	A	B	C	D
Length (m)(ft)	22.67(74'5")	2.225(7'4")	28.07(92'1")	11.24(36'11")

1.3.6.5 Combinations of Booms

Table 2-9 Boom Combinations

Main boom						
Boom Number	Boom base 1	3m(9'10") insert	6m(19'8") insert	9m(29'6")A insert	9m(29'6")B insert	Boom tip 1
		2	2	3	1	

Fixed jib			
Fixed jib	Jib base	6m(19'8") insert	Jib tip
Number	1	2	1

1.3.6.6 Codes of Operating Conditions

Table 2-10 Code of Operating Conditions

No.	Operating condition	Code of operating condition
1	Main boom	H
2	Fixed jib	FJ
3	Main boom + Extension jib	HC

1.3.6.7 Operating Conditions

1. H operating condition

As shown in Fig. T103 1003, range of main boom length is 18 m~72m(59'1"~236'3") .

--Combination method:

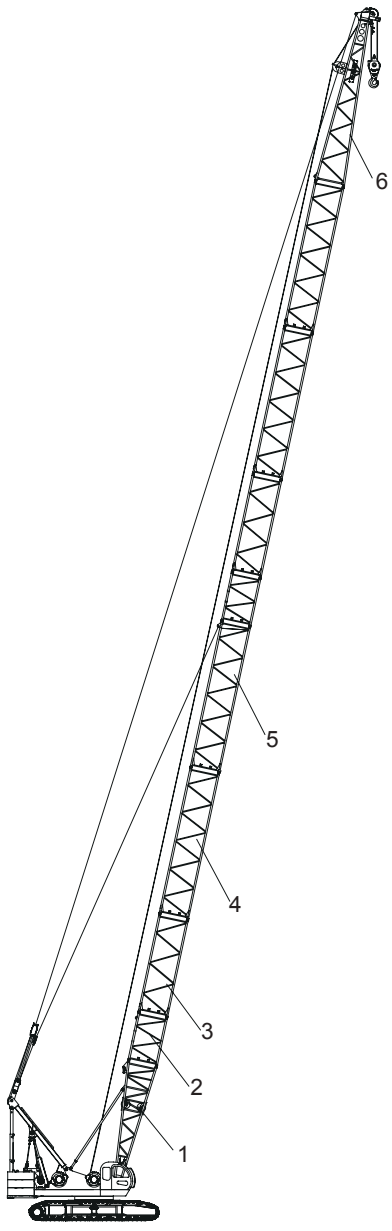
• The 18m(59'1") basic boom combined by boom tip plus boom base is the shortest main boom combination. Boom inserts of 3m (9'10"), 6m(19'8"), and 9m(29'6") is available, length of main boom varies from basic boom 18m(59'1") to full extension boom 72m(236'3").

• See Table 2-11 Boom Combinations in H Operating Condition for combining booms of other lengths.

No.	Name
1	Boom base: 7.5m(24'7")×1
2	Boom insert: 3m(9'10")×2
3	Boom insert: 6m(19'8")×2
4	Boom insert:9m(29'6")A×3
5	Boom insert:9m(29'6")B×1
6	Boom tip: 10.5m(34'5")×1

⚠ CAUTION

100t(110UST), 50t(55UST), and 25t(27.5UST), 9t(10UST) hook blocks and other optional hook blocks can be selected as needed.



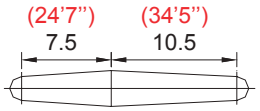
H operating condition

T103 1003

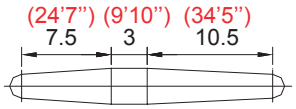
--Boom combinations in H operating condition

Table 2-11 Boom Combination in H Operating Condition

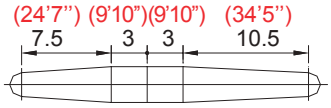
(59'1")
18m Boom



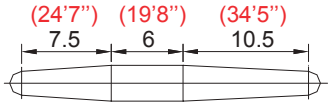
(68'11")
21m Boom



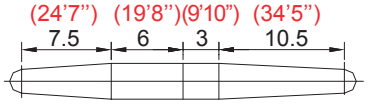
(78'9")
24m Boom



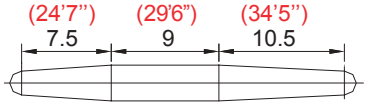
(78'9")
*24m Boom



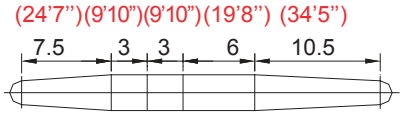
(88'7")
27m Boom



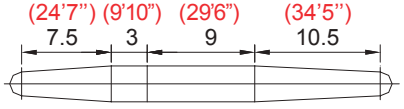
(88'7")
*27m Boom



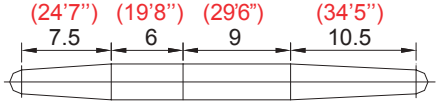
(98'5")
30m Boom



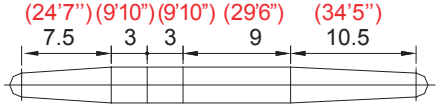
(98'5")
*30m Boom



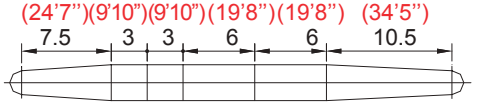
(108'3")
*33m Boom



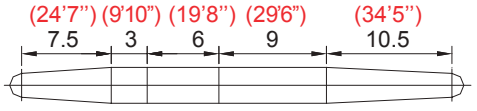
(108'3")
33m Boom



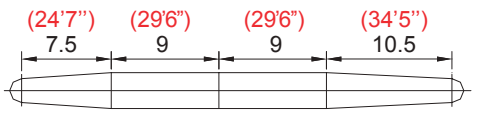
(118'1")
36m Boom



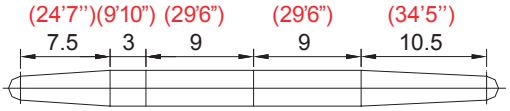
(118'1")
36m Boom



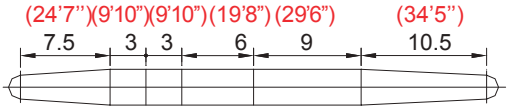
(118'1")
*36m Boom



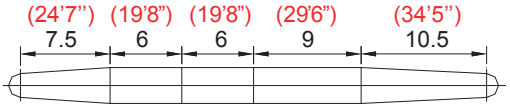
(127'11")
*39m Boom



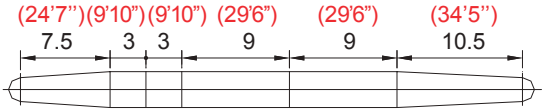
(127'11")
39m Boom



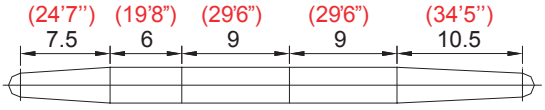
(127'11")
39m Boom



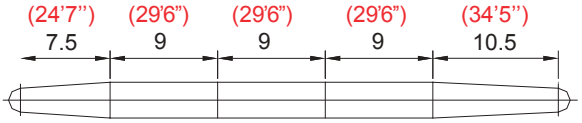
(137'10")
42m Boom



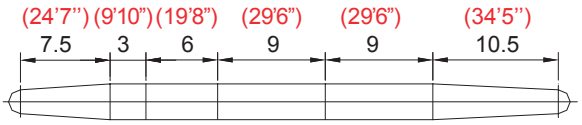
(137'10")
*42m Boom



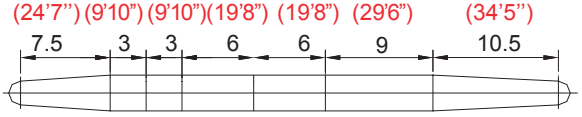
(147'8")
*45m Boom



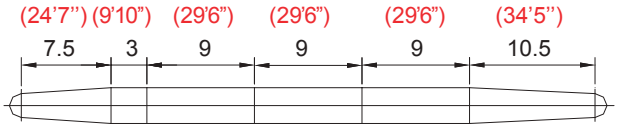
(147'8")
45m Boom



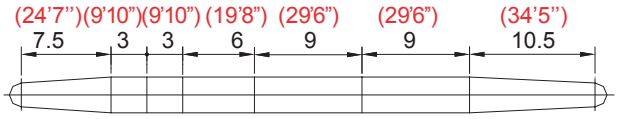
(147'8")
45m Boom



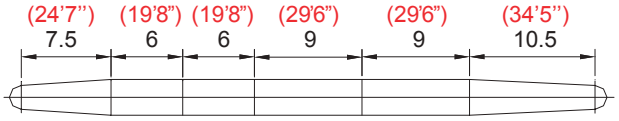
(157'6")
*48m Boom



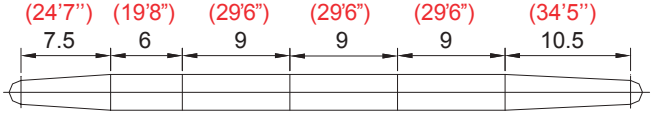
(157'6")
48m Boom

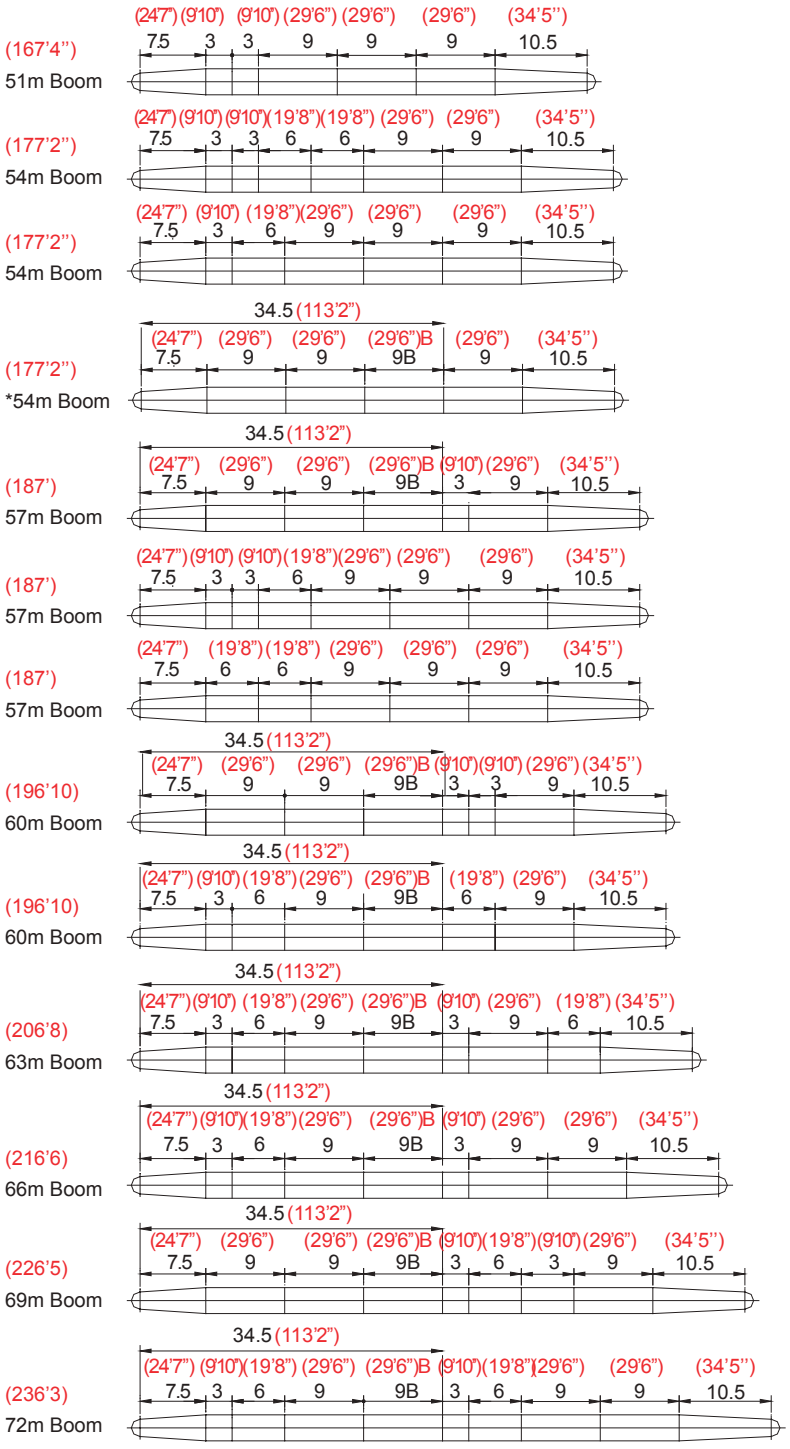


(157'6")
48m Boom



(167'4")
*51m Boom





⚠ CAUTION

The combination with * is the prior option in H operating condition.

Table 2-12 Combination of Boom and Pendant Cable in H Operating Condition

Boom length (m)	Boom combination	Combination of pendant cable	Length of pendant cable
18 (59'1")	7.5+10.5 (24'7"+34'5")	Ⅳ	10.6 (34'9") (include connecter)
21 (68'11")	7.5+3+10.5 (24'7"+9'10"+34'5")	Ⅳ+Ⅰ	13.6 (44'7") (include connecter)
24 (78'9")	7.5+3+3+10.5 (24'7"+9'10"+9'10"+34'5")	Ⅳ+Ⅰ+Ⅰ	16.6 (54'6") (include connecter)
24★ (78'9")	7.5+6+10.5 (24'7"+19'8"+34'5")	Ⅳ+Ⅱ	16.6 (54'6") (include connecter)
27 (88'7")	7.5+3+6+10.5 (24'7"+9'10"+19'8"+34'5")	Ⅳ+Ⅱ+Ⅰ	19.6 (64'4") (include connecter)
27★ (88'7")	7.5+9A+10.5 (24'7"+29'6"A+34'5")	Ⅳ+Ⅲ	19.6 (64'4") (include connecter)
30 (98'5")	7.5+3+3+6+10.5 (24'7"+9'10"+9'10"+19'8"+34'5")	Ⅳ+Ⅱ+Ⅰ+Ⅰ	22.6 (74'2") (include connecter)
30★ (98'5")	7.5+3+9A+10.5 (24'7"+9'10"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅰ	22.6 (74'2") (include connecter)
33 (108'3")	7.5+3+3+9A+10.5 (24'7"+9'10"+9'10"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅰ+Ⅰ	25.6 (83'12") (include connecter)
33★ (108'3")	7.5+6+9A+10.5 (24'7"+19'8"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅱ	25.6 (83'12") (include connecter)
36 (118'1")	7.5+3+6+9A+10.5 (24'7"+9'10"+19'8"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅱ+Ⅰ	28.6 (93'10") (include connecter)
36 (118'1")	7.5+3+3+6+6+10.5 (24'7"+9'10"+9'10"+19'8"+19'8"+34'5")	Ⅳ+Ⅱ+Ⅱ+Ⅰ+Ⅰ	28.6 (93'10") (include connecter)
36★ (118'1")	7.5+9A+9A+10.5 (24'7"+29'6"A+29'6"A +34'5")	Ⅳ+Ⅲ+Ⅲ	28.6 (93'10") (include connecter)
39 (127'11")	7.5+3+3+6+9A+10.5 (24'7"+9'10"+9'10"+19'8"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅱ+Ⅰ+Ⅰ	31.6 (103'8") (include connecter)
39 (127'11")	7.5+6+6+9A+10.5 (24'7"+19'8"+19'8"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅱ+Ⅱ	31.6 (103'8") (include connecter)
39★ (127'11")	7.5+3+9A+9A+10.5 (24'7"+9'10"+29'6"A +29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅰ	31.6 (103'8") (include connecter)

Boom length (m)	Boom combination	Combination of pendant cable	Length of pendant cable 34.6
42 (137'10")	7.5+3+3+9A+9A+10.5 (24'7"+9'10"+9'10"+29'6"A +29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+ Ⅰ + Ⅰ	(113'6") (include connecter) 34.6
42★ (137'10")	7.5+6+9A+9A+10.5 (24'7"+19'8"+29'6"A+29'6"A+34'5") 7.5+3+3+6+6+9A+10.5	Ⅳ+Ⅲ+Ⅲ+ Ⅱ	(113'6") (include connecter) 37.6
45 (147'8")	(24'7"+9'10"+9'10"+19'8"+19'8"+29' 6"A+34'5") 7.5+3+6+9A+9A+10.5	Ⅳ+Ⅲ+ Ⅱ + Ⅱ + Ⅰ + Ⅰ	(123'4") (include connecter) 37.6
45 (147'8")	(24'7"+9'10"+19'8"+29'6"A +29'6"A+34'5") 7.5+9A+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+ Ⅱ + Ⅰ	(123'4") (include connecter) 37.6
45★ (147'8")	(24'7"+29'6"A+29'6"A +29'6"A+34'5") 7.5+3+3+6+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+Ⅲ	(123'4") (include connecter) 40.6
48 (157'6")	(24'7"+9'10"+9'10"+19'8"+29'6"A +29'6"A+34'5") 7.5+6+6+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+ Ⅱ + Ⅰ + Ⅰ	(133'2") (include connecter) 40.6
48 (157'6")	(24'7"+19'8"+19'8"+29'6"A +29'6"A+34'5") 7.5+3+9A+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+ Ⅱ + Ⅱ	(133'2") (include connecter) 40.6
48★ (157'6")	(24'7"+9'10"+29'6"A+29'6"A +29'6"A+34'5") 7.5+3+3+9A+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+Ⅲ+ Ⅰ	(133'2") (include connecter) 43.6
51 (167'4")	(24'7"+9'10"+9'10"+29'6"A+29'6"A +29'6"A+34'5") 7.5+6+9A+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+Ⅲ+ Ⅰ + Ⅰ	(143'1") (include connecter) 43.6
51★ (167'4")	(24'7"+19'8"+29'6"A+29'6"A+29'6"A +34'5") 7.5+3+3+6+6+9A+9A+10.5	Ⅳ+Ⅲ+Ⅲ+Ⅲ+ Ⅱ	(143'1") (include connecter) 46.6
54 (177'2")	(24'7"+9'10"+9'10"+19'8"+19'8"+29' 6"A+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+ Ⅱ + Ⅱ + Ⅰ + Ⅰ	(152'11") (include connecter)

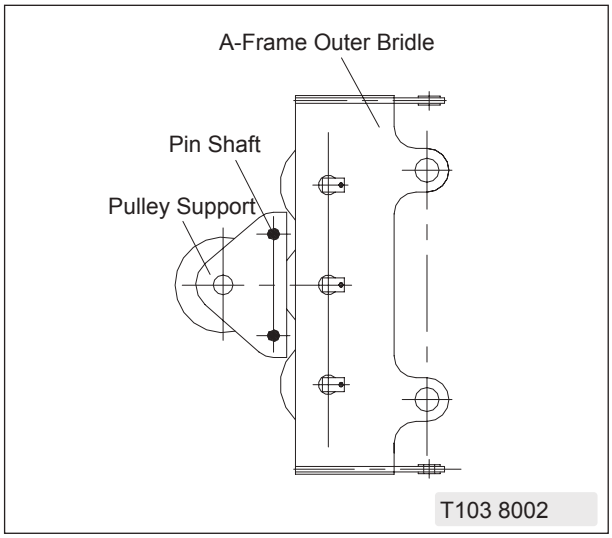
Boom length (m)	Boom combination	Combination of pendant cable	Length of pendant cable
54 (177'2")	7.5+3+6+9A+9A+9A+10.5 (24'7"+9'10"+19'8"+29'6"A+29'6"A+ 29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅲ+Ⅱ+Ⅰ	34.6 (113'6") (include connecter)
54★ (177'2")	7.5+9A+9A+9B+9A+10.5 (24'7"+29'6"A+29'6"A+29'6"B +29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅲ+Ⅲ	34.6 (113'6") (include connecter)
57 (177'2")	7.5+3+3+6+9A+9A+9A+10.5 (24'7"+9'10"+9'10"+19'8"+29'6"A+29 '6"A+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅲ+Ⅱ+Ⅰ+Ⅰ	37.6 (123'4") (include connecter)
57 (177'2")	7.5+6+6+9A+9A+9A+10.5 (24'7"+9'10"+9'10"+19'8"+29'6"A+29 '6"A+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅲ+Ⅱ+Ⅱ	37.6 (123'4") (include connecter)
57★ (177'2")	7.5+9A+9A+9B+3+9A+10.5 (24'7"+29'6"A+29'6"A+29'6"B+9'10" +29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅲ+Ⅲ+Ⅰ	37.6 (123'4") (include connecter)
60 (196'10")	7.5+3+6+9A+9B+6+9A+10.5 (24'7"+9'10"+19'8"+29'6"A+29'6"B+ 19'8"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅱ+Ⅲ+Ⅲ+Ⅱ+Ⅰ+Ⅴ	40.6 (133'2") (include connecter)
60 (196'10")	7.5+9A+9A+9B+3+3+9A+10.5 (24'7"+29'6"A+29'6"A+29'6"B+9'10" +9'10"+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅰ+Ⅰ+Ⅲ+Ⅲ+Ⅲ+Ⅴ	40.6 (133'2") (include connecter)
63 (206'8")	7.5+3+6+9A+9B+3+9A+6+10.5 (24'7"+9'10"+19'8"+29'6"A+29'6"B+ 9'10"+29'6"A+19'8"+34'5")	Ⅳ+Ⅱ+Ⅲch+Ⅰ+Ⅲ+Ⅲ+Ⅱ+Ⅰ+Ⅴ	40.6 (133'2") (include connecter)
66 (216'6")	7.5+3+6+9A+9B+3+9A+9A+10.5 (24'7"+9'10"+19'8"+29'6"A+29'6"B+9' 10"+29'6"A+29'6"A+34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅰ+Ⅲ+Ⅲ+Ⅱ+Ⅰ+Ⅴ	43.6 (143'1") (include connecter)
69 (226'5")	7.5+9A+9A+9B+3+6+6+9A+10.5 (24'7"+29'6"A+29'6"A+29'6"B+9'10"+ 19'8"+19'8"+29'6"A +34'5")	Ⅳ+Ⅲ+Ⅱ+Ⅱ+Ⅰ+Ⅲ+Ⅲ+Ⅲ+Ⅴ	43.6 (143'1") (include connecter)
72 (236'3")	7.5+3+6+9A+9B+3+6+9A+9A+10.5 (24'7"+9'10"+19'8"+29'6"A+29'6"B+9' 10"+19'8"+29'6"A +29'6"A +34'5")	Ⅳ+Ⅲ+Ⅲ+Ⅱ+Ⅰ+Ⅲ+Ⅲ+Ⅱ+Ⅰ+Ⅴ	46.6 (152'11") (include connecter)

⚠ CAUTION

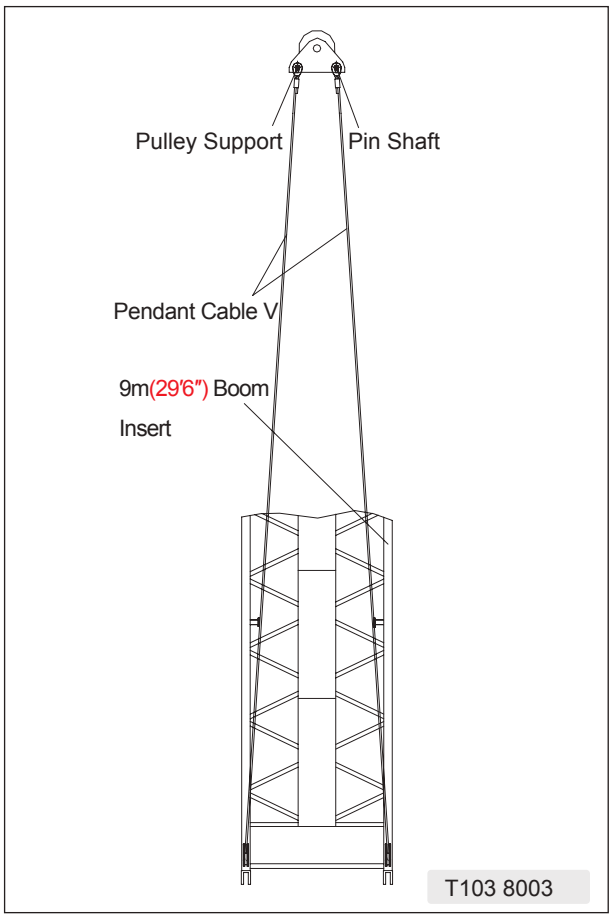
-- The combination with★is the prior option in Table 2-12 to other combinations of the same length.
-- Codes Ⅰ / Ⅱ /Ⅲ/Ⅳ/ Ⅴ of Corresponding pendant cable combination in the table as shown in Table 2-8 Pendant cable.
--The 9m(29′6″)B boom insert should be installed at 25.5m(83′6″), and the pendant cable Ⅴ should be employed to connected the top connecting plate of 9m(29′6″)B insert and outer bridle frame, when the boom length ≥60m(196′10″).

Installation approach:

see Fig. T103 8002, remove the pulley support of A-frame outer bridle, and then connected the pendant cable Ⅴ as shown in Fig.T103 8003.



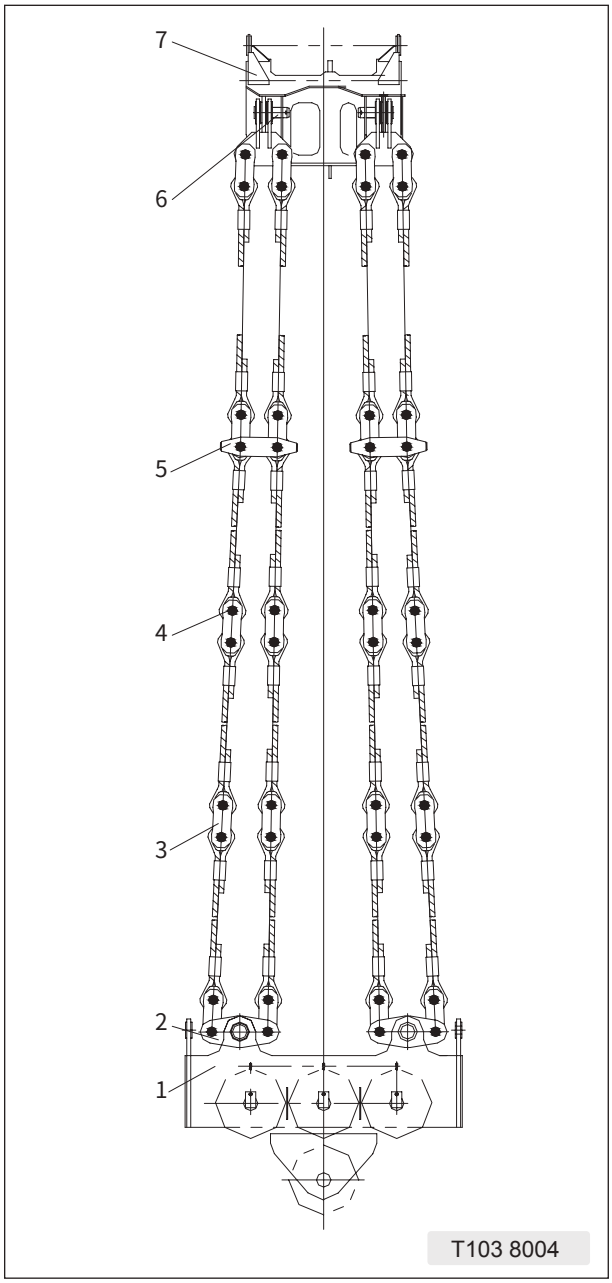
T103 8002



T103 8003

-- Pendant cable connection

No.	Name
1	A-frame outer bridle
2	Connecting plate
3	connecter
4	Pin shaft
5	Spreader
6	Pin shaft
7	Top of boom tip



Boom Pendant Cable Connection

2. FJ operating condition

As shown in Fig. T103 1004

• Main boom (39m~63m) (127'11"~206'8"), including:

Boom base: 7.5m(24'7")×1

Boom insert: 3m(9'10")×2

Boom insert: 6m(19'8")×2

Boom insert: 9m(29'6")A×2

Boom insert: 9m(29'6")B×2

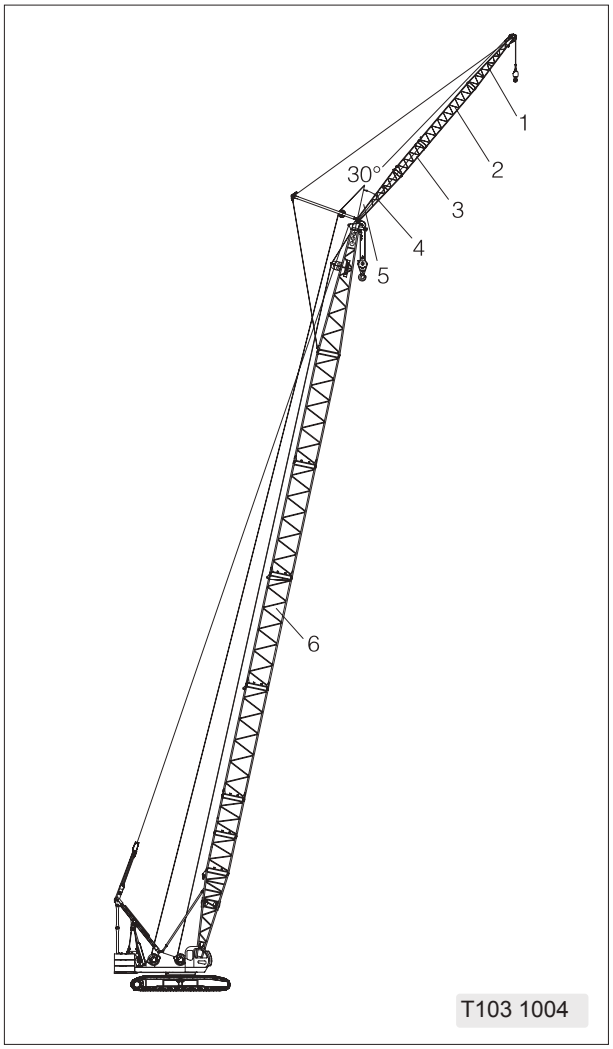
Boom tip:10.5m(34'5")×1

-- Combination method:

First select boom inserts to combine into a section of 21m~45m(68'11"~147'8"), and then connect it to the boom base and boom tip.

⚠ CAUTION

If installed with jib, the length of main boom shall not be less than 39m (127′11″) and no more than 63m (206′8″), and the 63m(206′8″) main boom is not allow to be installed with 25m(82′) fixed jib.



T103 1004

No.	Name
1	Jib tip: 5m(16'5")×1
2	Jib insert:6m(19'8")×2
3	Jib insert:3m(9'10")×1
4	Jib base:5m(16'5")×1
5	Jib offset angle:(15°, 30°)
6	Main boom:39m~63m (127'11"~206'8")

• **Fixed jib**

(13m~25m)(42'8"~82'), including:

Jib base: 5m(16'5")×1

Jib tip:5m(16'5")×1

Jib insert: 3m(9'10")×1

Jib insert: 6m(19'8")×2

-- Combination method:

a. Connect jib base, jib tip and 3m(9'10") jib insert to combine into a section of 13m(42'8").

b. See Table 2-12 Boom Combinations in FJ Operating Condition for combining booms of other lengths.

-- FJ operating condition

Table 2-13 Boom Combinations in FJ Operating Condition

Jib length (m)(ft)	Jib insert		Main boom length (m)(ft)	Jib offset angle
	3m(9'10") insert	6m(19'8") insert		
13m(42'8")	1	-	39~63 (127'11"~206'8")	15°, 30°
19m(62'4")	1	1	39~63 (127'11"~206'8")	15°, 30°
25m(82')	1	2	39~60 (127'11"~196'10")	15°, 30°

Table 2-14 Combination of Pendant Cable in FJ Operating Condition

Combination of pendant cable in FJ operating condition			
Jib offset angle / Length of fixed jib	Pendant cable (along the fixed jib)	Pendant cable (along the main boom)	
	15°and30°	15°	30°
13m(42'8")	C	A	A+B
19m(62'4")	C+D	A	A+B
25m(82')	C+2D	A	A+B

⚠ CAUTION

Codes A/B/C/D in the table indicate jib pendant cable along the fixed jib, as shown in Table 2-8 Pendant Cable.

3. HC operating condition combination

Boom length in HC operating condition (18m~69m) (59'1"~226'5"), as shown in Fig. T103 1005.

-- Combination method:

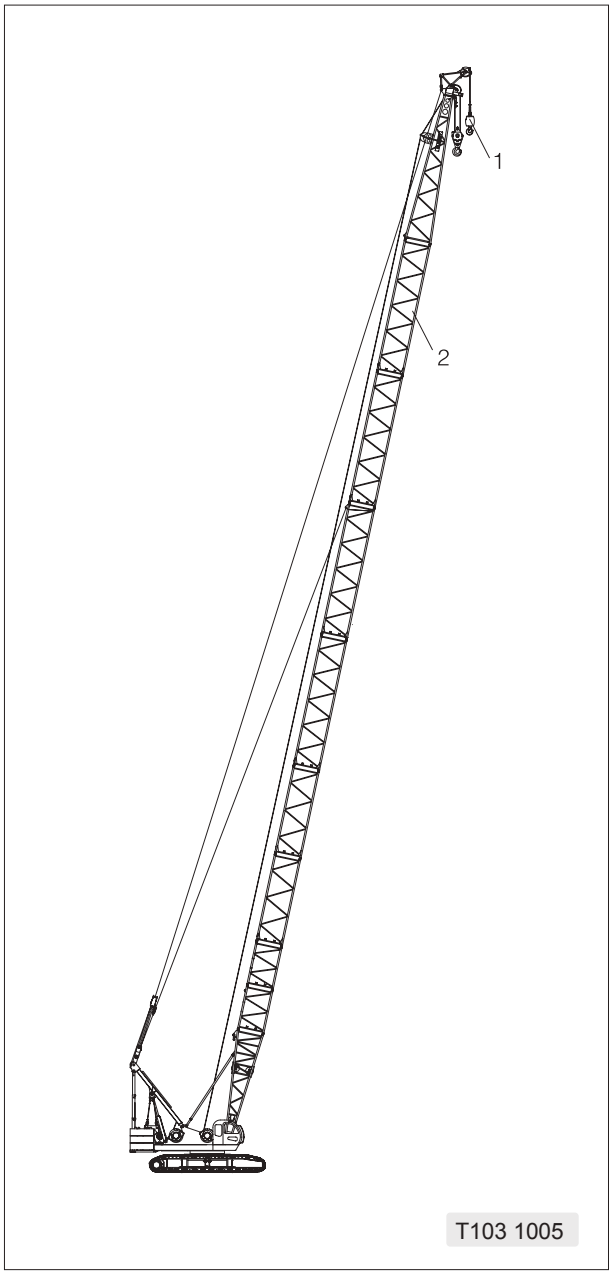
• The boom combined by boom tip and boom base plus the extension jib to make the shortest combination in HC operating condition; Boom inserts of 3m(9'10"), 6m (19'8"), and 9m(29'6") is available, length of main boom varies from basic boom 18m (59'1") to full extension boom 69m(226'5"). The combination of main boom is the same as that in H operating condition, when there are more choices for combination of the same length, please select the prior option.

• See Table 2-11 Boom Combinations in H Operating Condition for combining booms of other lengths.

⚠ CAUTION

-- The extension jib shall be installed the 9t(10UST) hook block.

-- If installed with extension jib, the length of main boom shall not be more than 69m(226′5″).



HC Operating Condition

No.	Name
1	Extension jib
2	Main boom

1.4 Counterweight

Table 2-15 Parameters of Counterweight

Dimensions of Counterweight Blocks					
Name	**Quantity**	Length (m)(ft)	Width (m)(ft)	Height (m)(ft)	Unit weight (kg)(lb)
Counterweight tray	1	4.2(13'9")	1.6(5'3")	0.49(1'7")	6600(14550)
Counterweight block	6	1.6(5'3")	1.2(3'11")	0.57(1'10")	6000(13230)
Additional block	1	0.93(3'1")	0.72(2'4")	1(3'3")	3000(6610)

Additional Counterweight Using Condition			
Operating Condition	**Load Chart**	Boom Length Range (with Additional Counterweight)	**Remark**
H	Main Boom Load Chart	39m≤Main Boom Length≤72m (127'11"≤Main Boom Length≤236'3")	
HC	Main Boom Load Chart	39m≤Main Boom Length≤69m (127'11"≤Main Boom Length≤226'5")	
	Extension Jib Load Chart (Main Boom+ Extension Jib)	39m≤Main Boom Length≤69m (127'11"≤Main Boom Length≤226'5")	
FJ	Main Boom Load Chart	39m≤Main Boom Length≤63m (127'11"≤Main Boom Length≤206'8")	
	Fixed Jib Load Chart	39m≤Main Boom Length≤63m (127'11"≤Main Boom Length≤206'8")	

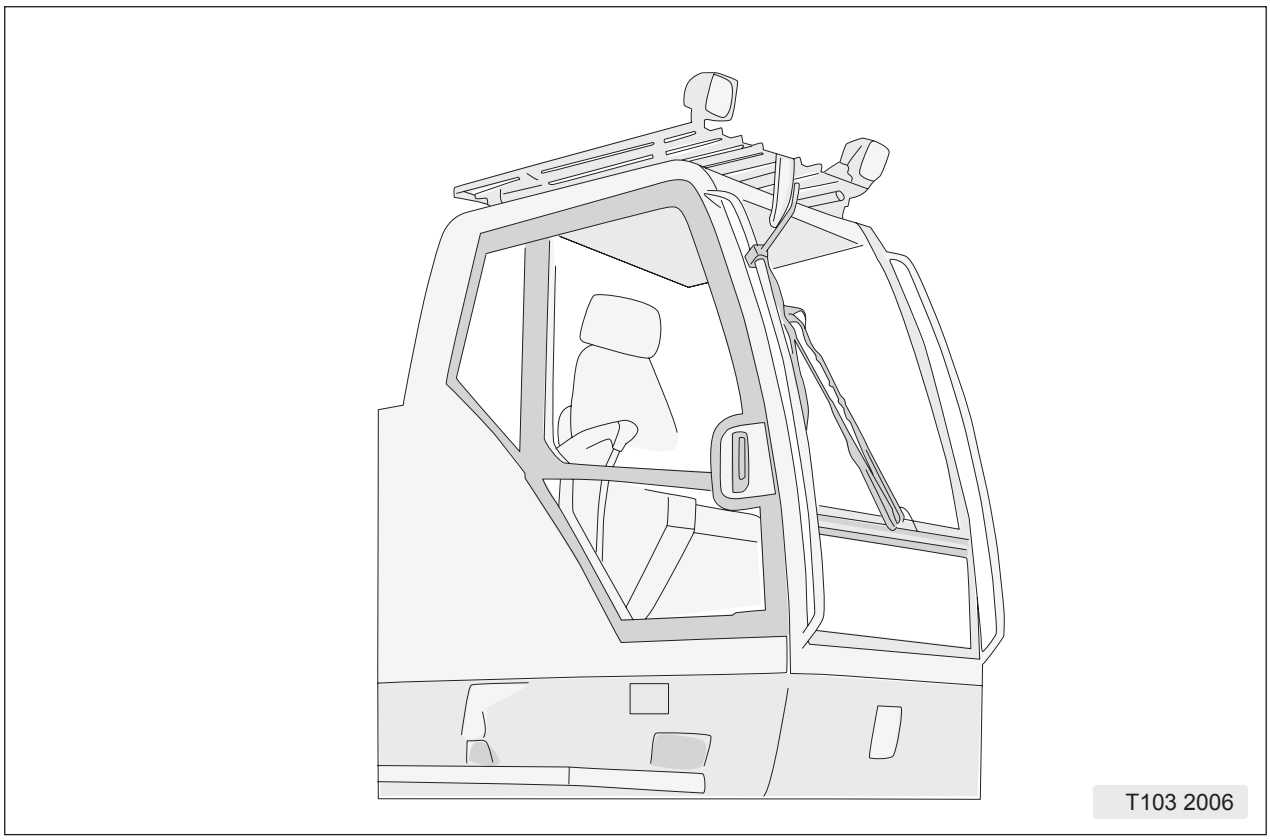
2 Operator's Cab

2.1 Overview

The operator's cab is a fully-enclosed steel frame structure with simple and pleasing shape.

Characters of the cab:

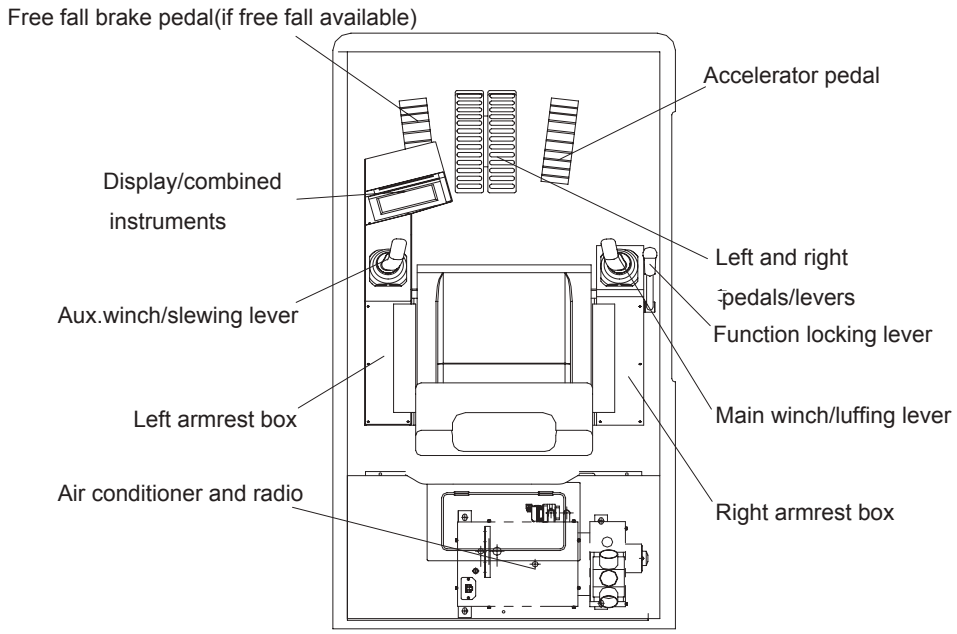
-- The sliding door is of novel design and easy closing/opening;
-- Large window of toughed glass permits good transparency;
-- A protective shield is installed on the top to ensure safety;
-- Full-float installation and sealed window/door can absorb shock and noise effectively;
-- Large indoor space;
-- Layout of control levers, switches and displays is ergonomic and convenient for operation.



Outside View of the Operator's Cab

⚠ CAUTION

The windshield wiper is prohibited to dry wipe without spraying water, as the huge resistance during dry scrap may cause the wiper motor burnout.



Plane View of the Operator's Cab

⚠ CAUTION

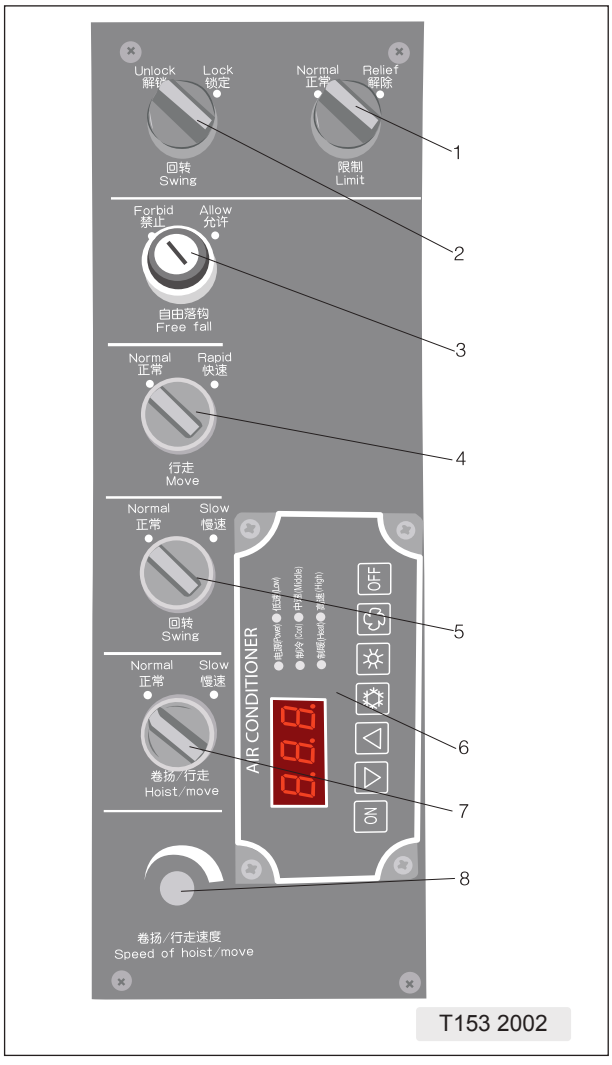
It is forbidden for any people to stay on cab roof.

2.2 Control system

NOTICE

To ensure the commonality of the product series, the universal control panel is used on each SCC crawler crane. However, not all the functions of the switches on the control panels are available for each specific crane, please choose the corresponding functions according to the actual configuration of the crane.

2.2.1 Left Control Panel



Left Control Panel

Functions of switches on the left control panel:

1. Limit

When this rotary switch is set at “Normal” position, all the limit switches can function normally.
Vice versa, when this rotary switch is set at the “Relief” position, all the limit switches fail to function.

2. Swing

When this rotary switch is set at the “Unlock” position, the swing locking pins retract and the slewing operation is unlocked.
Vice versa, when this rotary switch is set at the “Lock” position, the swing locking pins extend and the slewing operation is locked.

3.Free fall

When this rotary switch is set at the “Forbid” position, the operation of free fall is forbidden.
Vice versa, when this rotary switch is set at the “allow” position, the operation of free fall is allowable.

⚠ CAUTION

The free fall rotary switch is installed only when the free fall function is available for your crane. Otherwise, this switch is not installed.

4. Move

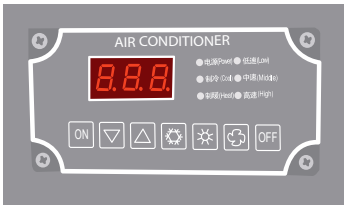
When this rotary switch is set at the “Rapid” position, the traveling speed is not more than 1.0 km/h(0.62mph); when this rotary switch is set at the “Normal” position, the traveling speed is not more than 0.68 km/h(0.42mph).

5. Swing

When this rotary switch is set at the “Slow” position, the slewing speed is not more than 0.9r/min; when this rotary switch is set at the “Normal” position, the slewing speed is not more than 1.9r/min.

6. Air conditioner

see《Section 2 Appendix --F: Use, Maintenance and Keeping of Air Conditioner》 for detail of air conditioner.



7. Hoist/Move

When this rotary switch is set at the “Slow” position, the output power of the main pump is reduced, and the crane hoists or moves at low speed. When this rotary switch is set at the “Normal” position, the output power of the main pump is normal, and the crane hoists or moves at normal speed.

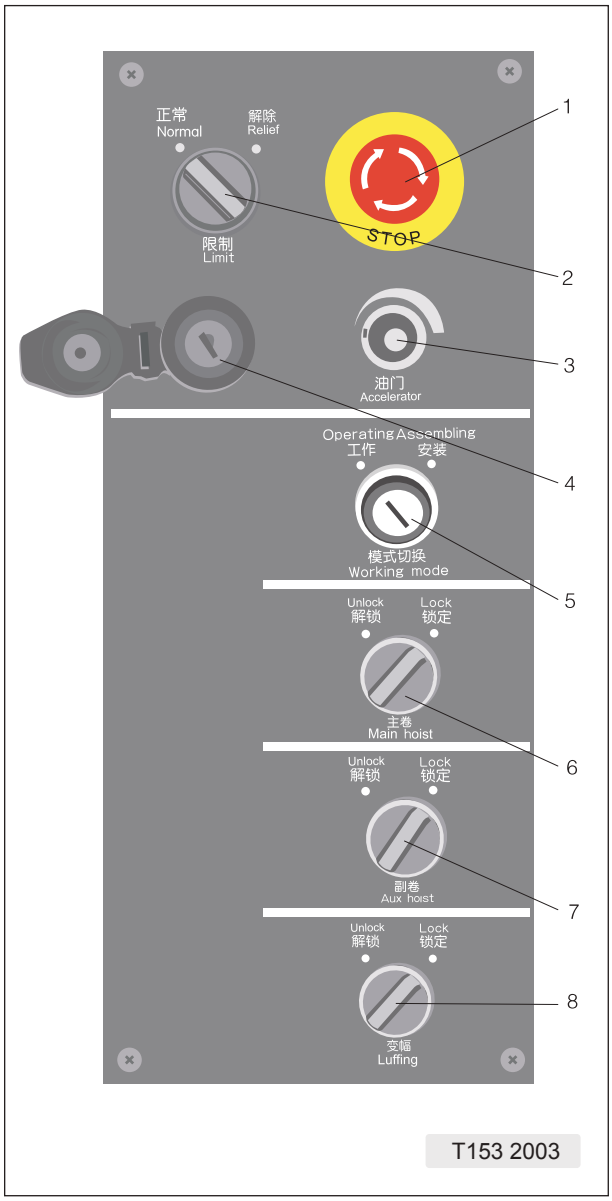
⚠ CAUTION

This function is exclusive to the Rexroth hydraulic system.

8. Speed of hoist/Move

The Speed of hoist/Move switch is installed to ensure the commonality of the control panel, not available for the SCC1000C crane.

2.2.2 Right Control Panel



Right Control Panel

Functions of switches on the right control panel:

1. Emergency stop

In case of emergency, press this button, the crane stops working and all the brakes are engaged. After the emergency is relieved, press this button again and the emergency responding system is reset.

⚠ WARNING

Pressing this button when the equipment is running at high speed or a load is lowering down quickly may cause equipment damage or even personal injury and death.

2. Limit

When this rotary switch is set at “Normal” position, all the limit switches can function normally.
Vice versa, when this rotary switch is set at the “Relief” position, all the limit switches fail to function.

Notes: 1. Both the left and right control panels are installed with such a switch, and the two switches are of exactly the same function.
2. The two switches are working parallel, i.e. if either of the two is at the relief status, all the limit switches are out of commission.

3. Accelerator

This rotary switch can regulate the power of the engine.
When it is turned clockwise, the engine power is increased, and the operation is speed up.
When it is turned counterclockwise, the engine power is decreased, and the operation is slowed down.

4. Ignition lock

This is the startup switch of the engine. Turning the key to the corresponding position can power on the whole system, and turning the key to the startup position can switch on the engine.

5. Working mode

If this rotary switch is set at the “Operating” position, the crane is at the working condition and can operate normally.
If this rotary switch is set at the “Assembling” position, the crane is at the assembling condition and can assemble/disassemble.

⚠ CAUTION

Under Assembling condition, all the limit switches but over-hoist limit switch, over roll-out limit switch and boom upper limit switch fail to function.

6. Main hoist

When this rotary switch is set at the “Lock” position, the main hoisting winch is locked and cannot work; when this rotary switch is set at the “Unlock” position, the main hoisting winch is unlocked and can work normally.

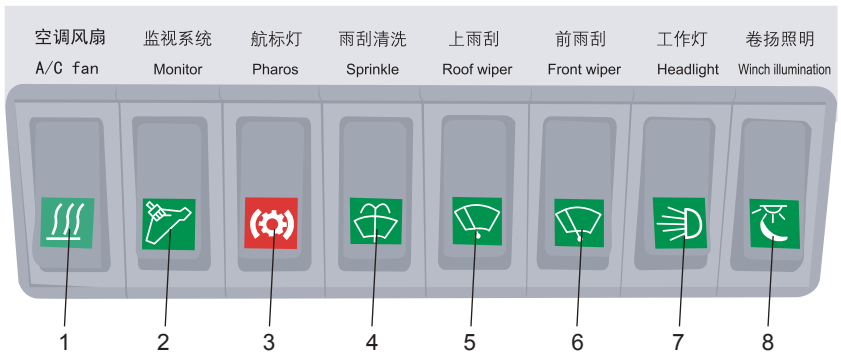
7. Aux. hoist

When this rotary switch is set at the “Lock” position, the auxiliary hoisting winch is locked and cannot work; when this rotary switch is set at the “Unlock” position, the auxiliary hoisting winch is unlocked and can work normally.

8. Main Luffing

When this rotary switch is set at the “Lock” position, the main luffing winch is locked up and can not work; when this rotary switch is set at the “Unlock” position, the main luffing winch is unlocked and can work.

2.2.3 Top Control Panel



Top Control Panel

Note: Press the rocker switch at the side printed with icon can achieve its corresponding function.

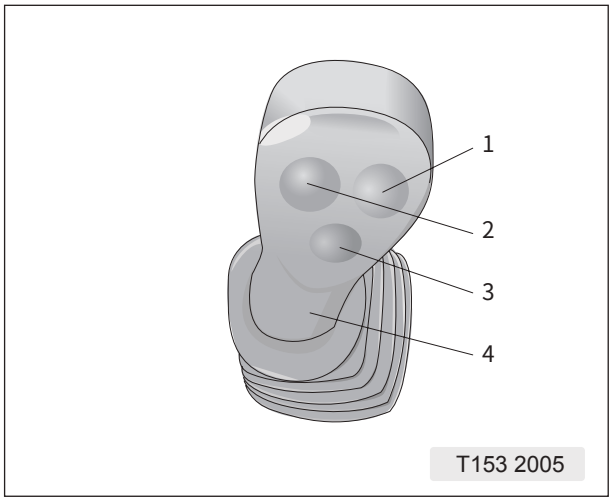
Table 2-16 Functions of Rocker Switches on the Top Control Panel

No.	Name	Function
1	A/C fan	Opening the vent fan of air conditioner
2	Monitor	Controlling the monitor manually
3	Pharos	Opening the pharos
4	Sprinkle	Cleaning the wipers
5	Roof wiper	Controlling the roof wiper
6	Front wiper	Controlling the front wiper
7	Headlight	Controlling the headlight and instrument light
8	Winch illumination	Opening illuminators on the platform

□2.2.4A Control Levers (Kawasaki Hydraulic System)

2.2.4.1 Left Control Lever

The left control lever mainly controls the hydraulic actions of aux. hoisting winch and slewing, and the buttons on it with function of slewing brake/relief and horn in respect of electric characteristic. See Fig. T153 2005.



Left Control Lever

⚠ CAUTION

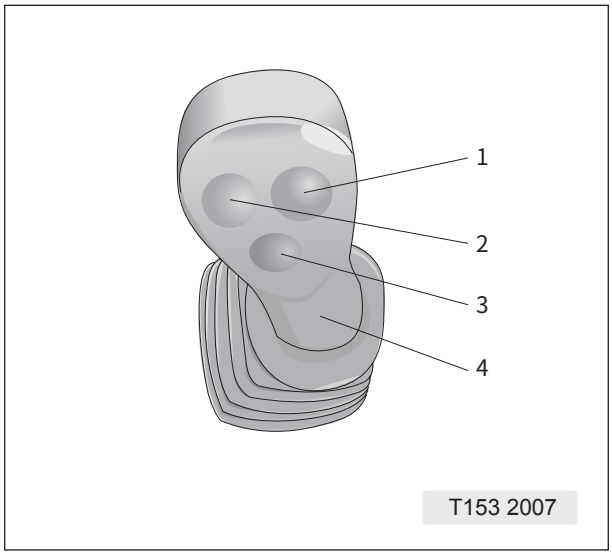
Push the Slewing brake/relief button when free slipping is required to act. Free slipping is allowed only after the slewing brake is released.

Table 2-17 Functions of Buttons on the Left Control Lever

No.	Name	Function
1	Slewing brake/relief	Auto-reset button. Press once, the slewing brake is released and can slew. Press for a second time, the slewing brake is engaged and can not slew.
2	Standby	Press this button to sound the horn, and the horn will sound
3	Horn	automatically when over loading.
4	Left control lever	Controlling the aux. hoisting winch and slewing operation

2.2.4.2 Right Control Lever

The right control lever controls the hydraulic actions of main hoisting winch and boom luffing winch, and the buttons on it can also mute the alarm and sound the horn in respect of electric characteristic, see Fig. T153 2007.

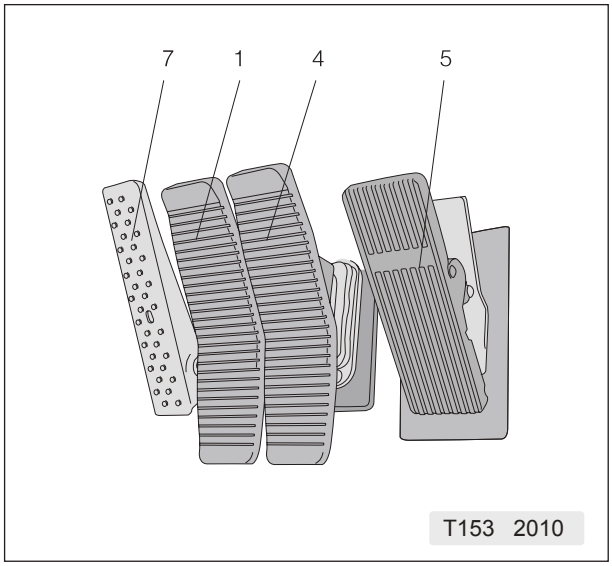


Right Control Lever

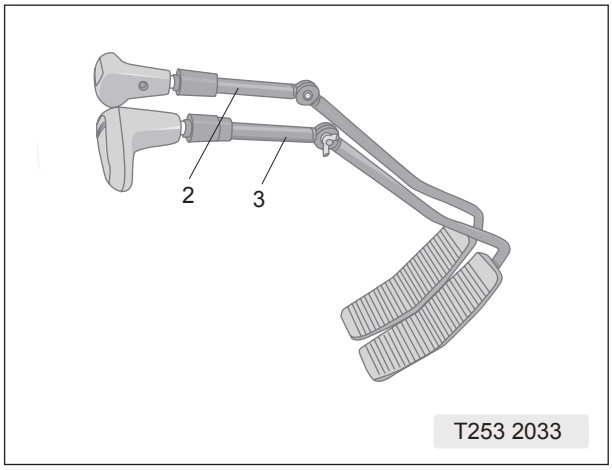
Table 2-18 Functions of Buttons on the Right Control Lever

No.	Name	Function
1	Mute	Auto-reset button. Press once, the sound alarm raised by the buzzer in the cab is stopped. When new fault emerges, the buzzer will sound alarm again. In addition, press this button can also mute the horn that sounds alarm of system overload.
2	Standby	
3	Horn	Press this button to sound the horn, and the horn will sound automatically when over loading.
4	Right control lever	Controlling the main hoisting winch and the boom luffing winch.

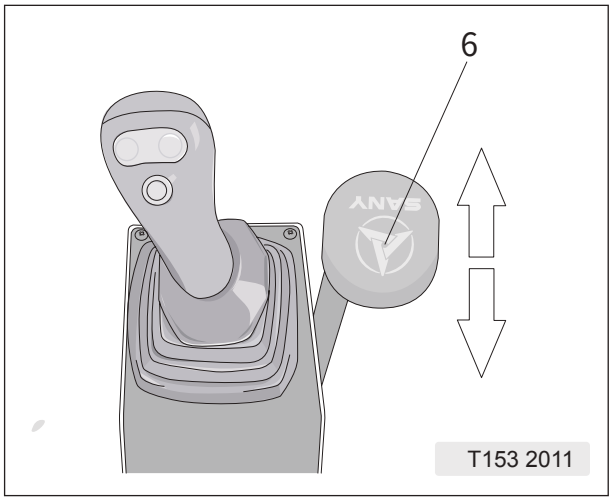
2.2.5 Pedals and Function Locking Lever



Pedals



Traveling Levers



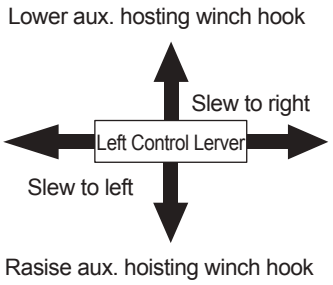
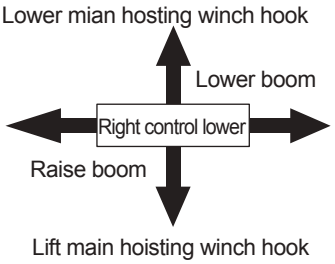
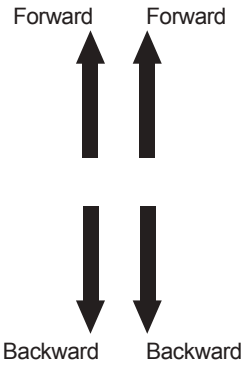
Function Locking Lever

Table 2-19 Functions of Buttons on the Right Control Lever

No.	Name	Function
1	Left traveling pedal	Controlling the left crawler to travel forward or backward.
2	Left traveling lever	Same as that of the left traveling pedal (Controlling the left crawler to travel forward or backward).
3	Right traveling lever	Same as that of the right traveling pedal (Controlling the right crawler to travel forward or backward).
4	Right traveling pedal	Controlling the right crawler to travel forward or backward.
5	Accelerator pedal	Controlling the power and rotational speed of the engine.
6	Function locking lever	⇧ indicates that the pressure in the servo circuit recovers,at which time all the control levers can function normally. ⇩ indicates that the servo circuit is relieved, at which time all the control levers fails to function. When startup the engine, the function locking lever must be set at this condition.
7	Free fall pedal (If the Free fall function selected)	Control braking of the winch in free fall condition. **⚠ CAUTION** It is only allowable to operate the pedal during free falling condition.

2.2.6 Movements of Control Levers

Table 2.20 Functions of Control Levers

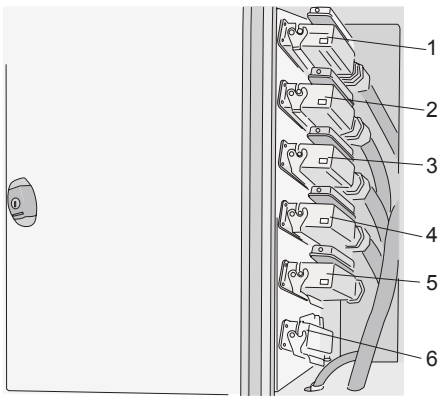
No.	Name	Function	Corresponding Operation
1	Left control lever	Move the left control lever backward to lift the aux. hoisting winch hook, while move it forward to lower the aux. hoisting winch hook. Move the left control lever to right side to rotate the upperworks clockwise, while move it to left side to rotate the upperworks counterclockwise.	
2	Right control lever	Move the right control lever backward to raise the main hoisting winch hook; Move right control lever forward to lower the main hoisting winch hook; Move right control lever to left side to raise the main boom; Move right control lever to right side to lower the main boom.	
3	Traveling pedal/ Traveling lever	Move the left traveling lever forward to drive the left crawler forward; Move the left traveling lever backward to drive the left crawler backward; Move the right traveling lever forward to drive the right crawler forward; Move the right traveling lever backward to drive the right crawler backward; The operations of the left/right pedals are exactly the same as those of the left/right levers. Press down the front of the left traveling pedal to drive the left crawler forward; Press down the rear of the left traveling pedal to drive the left crawler backward; Press down the front of the right traveling pedal to drive the right crawler forward; Press down the rear of the right traveling pedal to drive the right crawler backward.	

No.	Name	Function	Corresponding Operation
4	Accelerator rotary switch/pedal	When turn the accelerator rotary switch clockwise or press down the accelerator pedal, the rotational speed and output power of the engine are increased. Vice versa, when turn the accelerator rotary switch counterclockwise or release the accelerator pedal, the rotational speed and the output power of the engine are decreased.	

2.3 Emergency System

The SCC1000C crawler cranes are equipped with emergency response system in case of control system failure, see Fig. T253 2031:

No.	Name
1	Plug 1
2	Plug 2
3	Plug 3
4	Plug 4
5	Plug 5
6	Socket 6



T253 2031

Activate the emergency response system as the following procedures in case of control system failure:

1. Shut off the engine and power supply of system.
2. Pull out the fourth plug at the distribution box.
3. Open the emergency socket, that is, the sixth socket at the distribution box.
4. Insert the forth plug which was pulled out in Procedure 2 into the sixth socket.
5. Open the system power supply and start the engine.

⚠ CAUTION

When the emergency response system is activated, the ignition time should not be controlled by controller. It can not be longer than 15s lest startup motor damaged.

When the emergency response system is activated, only the following operations are allowable:

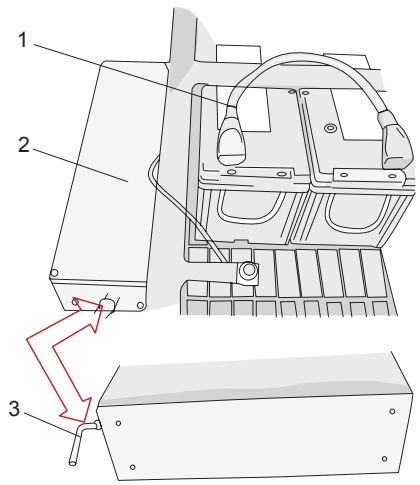
No.	Name	Function
1	Left/right control levers	Slewing, lifting and lowering main/auxiliary hoisting winch hook and luffing main boom
2	Left/right traveling levers	Driving the left/right crawler to travel
3	Left/right traveling pedals	Driving the left/right crawler to travel

⚠ CAUTION

-- When a fault occurred to the control system, all the electric system cannot work and only the hydraulic operations are allowed.
-- When the emergency response system is activated, the safety devices are out of commission, at which time, the operator is required to be alert to operation safety. And the boom luffing angle must not exceed the upper limit.

2.4 Batteries

The overall crane voltage is DC24V, supplied by 2 batteries connected in series. They are mainly used to start the engine, supply power for the electric control cables and illuminating equipment. The generator produces electricity to charge the battery and supply power for electrical equipment. If the crane is to be out of use for a long period of time, the main switch of the batteries must be turned off. The batteries are located in the front of the left platform. Batteries and circuit are controlled to cut off or close by the main switch on the contactor junction box which is next to the batteries, see Fig. T253 2032.

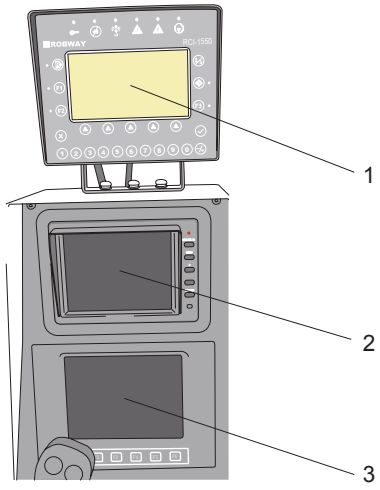


T253 2032

No.	Name
1	Battery
2	Contactor junction box
3	Main switch

2.5 Combined Instruments, Load Moment Limiter and Monitor

Detailed specification on load moment limiter, combined instruments and air conditioner please refer to the corresponding operation manuals provided by their suppliers. The detailed specification is also included in Section 2 Appendix of this manual for your reference.



T153 2012

No.	Name
1	Display of load moment limiter
2	Monitor display
3	Combined instruments

□2.6 Remote Monitoring System

The SCC1000C crawler cranes are equipped with a remote monitoring system.
The remote monitoring system can detect and transmit information of the crane such as location and working status to a special server through GPS and GPRS equipments. The clients can access such information or raise a requirement on the server through the internet. Hence, the system can assist the clients to manage the crane, as well as carry out efficient and quality maintenance services to the crane, making the after-sales services more active and customer-oriented.

The remote monitoring system can offer the following services to the clients:
-- GPS locating via multiple displaying methods such as electronic maps and Google maps, which provides the clients with the real-time and accurate location of the crane.
-- Monitoring the real-time operating condition, working status of the electrical parts, and operating status, which provides the real-time operation condition to the clients.
-- Providing real-time fault and alarm prompt, fault diagnosis, and trouble shooting guide, which can improve the after-sales staff's efficiency of fault detecting and troubleshooting.
-- Recording and permanently storing data of operating condition, lifting status, fault, and alarm since the date of sale.
-- Offering humanistic maintenance reminder by real-time reminder on the website or by text massage reminder, allowing the clients aware of maintenance of the crane timely.
-- Detailed statistics of operation status, which records information of ignition frequency, starting and ending time, and operating interval. The client can access to all such information only by internet.

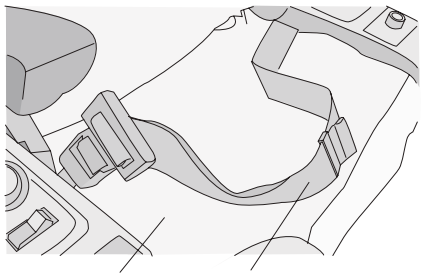
⚠ CAUTION

Do not dismantle or shield the antenna on a crane which is equipped with such a system; otherwise, this system cannot work correctly.

2.7 Seat

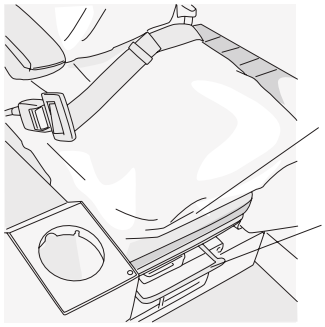
Note: The seat is equipped with an interlock switch, that is, when the operator leaves the seat, the servo system becomes discharged and all the control levers become out of commission, which can avoid mis-operation. This switch acts the same function as that of the function locking lever. If anyone of them is at discharge station, the hydraulic system becomes discharged.

1. Seat



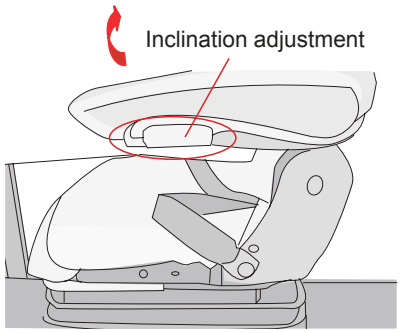
T253 2015

2. Adjusting the seat forward and backward



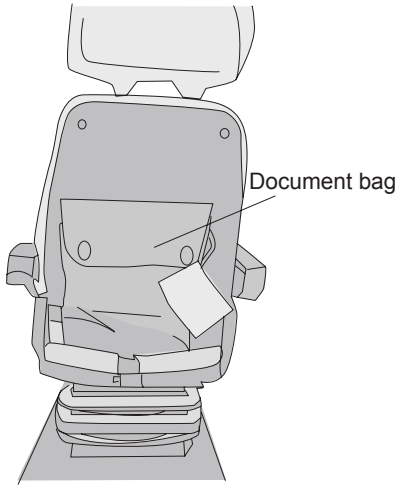
T253 2016

3. Adjusting the inclination of armrests



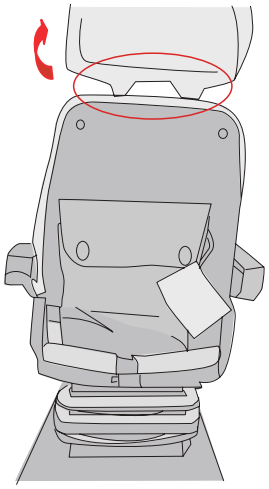
T253 2017

4. Document bag

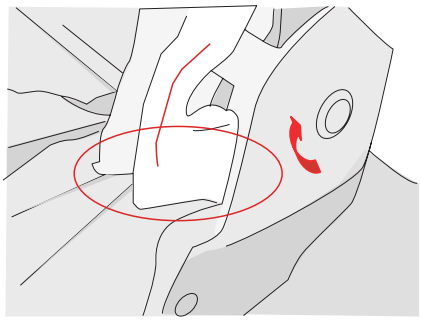


T253 2018

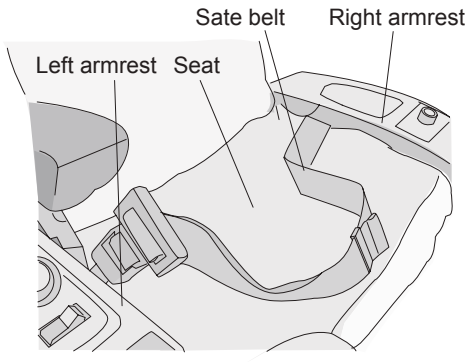
5. Adjusting the headrest


T253 2019

6. Adjusting the inclination of backrest

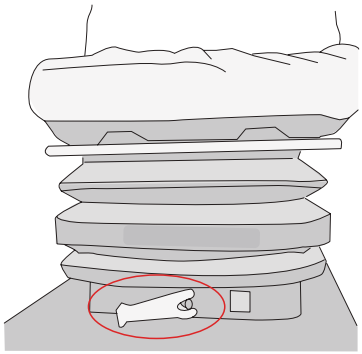

T253 2020

7. Elastic or non-elastic seat belt



T253 2021

8. Weight adjustment (50kg~130kg) (110lb~287lb) and shock-absorbing suspension design



T253 2022

⚠ CAUTION

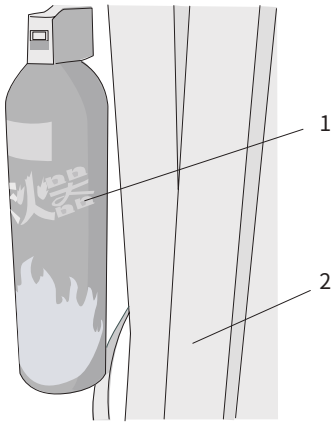
-- Before removing the headrest, raise it first and take away the springs under the pad.
-- The configuration of each seat may vary from batch to batch.

2.8 Other Facilities

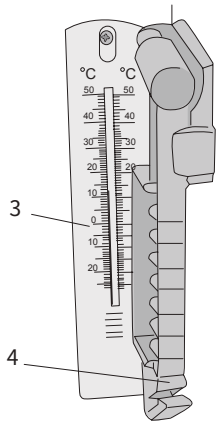
Fire extinguisher, thermometer, emergency hammer, curtain, and safety signs, load chart see the following figures:

Other Facilities in the Operator's Cab

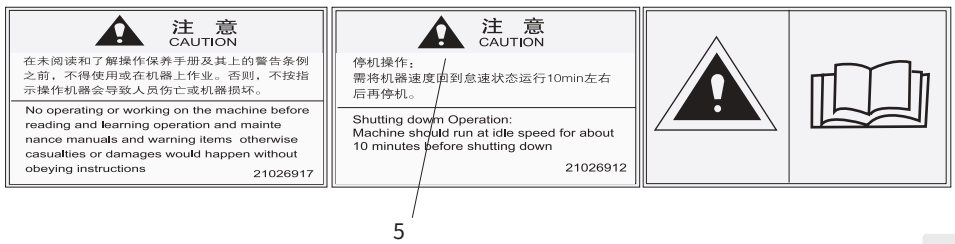
No.	Name
1	Fire extinguisher
2	Curtain
3	Thermometer
4	Emergency hammer
5	Signs inside the cab



T253 2023



T253 2024



T253 2025

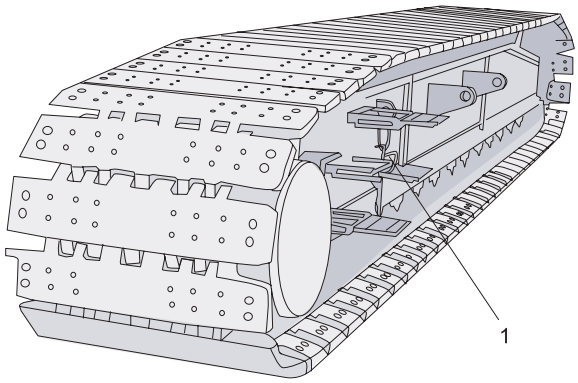
Other Facilities in the Driver's Cab

2.9 Entering/Leaving Operator's Cab

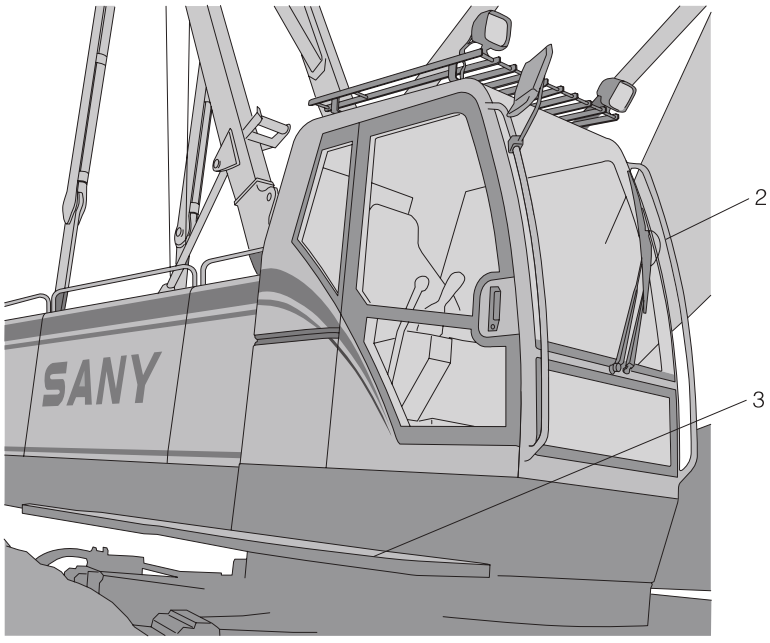
In addition to the proper auxiliary equipment, it also requires safety equipment like steps, catwalks, and handrails for entering or leaving the operator's cab.

2.9.1 Steps and Catwalks

The safety devices, such as steps installed at outside of the crawler frames, catwalk outside the cab, and handrails on them, all of which ensure the operator's safety to enter the cab, see the following figure:

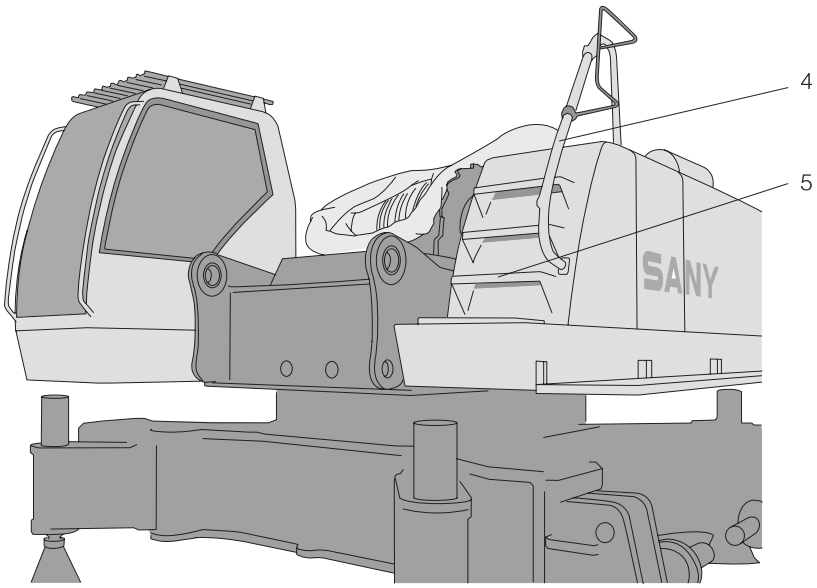


T253 2026



T253 2013

2.9.2 Ladder at Upperworks



T153 2014

No.	Name
1	Steps at outside of the crawler
2	Handrail outside the cab door
3	Catwalk outside the cab door
4	Handrail at upperworks
5	Step at upperworks

2.9.3 Precautions

1. Keep the upperworks parallel to the crawlers when parking the crane.
2. Pull out the steps at the outside of the crawler from vertical position to horizontal position (as the position shown in Fig. T253 2026).
3. Mount the crawler via the steps shown in Fig. T253 2026.
4. When standing at the catwalk outside the cab, open the sliding door of the cable shown in Fig. T253 2013.
• Open the lock with the key;
• Pull the handle towards outside to detach the lock cylinder;
• Push the door backward along the sliding track to open it;
• When the door is pushed to the terminal position, rotate the latch in the cab to lock the door manually.
• Enter the cab via the catwalk outside the cab shown in Fig. T253 2013.
5. When carry out maintenance on the upperworks, it is required to use the handrail to ensure safety as shown in Fig. T253 2014.

6. There are two terminal positions of the cab door, i.e. when it is completely closed or opened, the door will be locked at the position automatically. Be sure that the door is locked during the operation of the crane so as to avoid crushing or impact hazard caused by the accidental movement of the door.
7. There is potential danger of crushing between the door and the cab frame.

⚠ WARNING

Leave the cab in exactly the reverse order as that of entering the cab.

⚠ WARNING

Crushing and impact hazard!

⚠ CAUTION

Please open or close the door carefully so as to protect the hands from dangerous areas!

3 Engine

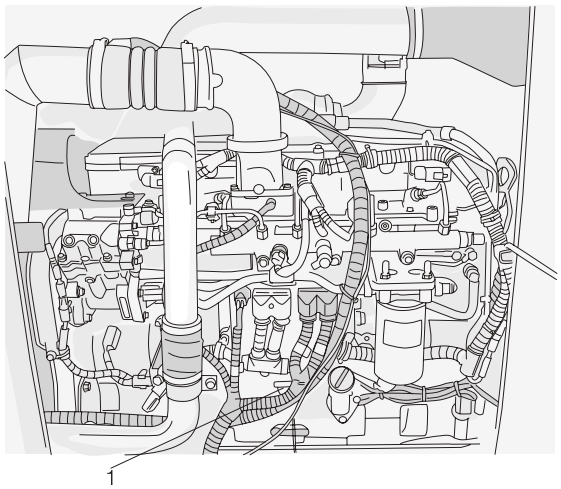
⚠ CAUTION

The operating manual provided by the manufacturer for QSL9 engine must be observed strictly.

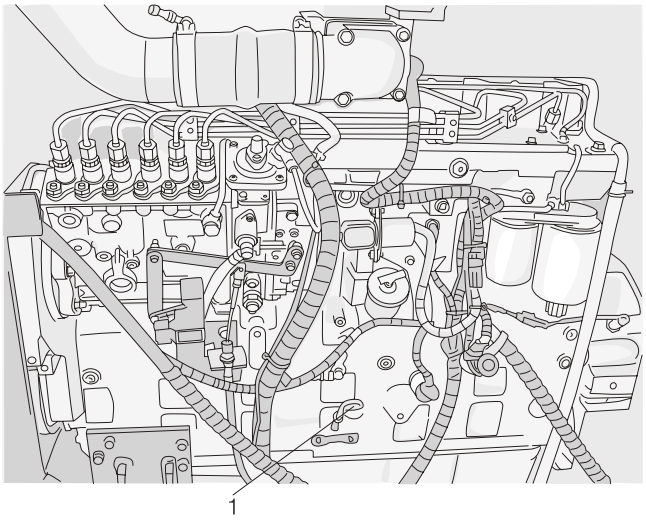
3.1 Inspection before Starting the Engine

Table 2-22 Inspection before Starting the Engine

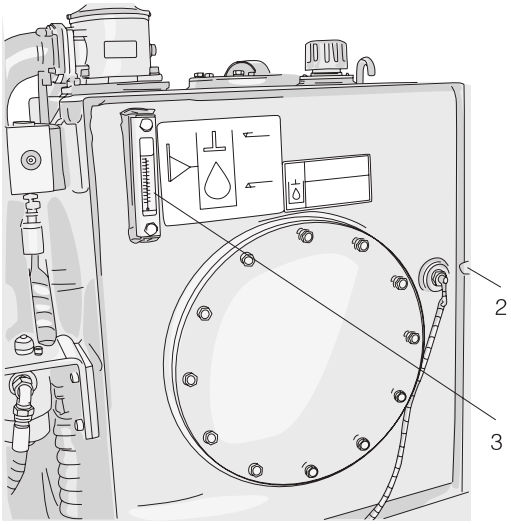
Task	Service Point
Check engine oil level in the engine and refill it if necessary.	Dipstick (1)
Check whether there is enough coolant and refill if necessary.	Inspection hole on expansion water tank (5)
If the level of coolant is too low, check whether return circuit of the coolant is damaged.	Coolant pipelines, hoses and heat radiator
Check hydraulic oil level	Sight glass on hydraulic oil tank (3)
If the oil level decreases, check the hydraulic system for leaks.	Pipelines, valves, oil cooler and hydraulic oil tank
Check the fuel system for leaks	Fuel circuit
Check fuel storage in the fuel tank	Fuel tank (6)



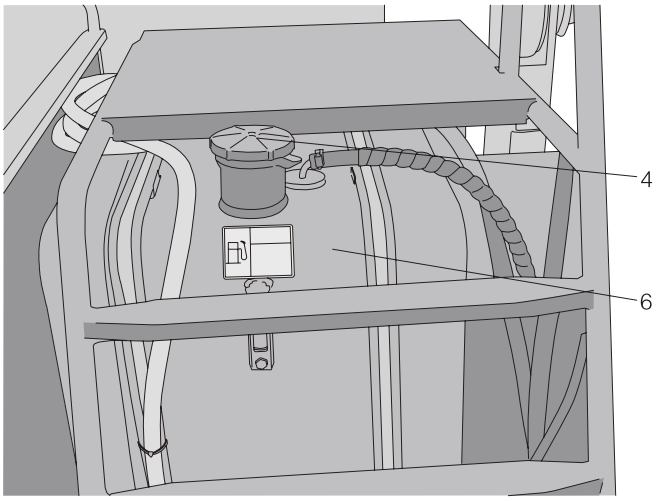
The Engine (Tier 3)



The Engine (Tier 2)

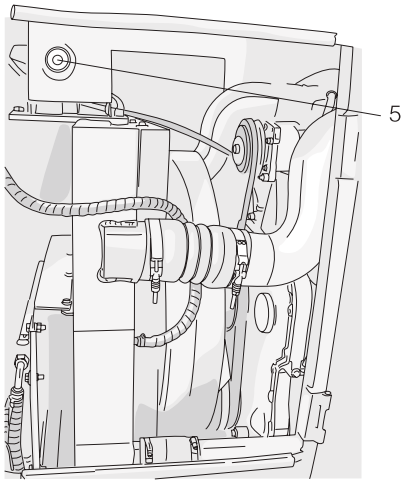


Hydraulic Oil Tank



T153 7002

No.	Name
1	Dipstick
2	Hydraulic oil tank
3	Sight glass
4	Fuel inlet port
5	Inspection hole of expansion water tank
6	Fuel tank



T153 7022

3.2 Starting the Engine

-- The engine can only be started in a place with sufficient ventilation.
-- Before starting the engine, blow the horn to alert people to leave the dangerous area.
-- When there is a fault or warning sign inside the drive's cab, it is prohibited to start the engine.
-- Check whether all control levers are at OFF position to ensure that the crane and the load shall not move unexpectedly when the engine is started up.
-- Check whether all the other people have left the crane and the dangerous area surrounding before starting up the engine.

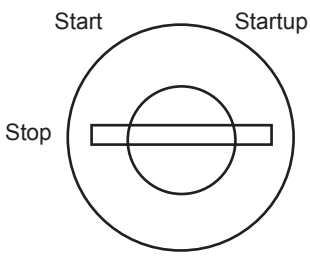
⚠ WARNING

Beware of accidents that may cause injury to people or damage to crane and property!

3.2.1 Starting Procedures

1. Before starting the engine, observe the following regulations: left control lever, right control lever and travel levers are all positioned at the mid-position (i.e. the OFF position). Set the accelerator rotary switch at the minimum position; keep the accelerator pedal at unengaged position; keep the function locking lever beside the right control panel is upright; and set the emergency stop button on right panel at unengaged position.
2. Insert the ignition key and keep the initial status at the stop position.
3. Turn the key to the "ON" position to power on the system. After waiting till images appear on the displays and become stable (About 15 seconds), press the horn button on both the right and left control levers to warn working personnel around.

The ignition key is a 3-position switch (see Fig. T253 7025)
Stop--the OFF position. When it is required to switch off the engine, turn the key to this position and then take off the key.
Startup--the starting position. Once the ignition key is turned at this position, the contactor is in action to start the engine.



T253 7025

4. At normal temperature, turn the ignition key to the Startup position and keep the time no more than 3 seconds; while the water temperature in the engine is lower than 2°C (**which is shown on the combined instruments display**), turn the ignition key to the Startup position and keep the time no more than 5 seconds. When the sound of engine started is heard, release the ignition key and it can return to the Start position automatically, at which time the engine is in normal working condition.
5. After the engine is started, check whether all data shown on the combined instrument display are normal. If anything found abnormal, the engine must be switched off and checked. **Before the value of engine oil pressure appears on the display, it is not allowed to raise rotational speed of the engine.**
6. If the engine startup fails for 3 times successively, the engine must be checked.

⚠ CAUTION

-- Rising edge of ignition signal is used to start the engine, that is, the ignition switch is just required to stay at the Startup position for 2 seconds, not all the time.
-- If the first startup fails, the re-ignition can only be carried out after waiting for (Attention: during which time the key switch stays at the start position to keep the system is powered on) 10 seconds at least. Otherwise, the re-ignition signal sent within the 10 seconds after the first ignition will be ignored by the control system. If the re-ignition fails again, it is required to wait for another 20 seconds at least before igniting for the third time. Otherwise, the ignition signal sent within the 20 seconds after the second ignition will be ignored by the control system. Similarly, if ignition for the third time fails too, the waiting period for the next time ignition will prolong to 3 minutes. Otherwise, the ignition signal sent within 3 minutes will be ignored by the control system. At this point in time, it is required to find out the cause first.
-- When the temperature is low and startup is difficult, a 220V external power supply shall be connected to the special interface used to heat up coolant and engine oil of the engine (there is a marking of power interface on the engine) before starting the engine again.

⚠ CAUTION

The standard time of preheat is 15s~20s, and no more than 40s strictly.

3.2.2 Engine Warm-up

After being started, the engine shall run for 5-10 minutes without load at a speed less than the moderate speed. This time period can be doubled in chilly weather. Then the function locking lever can be lowered down, and the hydraulic system will regain servo pressure (conditions for the hydraulic system to gain servo pressure: in working mode, engine started, operator seated, function locking lever put down) and can work normally.

⚠ WARNING

-- Beware of damages to the engine!
-- Never run the engine at idle speed for a long period of time so as to prevent damage to the engine.

3.2.3 Cautions after Startup

-- Operate the engine at idle speed for a few minutes before attaching a load **until the water temperature reaches approx 70℃(158℉) (which is shown on the combined instruments display), at which time it is allowed to attach the load.**

-- In any of these cases, the engine must be shut off immediately:

• Engine oil pressure is abnormal or varies greatly.

• With the position of accelerator pedal and accelerator rotary switch unchanged, the performance and working speed decline.

• Excessive exhaust emission.

• Abnormal coolant temperature and engine oil temperature.

• Sudden abnormal noises on the engine or turbo-charger.

If the temperature of hydraulic oil is higher than 80°C (i.e. the system thermal balance temperature), further operation may lead to damages to the hydraulic components. At this point in time, the inspections of the hydraulic system shall be carried out.

⚠ WARNING

ware of damage to the mechanical instrument!

3.3 Checks with the Engine Running

When the engine is running, it is required to check the combined instruments regularly.

-- Engine oil pressure

The engine oil pressure can be read out on the combined instruments display. Value of the engine oil pressure should not fluctuate strongly at stable rotational speed.

If engine oil pressure is too low (less than 69kPa(10psi)), the engine must be switched off immediately. Use the troubleshooting table in the engine operating manual to find out the causes.

-- Coolant

There is an inspection window on the engine expansion water tank. If there is no coolant inside the glass window (when coolant is sufficient, the inspection hole will takes on the color of coolant), it indicates to refill coolant. Temperature of the coolant must be lower than 95°C when the engine is running. Pay attention to the combined instruments display to prevent the water temperature from becoming over-high.

3.4 Switching Off the Engine

Before stopping the engine, the following points must be observed:
-- Left control lever, right control lever and travel lever are at mid-position; pull up the function locking lever;
-- Set the rotary switches of main hoisting winch, auxiliary hoisting winch, slewing and luffing winch at the “Lock” position to lockup the action of these mechanisms.
-- Keep the engine running for about 5 minutes with no load before turning the ignition key to “Stop” position.
-- Remove the ignition key and lock up the door when leaving the cab.

⚠ WARNING

In case of emergency (such as the emergency occurs during lifting /lowering the hook or luffing the boom), press Emergency stop button can switch off the engine forcibly. Beware of accidents that may cause equipment damage or even personal injury and death, so the operation is only permitted in case of emergency.

⚠ CAUTION

When the crane is to be idled for a long period of time, please turn off the main switch of the batteries (The position of the main switch refer to the section of Operator’s Cab in this chapter).

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4 Safety Devices

4.1 Overview

The safety control system of this crane is built for high requirements to prevent the occurrence of accidents. The major safety devices include:

- **Load moment limiter**
- **Boom upper limit switch**
- **Over-hoist limit switch**
- **Over roll-out limit switch**
- **Boom back-stop**
- **Boom angle indicator**
- **Slewing locking device**
- **Hook clamp**
- **Winch brakes**
- **Pawl and ratchet device**
- **Anemometer**
- **Pharos**
- **Engine working indicator**
- **Slewing/traveling indicator and buzzer**
- **Horn**
- **Fault alarm indicator and buzzer**
- **Emergency stop button**
- **Function locking lever**
- **Gradienter**
- **Video monitoring system**
- **Rearview mirror**
- **Operation locking switches**
- **Combined instruments display**

⚠ CAUTION

As all these safety devices are extremely important to the operation safety of this crane. Therefore, check all these safety devices for normal function before operating the crane.

4.2 Types and Functions of Safety Devices

4.2.1 Load Moment Limiter

The load moment limiter, as a fully computer controlled safety control system, can not only automatically detect the actual load data and the angle of boom, but can also display operating parameters such as the rated load and actual load, and operating radius.

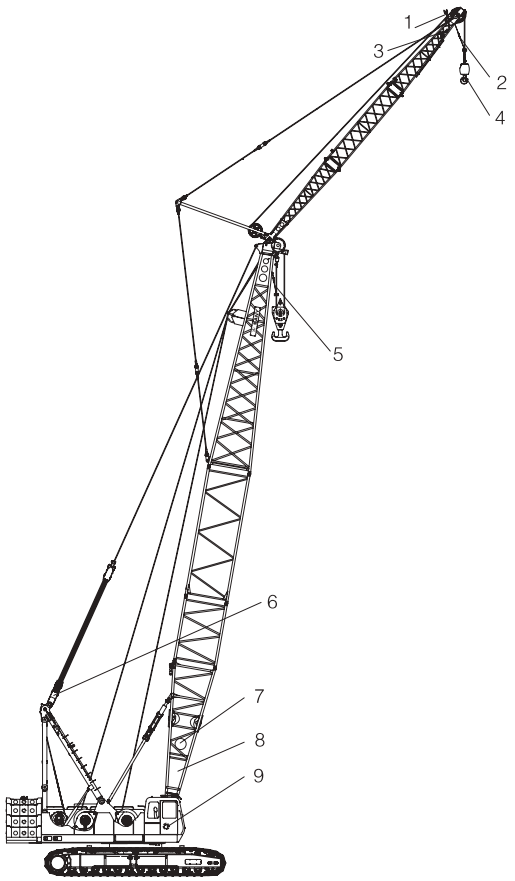
In normal operation, the load moment limiter can detect the causes of fault automatically, and raise alarm and cut off signals accordingly. In this way, actions prone to danger of the crane will be cut off automatically. In addition, a black box is installed to record the overload information automatically.

Composition: display, host computer, angle sensor and force sensor, see Fig. T153 8002

Force sensor: Detecting the pulling force that the boom pendants are bearing.

Angle sensor: Detecting boom luffing angle luffing angle.

Display: Installed inside the cab and showing all relevant load data.



T153 8002

No.	Name	No.	Name
1	Pharos	6	Pull sensor of load moment limiter
2	Aux. hoisting hook over-hoist limit switch	7	Boom angle sensor
3	Anemometer	8	Boom angle indicator
4	Hook clamp	9	Boom upper limit switch
5	Main hoisting hook over-hoist limit switch		

When actual load is less than 92% of rated load, “Green” light is on; when actual load exceeds 92% of rated load but less than 100%, “Yellow” light is on while buzzer on host computer of the load moment limiter begins to sound an alarm at intervals; when actual load is 100% of rated load, “Red” light is on; when actual load is 102% of rated load, “Red” light keeps on and the buzzer begins to sound a continuous alarm. In the meantime, the horn also blows (which can be muted by pressing mute button on the right control lever). As a result, the crane is only allowed to operate toward the safe direction.

In operating mode, the load moment limit restricts the boom lowering action.

In H and FJ operating conditions, boom angle shall not be less than 30°. When boom angle is less than 30°, boom lower action is automatically stopped by the load moment limiter.

If it is required to lay down the boom on ground to dismantle or adjust boom length, the Limit switch inside the cab should be set at Relief position. Then carry out the dismantling or assembling work. As the load moment limiter and hook over-hoist limit switches are out of commission and the whole crane is under no safety protection, a safety distance must be kept between the hook block and boom head.

Detailed instructions on load moment limiter please refer to the operating manual provided by the manufacturer in Section 2 Appendix.

⚠ CAUTION

-- On unsolid or uneven ground, the crane is forbidden to slew when the actual load reaches 92% of rated load so as to prevent occurrence of danger.

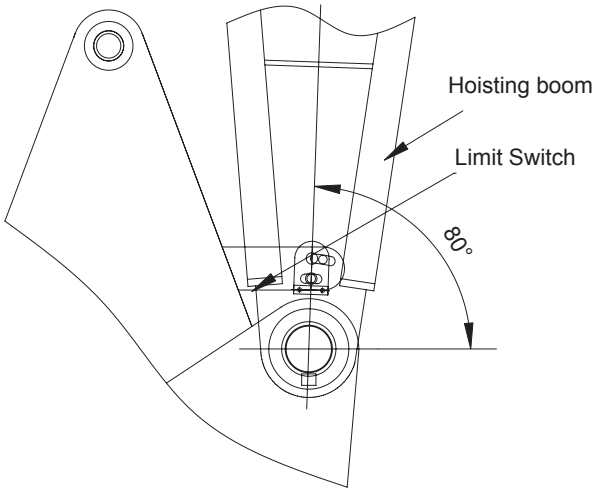
-- The load moment limiter is only designed to assist the crane operator’s work and it cannot replace or degrade the qualification requirements for the operator. The operator must possess corresponding knowledge, experience and judgement to ensure the safety in operation.

4.2.2 Hoisting Boom Upper Limit Switch

The hoisting boom upper limit switch, see Fig. T153 8008, is acting in H and FJ operating conditions. In H and FJ operating conditions, the limit switch is on when the boom angle is smaller than 80°, at which time the boom luffing operation is functioning normally. When main boom angle is approaching 80°, the limit switch is activated, and the solenoid valve controlling the main boom hoisting is cut off to stop hoisting the main boom. If the limit switch cannot fulfill these requirements, it shall be adjusted to the required condition.

⚠ CAUTION

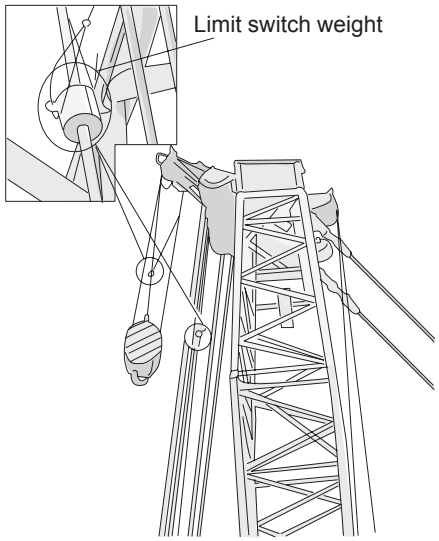
--These limit switches can be overridden by setting the "Limit" switch at the "Relief" position, and then the boom can be raised as specially required. But such operation must be carried out when safety can be ensured.
--In the Assembling mode, the boom upper limit switches are out of commission if the load moment limiter is not functioning normally. In such occasion, operation of raising boom must also be carried out when safety can be ensured.



T153 8008

4.2.3 Over-hoist Limit Switch for Main and Aux. Hoisting Hooks

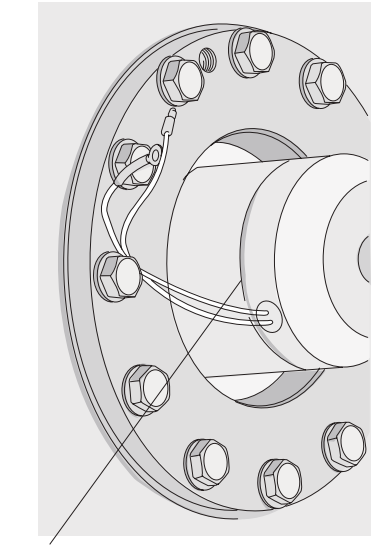
This switch is used to prevent the hook blocks from being over-hoisted. When the hook block is lifted to a certain height, the switch is activated and the hoisting action is cutoff hydraulically and electrically. As a result, the hook block can only be lowered down, see Fig. T253 8039.



T253 8039

4.2.4 Over Roll-out Limit Switch (3-wraps Protector)

When the wire rope is unwound with only three wraps left on the winch drum, this switch is activated and hook block lowering action is cutoff, which can prevent the wire rope from slipping off the winch drum. See Fig. T253 3021.



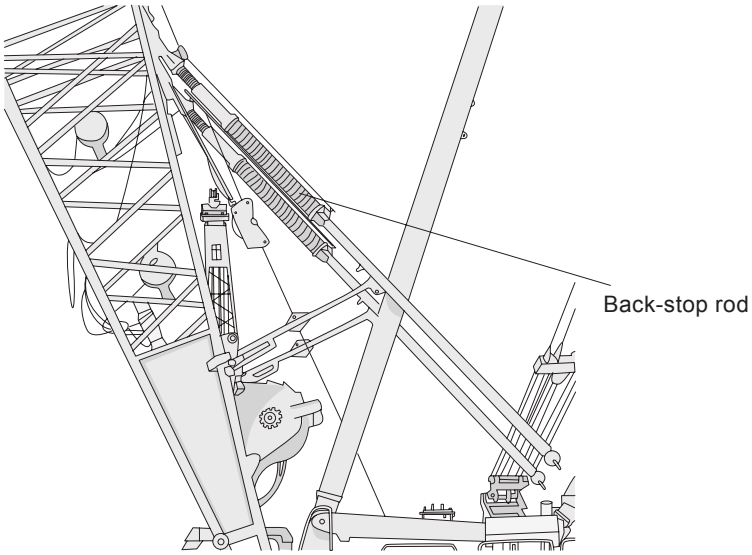
T253 3021

4.2.5 Boom Back-stop

The boom back-stop is located as shown in Fig. T253 8041. It is composed of upper tubes, lower tubes, and springs at root. When boom retroversion approaches a certain position, the springs will be pressed tight and hence generate bounce force to support the boom and prevent the boom from falling back further.

⚠ CAUTION

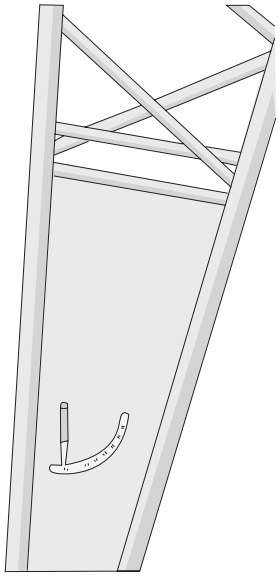
The boom back-stop device can only provide protective prevention to the boom against retroversion caused by vibration or impact, but no effect on that caused by power boom erecting.



T253 8041

4.2.6 Boom Angle Indicator

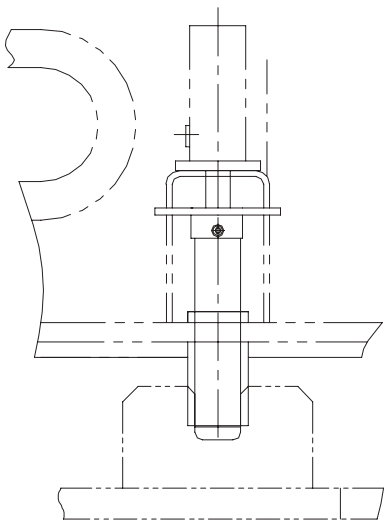
The pendulum-like angle indicator is installed at the boom base, see Fig. T253 8042.



T253 8042

4.2.7 Slewing Locking Device

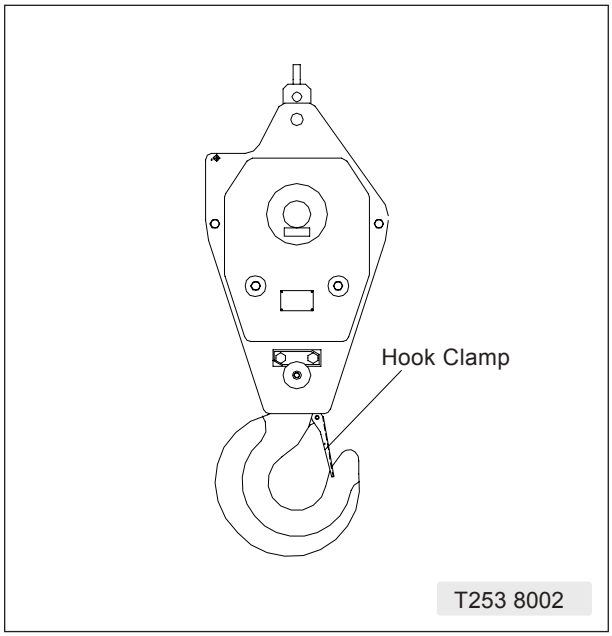
There are four mechanical locking pins which can lock the crane at the four directions. Slewing locking is controlled by the rotary switch “Swing ” on the left control panel. When the locking pins are not completely retracted, the slewing operation is forbidden. See Fig. T253 3014.



T253 3014

4.2 8 Hook Clamp

Each kind of lifting hook is equipped with a baffle to prevent the wire rope from falling off, see Fig. T253 8002.

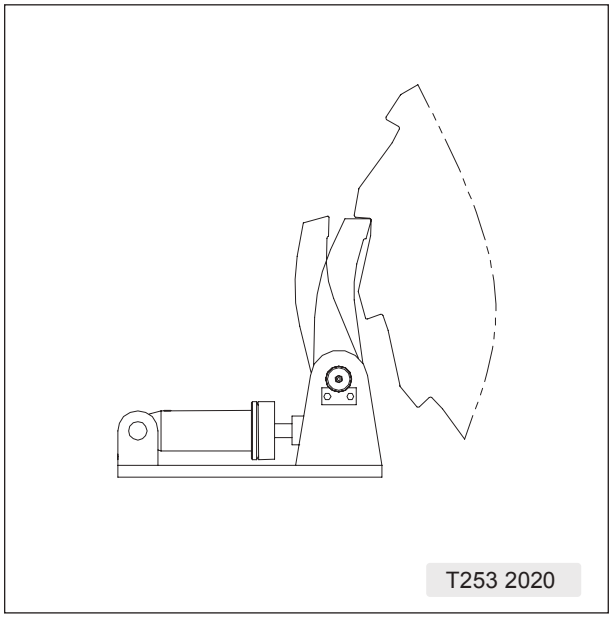


4.2.9 Winch Brakes

Each winch is installed with the normally closed, spring-loaded disk brake, which features large braking moment, maintenance-free, safe, reliable, and long service life.

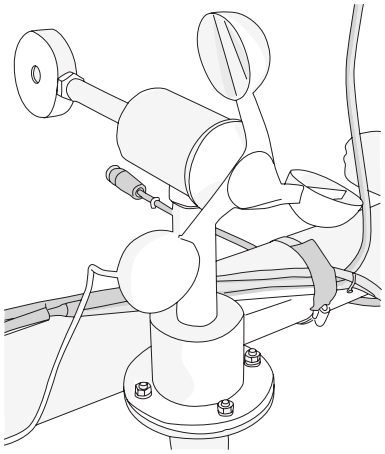
4.2.10 Pawl and Ratchet

The winch drums are installed with hydraulic pawl and ratchet devices. Operate the rotary switch on the left control panel and the hydraulic cylinder will act to release the pawl and ratchet locking, see Fig. T253 2020.



4.2.11 Anemometer

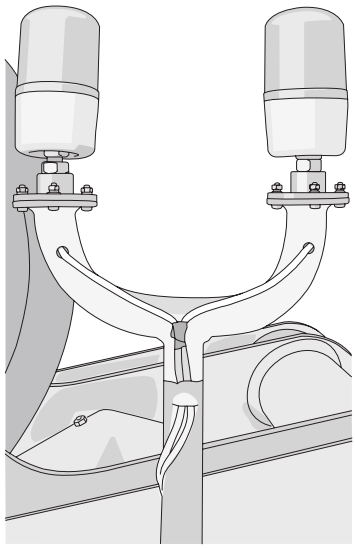
It is installed at the top of the boom to detect the real-time wind speed and transmit the data to the display inside the operator's cab. When the detected wind speed is larger than the set value (the default value is 16m/s(35.8mph)), fault indicator is on and buzzer sounds an alarm.



T253 2041

4.2.12 Pharos

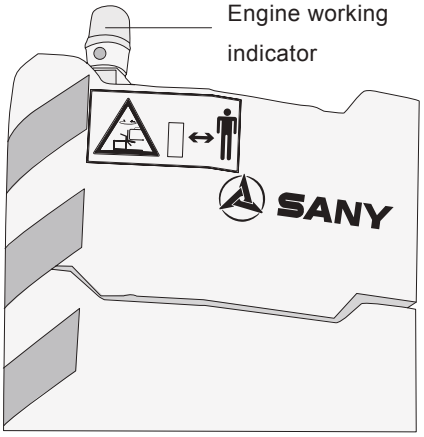
It is installed at the top of the boom system to send signal of height and hence allows the boom system to keep erecting at night, see Fig. T253 2042.



T253 2042

4.2.13 Engine Working Indicator

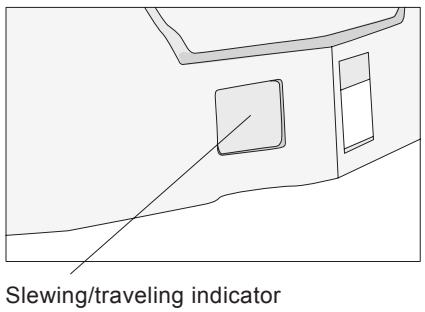
The engine working indicator is installed on the top of counterweight blocks. When the engine is running, the indicator flickers, see Fig. T253 2043.



T253 2043

4.2.14 Slewing/traveling Indicator and Buzzer

It is installed on the counterweight tray. When the crane is slewing or traveling, the indicator flickers and the buzzer sounds an alarm, see Fig. T253 2044.



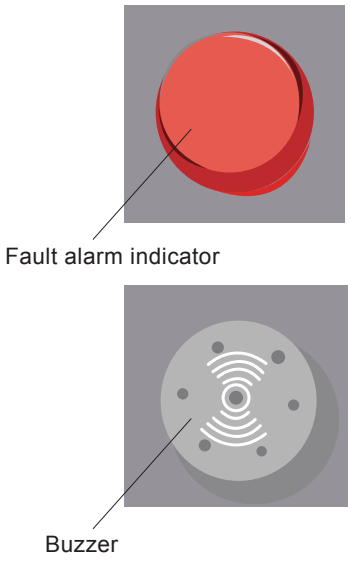
T253 2044

4.2.15 Horn

It is required to sound the horn before every operation to show a signal that the crane starts to work and to warn working staff around the crane of safety.

4.2.16 Fault Alarm Indicator and Buzzer

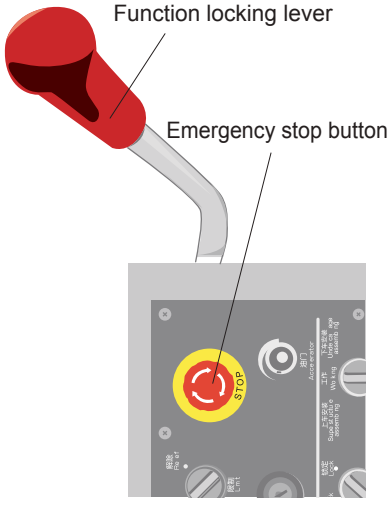
It is installed on the left control panel inside the cab. When the electrical system has a fault or some safety device are acting, the fault alarm indicator flickers and the buzzer sounds an alarm. See Fig. T253 2045.



T253 2045

4.2.17 Emergency Stop Button

It is installed on the right control panel in the cab. It can cut off all the actions of the crane, including stopping the engine, when an emergency occurs. See Fig. T253 2046.



T253 2046

⚠ CAUTION

Pressing this button when the equipment is running at high speed or a load is lowering down quickly may cause equipment damage or even personal injury and death.

4.2.18 Function Locking Lever

It is installed beside the right control panel. Pulling up this lever in the event of an emergency will unload the servo circuit. As a result, all the control levers are out of function, and it can prevent mis-operation caused by accidental body-touching when entering/leaving the cab. See Fig. T253 2046 (Further details refer to section 2 Operator's Cab).

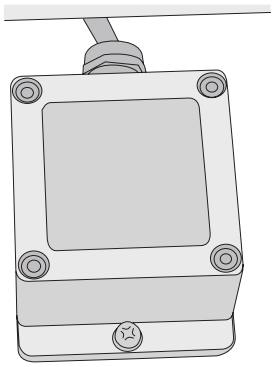
4.2.19 Seat Interlock

When the operator stands up or leaves the seat, the seat interlock switch will act to discharge the servo system, at which time all the control levers are out off commission and prevent some mis-operation. It has the same function as that of the function locking lever.

4.2.20 Gradienter

The mechanic gradienter is taken as the benchmark and the electronic gradienter functions indicating the real-time gradient of the crane and alerting the operator to ground condition. See Fig. T253 2047.

When gradient of the crane is detected larger than 3° by the electronic gradienter, the fault alarm indicator flickers and buzzer sounds an alarm.

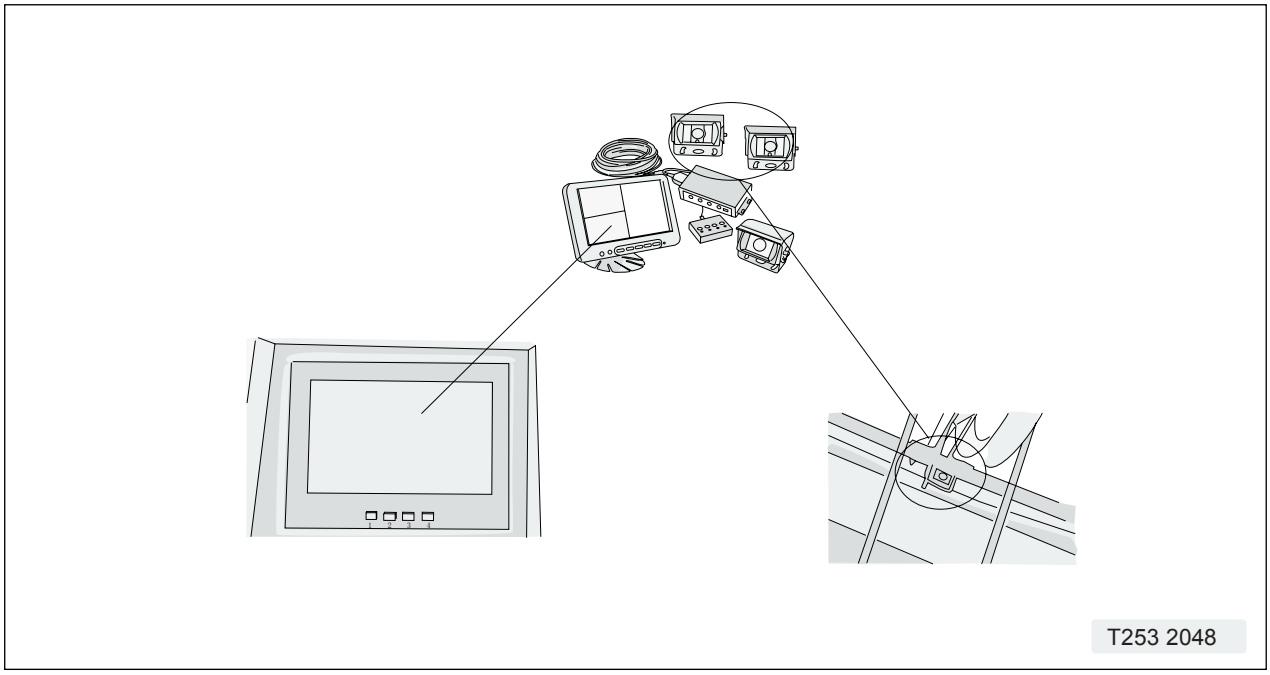


T253 2047

4.2.21 Video Monitoring System

The operator can see the real-time situation around the luffing winches, hoisting winches, and behind the carbody through the high-definition cameras and displays, see Fig. T253 2048.

If the crane is installed with mobile camera at boom/jib head, the situation around the camera can also be viewed.



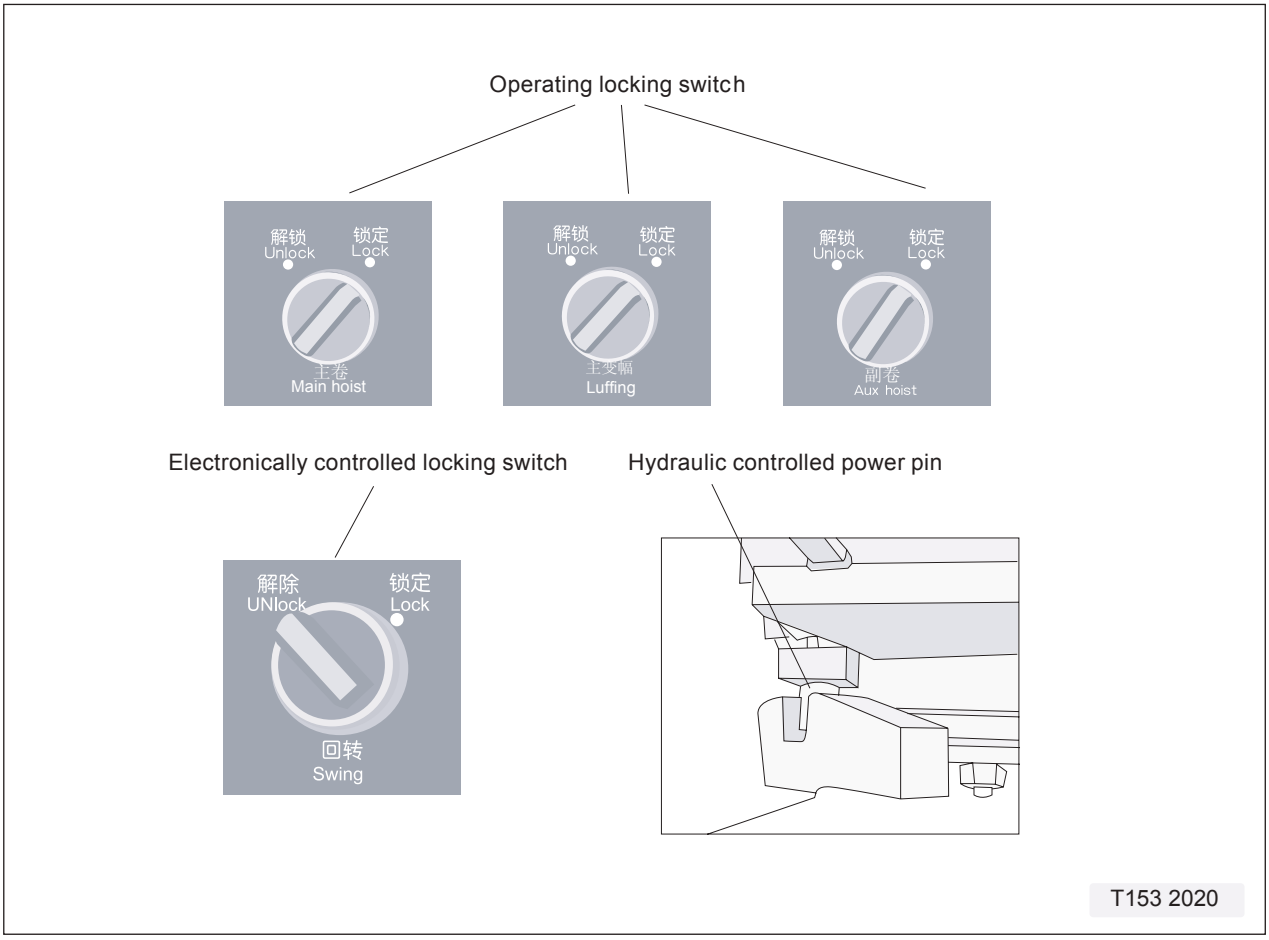
T253 2048

4.2.22 Rearview Mirror

The rearview mirrors are installed in front of the driver's cab and at the handrail on the left platform.

4.2.23 Operating Locking Switches

These switches include the locking switches of slewing, main hoisting winch, aux. hoisting winch, boom luffing winch (which are located on the right and left control panels), matched with slewing locking pins, luffing winch pawl and ratchet, and solenoid valves, can lock the motions of corresponding mechanism and prevent mis-operation, see Fig. T153 2020.



T153 2020

4.2.24 Combined Instruments Display

The high definition and true color display is the display terminal of the overall crane electrical system, showing engine working parameters, hydraulic system working state and parameters, parameters of all detecting points and output points of electrical system, and real-time parameters of ambient operating conditions.

4.2.25 Lightning Protection System

Please take these two measures to effectively prevent damage to the electrical circuits by lightning strike:

Measure 1: Pay particular attention to the weather forecast during the thunderstorm season. If the thunderstorm is imminent, stop all operations and lower the boom. Be sure that the peak of the boom is at least 5m lower than the surrounding buildings. All operating personnel leave the crane. Note: This is the most effective measure to prevent damage of a thunderstorm.

Measure 2: Ground the crawler crane reliably, and be sure that the ground resistance is less than 10 ohm.

⚠ CAUTION

If the ground resistance excesses 10 ohm, the function of the lightning protection system will be reduced and thus it cannot provide effective protection to the electrical circuits.
As the soil conductivity in different job sites varies, the lightning protection system universally installed to the crane by the manufacturer may not be able to provide sufficient grounding.

Please ground the crane in any of the following three methods:

Method 1: Check the ground terminals of tall buildings adjacent to the job site and use these terminals to ground the crawler crane.

Method 2: Dig a pit deeper than 3m and bury a frame welded by flat steel or angle iron and the area of the frame shall not less than 4m2.Connect a conduct wire with cross section no less than 35mm2 and 20m long as lightning protection ground wire. Fill the pit with granulated salt and charcoal to a proportion of 1:10 as resistance reducing agent, which means every 1kg granulated salt is mixed with 10kg charcoal, then fill the pit with earth.

Method 3: Connect the lightning protection system as soon as possible in the event of a thunderstorm with reference to recommended number of ground rods and installation procedures described bellow.

⚠ CAUTION

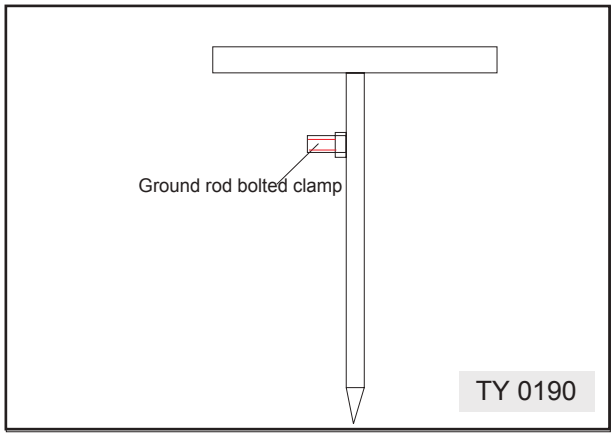
1. Sufficient grounding is essential to ensure the proper function of a lightning protection system. Be sure that the ground resistance is less than 10 ohm.

2. Enhance knowledge of lightning protection of the working personnel.
In case of a thunderstorm, stop operating the crane immediately and warn all people in the vicinity to leave the crane.
Evacuate the working personnel as soon as possible if a thunderstorm is coming. If the operator must leave the crane, he shall jump clear of the crane with both feet together and shall not touch any part of the crane.
If the operator is unable to leave the crane, staying in the cab seems to be relatively safe, but he shall not touch any part of the crane or ground.

Table of Recommended Number of Ground Rods

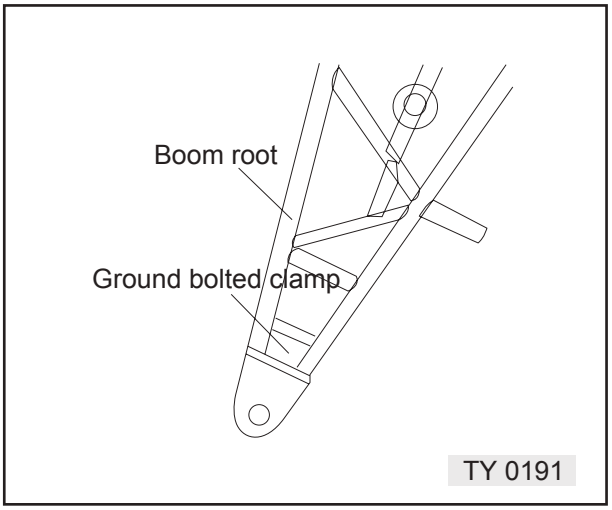
Type	Name	Recommended Number of Ground Rods
Soil	Pottery clay, peat, marl, swamp, smashed charcoal, black soil, garden soil, argil, malm, clay, sandy clay, loess, clay with sand, sandy soil, stony soil, weathered red clay on top and red shale on base, top soil-rock, base gravel	No less than 3
Sand	Sand, grit, sand in river shoal, grassland with deep ground water, surface clay no more than 1.5m and stone at bottom	No less than 5
Rock	Gravel, rubble, rugged mountain, granite	Cannot be used as ground terminals
Water	Sea water, lake water, pond water, muddy water, spring water, ground water, creek water, river water	1

1. Parts to install: 10628608 Ground Rod Q900.10 2.21.1 1 unit
60009914 Braided copper wire LT-TD50 1 piece
2. Installation method:
(1) Bury the full length of the ground rod into the earth.



TY 0190

(2) Connect one end of the braided copper wire to the ground rod bolted clamp with a nut, see Figure TY 0190.
(3) Connect the other end of the braided copper wire to the ground bolted clamp welded on boom root with a nut, see Figure TY 0191.
(4) Arrange the wires to keep them from interference with other parts.
After a thunderstorm while prior to operation, check electric devices for normal operation, in particular following parts:



TY 0191

(1) Force sensor
(2) Angle sensor
(3) Host computer of load moment limiter
(4) Anemometer
(5) Pharos
If there is any abnormality in signal transmission occurring to these devices after a thunderstorm, lower the boom and check the surge protector in the junction box on boom for damage. If the surge protector is found damaged, replace it immediately. The surge protection applied in this crane has a certain service life, which may be damaged after several thunderstorms or one severe thunderstorm. It, therefore, requires periodical check. Any surge protector found damaged must be replaced immediately.

5 Traveling Operation

5.1 Overview

-- Action

The traveling hydraulic motors drive the crawlers through speed reducers and drive wheels and achieves straight line traveling (forward or backward) and turning .

-- Braking

The traveling brake is blade-type, normally-closed, and built-in. It can compensate automatically, requiring no adjustment. When the traveling lever/pedal in the operator's cab is pushed/pressed down, the braking is released and the crane starts to travel.

-- Automatic Direction Changing

It ensures that the ahead of the operator's cab is always the ahead of the crane and that the forward operation of the traveling lever/pedal makes the crane travel forward and vice versa, no matter what the relative position of the uppperworks to the lowerworks is.

5.2 Precautions

Before Driving Operation

-- Planning the traveling route. The ground of the traveling route is required to be even, solid, and of sufficient load-bearing capacity. There shall be no obstacle in the air on the traveling route. If the obstacle in the air cannot be avoided, sufficient clearance must be ensured between the obstacle and the crane. When traveling near electric power wires, an extra clearance of 10m(32'10") must be ensured. A signalman shall be employed if necessary.

-- Check whether the crawler tension needs to be adjusted. If necessary, adjust the crawler tensioning device to maintain the appropriate tension of the crawlers. The soil on the crawler pads should also be cleared.

-- Sound the horn before operation to warn people in surrounding area to leave.

-- Know the directions of frontward and backward before traveling. If the crane travels in an opposite direction with the expected direction, an accident may happen.

-- Make sure that the crawlers are extended and the crawler traveling devices are at working station.

Traveling with a Load

-- When traveling on even and solid ground with gradient less than 1%, the crane shall be in positive position (i.e. the upperworks parallel with the crawlers), and the drive wheel shall keep at rear (especially on the ground with slightly bigger gradient).

-- When traveling with a load, the boom frame angle should be equal to or larger than the angle described in the load chart. But pay attention to maximum angle limits.

-- When traveling with a load, the suspended load should be as close to the ground as possible. The maximum height shall not be more than 0.5m(1'8"); a drag rope (cable) is also required to keep the load steady.

-- When the load is over 50% of the rated load, the crane must be kept at the positive position and the slewing lock be engaged.

--The rated load for a traveling crane must be less than the normal value. The lifting capacity also varies due to different operating conditions. For straight-line traveling with load in H operating condition, the safe working load shall not exceed 90% of the rated load; for turning with load in H operating condition, the safe working load shall not exceed 70% of the rated load. For straight-line traveling with load in FJ operating condition, the safe working load shall not exceed 50% or the rated load.

⚠ CAUTION

Before traveling with a load, make sure that pawl and ratchet device of luffing winch is engaged.

During Traveling

-- When traveling with no load, the hook block shall be lowered down to prevent it from colliding with the boom or fixed jib.

-- Check whether the hydraulic oil temperature, the traveling speed reducer, and the track rollers are normal.

-- When making turn on soft ground, avoid soil accumulating in track rollers and at the front of crawlers.

-- Driving, starting, turning, and parking of the crane shall be slowly and steadily.

-- Changing the traveling direction is only permitted when the crawlers are at a standstill.

⚠ CAUTION

Beware of impact to the boom system and load handling devices!
Beware of damage to the boom system!

⚠ CAUTION

Beware of damage to the crawler traveling devices (i.e. crawler pads, track rollers, crawler frame, etc.)!

-- Before crossing a bridge, check the bridge for sufficient load bearing capacity.

-- Keep a safe clearance from slopes and ditches (see **Safety Manual**).

-- When driving on soft ground, turn a certain angle, then travel forward or backward slowly to make the soil fall off the crawlers. Repeat this operation until the crawlers turn to the expected direction.

-- Avoid one-side crawler steering (see Fig. T103 6008) or spot turning (see Fig. T103 6005). Try large radius turns as much as possible (see Fig. T103 6009) so that both crawlers can get drive.

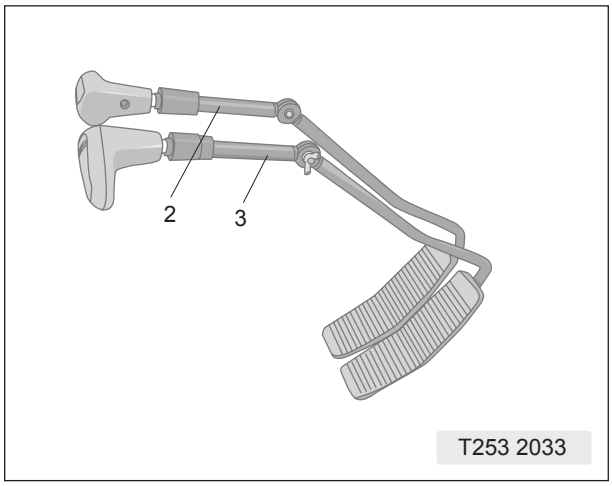
-- Clear the crawlers frequently when operate the crane on soil ground.

⚠ WARNING

Danger of splashing objects!
Too much soil accumulated at the guide wheels of the crawlers may cause over-tension to the crawler group. If the tension exceeds the limit, the crawler group may break and the crawler pads may splash in all directions. The splashing parts can cause a danger or damage.

5.3 Traveling Operation

5.3.1 Movement of the Traveling Levers



No.	Name	Function
2	Left traveling lever	Control the left crawler traveling (functioning the same as the left traveling pedal).
3	Right traveling lever	Control the right crawler traveling (functioning the same as the right traveling pedal).

⚠ CAUTION

Beware of damage to the brakes!
Move the control levers smoothly and steadily during operation. Move the control levers back to the mid-position rapidly may cause damage to the brakes!

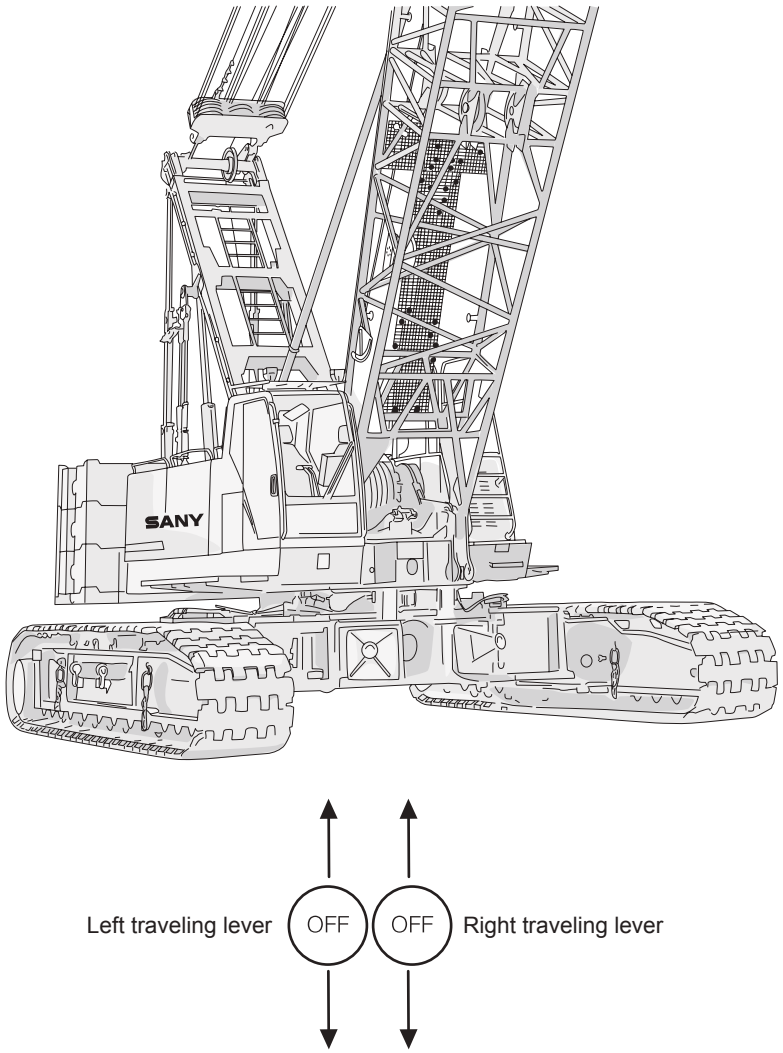
5.3.2 Combination Operation of Traveling Levers

The combined operation of left and right can change the crawler traveling direction as shown in Fig. T250 2033.

Table 2-23 Combination Operation of Traveling Levers

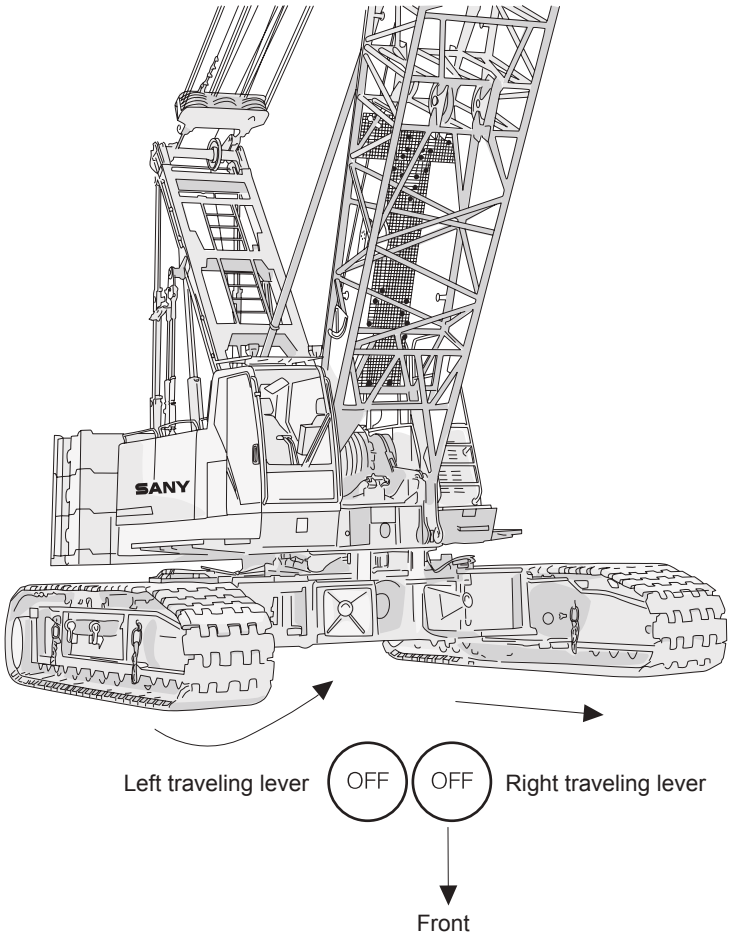
No.	Movement of Levers (2 + 3)		Movement of Crawlers		Movement of Lowerworks
	Left (2)	Right (3)	Left	Right	
1	Forward	Forward	Forward	Forward	Forward
2	Backward	Backward	Backward	Backward	Backward
3	Backward	Forward	Backward	Forward	Spot turning to left
4	Forward	Backward	Forward	Backward	Spot turning to right
5	--	Forward	--	Forward	Turn left and then forward
6	Forward	--	Forward	--	Turn right and then forward
7	Backward	--	Backward	--	Turn left and then backward
8	--	Backward	--	Backward	Turn right and then backward

-- If it is required to drive straight line (see Fig. T103 6007), distances of two traveling levers away from mid-position (OFF position) in expected direction must be the same.



T103 6007

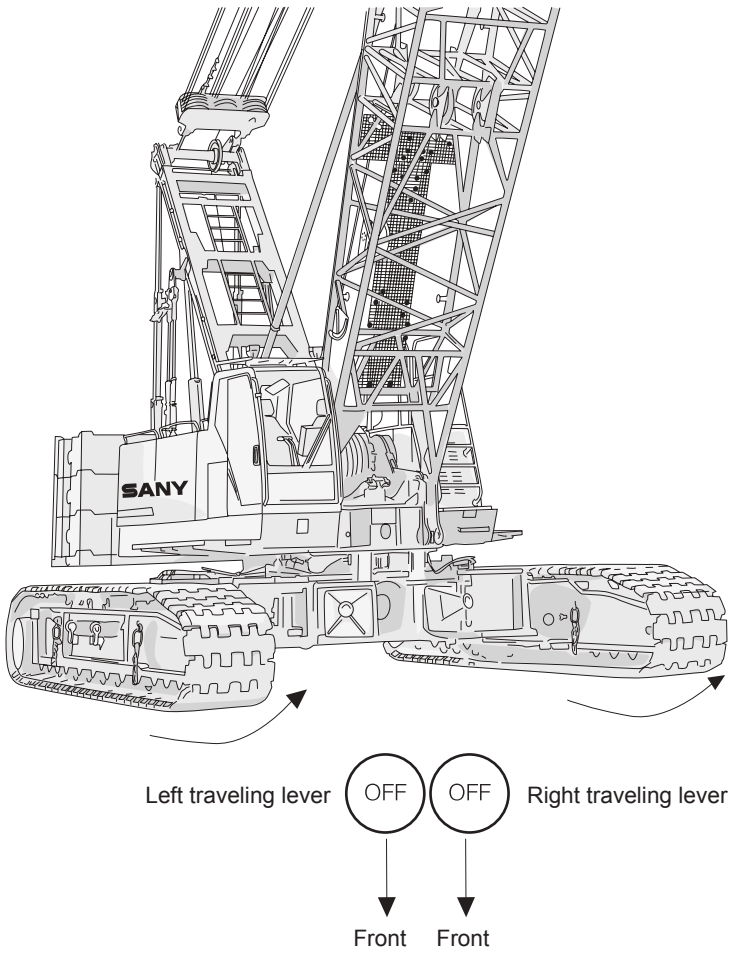
-- For an one-side crawler steering to left (see Fig. T103 6008), push right traveling lever forward from mid-position (OFF position) while remain the left traveling lever at mid-position (OFF position), and the crane will turn with the left crawler as the axis center.



T103 6008

-- For an one-side crawler steering to right, the operations of the left & right traveling levers are opposite to that in the one-side crawler steering to left.

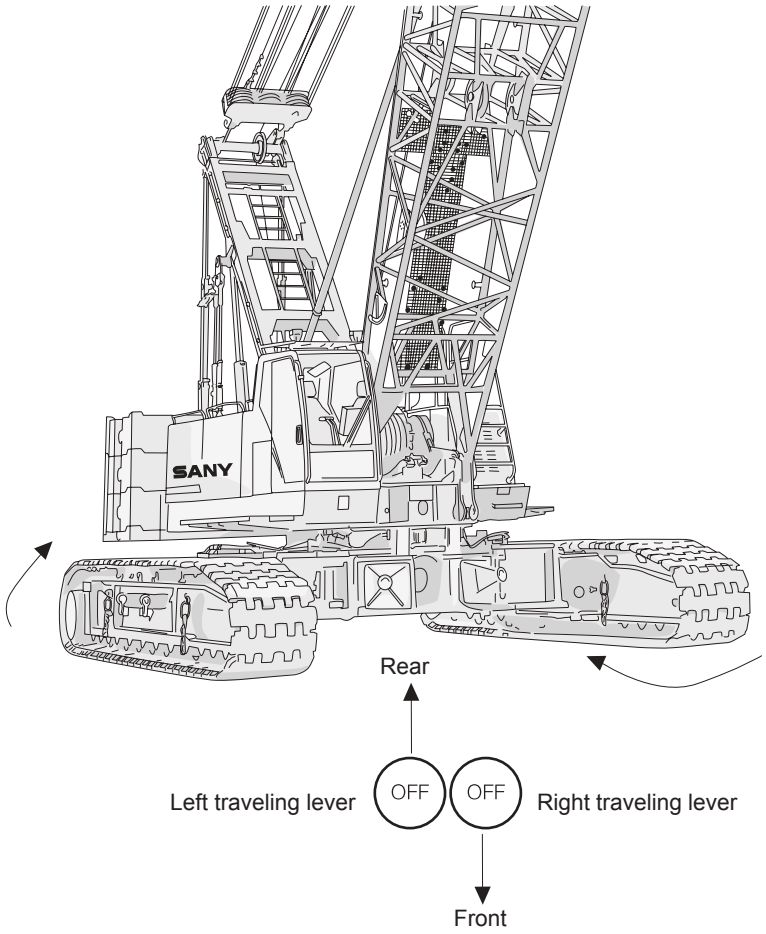
-- For a large radius left turn (see Fig. T103 6009), push the two traveling levers forward from the mid-position (OFF position), but the right lever should be pushed further than the left one; then the right crawler will move faster than the left crawler.



T103 6009

-- For a large radius right turn, the operations of the left & right traveling levers are opposite to that in the left turning.

-- For a left spot turning (see Fig. T103 6005), push forward right traveling lever from mid-position (OFF position) and pull back left traveling lever from mid-position (OFF position).



T103 6005

-- For a right spot turning, the operations of the left & right handles are opposite to that in the left spot turning.

-- Place the two traveling levers back to mid-position (the OFF position), stop traveling and keep the crane at original state.

⚠ CAUTION

Beware of damage to the brakes!
Move the control levers smoothly and steadily during operation. Move the control levers back to the mid-position rapidly may cause damage to the brakes!

5.3.3 Selection of Traveling Speed

For driving operation, increase the engine power through accelerator switch or pedal. Then operate the left/right traveling levers/pedals, the crane will start to travel. During the crane traveling, adjust the engine power can change the traveling speed. There are two speed ranges available for this crane:

Normal speed: 0~0.68km/h (0~0.42mph) (with a load, on solid and even ground)

High speed: 0~1.0km/h(0~0.62mph) (high-speed travel shift)

High speed shift can only be selected when the crane is with no load or with a light load on good road surface with short boom. When the crane is with a load and the road condition is irregular, or large traction force is required and the boom is long, it should travel at normal speed. High speed and normal travel shift can be switched only when the crawlers are at standstill, and the shift can be carried out through setting the Move rotary switch at the needed position. The traveling speed can also be adjusted through the “Hoist/Move” switch at the left control panel. Set the “Hoist/Move” switch at the “Slow” position to carry out some micro-movement traveling operation; set the “Hoist/Move” switch at the “Normal” position to drive the crane at normal speed.

⚠ CAUTION

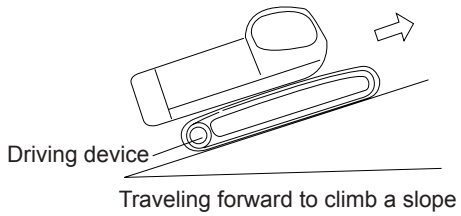
-- Pay attention to the follow issues when select the traveling speed:
The crane can travel within two speed ranges. However, the traveling speed is affected by the load attached and road condition. When making turns, travels on difficult terrains, slops, or with a load, the crane must travel at low speed.
-- Select the corresponding function according to the actual configuration of the crane.

5.3.4 Traveling on Slopes without Load

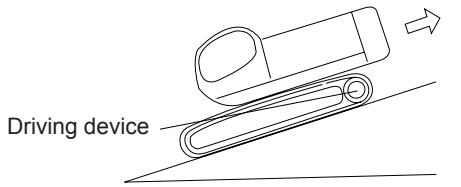
The gradeability of the SCC1000C crawler crane is 30%, that is, the crane can climb up to a slope of 16.7°with the 18m(59'1") basic boom and without load.

If the crane travels with the basic boom, the boom angle shall be kept smaller than 30°.

When traveling forward to climb a slope, the driving wheels shall be at rear; vice versa, when traveling backward to climb a slope, the driving wheels shall be at front. The maximum slope for crane climbing is16.7°, see Fig. T253 6009.



Traveling forward to climb a slope

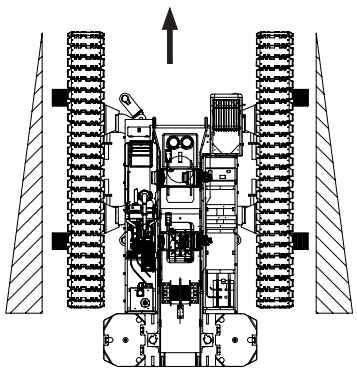


Traveling backward to climb a slope

T253 6009

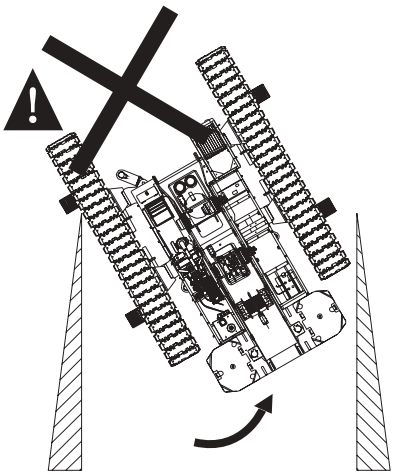
To prevent damage to crawler group, the following regulations must be observed when driving the crane on ramps or slopes:

-- Usually, the crane is only allowed to travel straight-line on the ramp, see Fig. T253 6010.



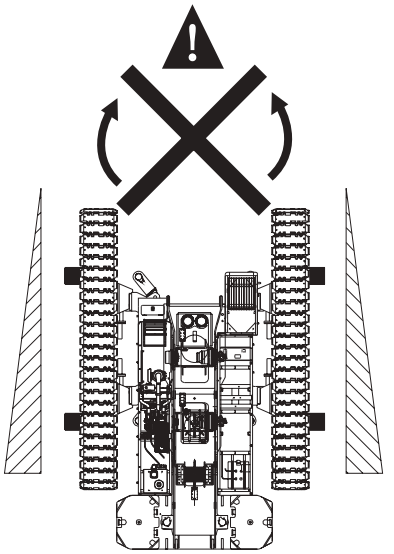
T253 6010

-- It is forbidden to drive on or off the ramp at an angle, see Fig. T253 6011.
-- Surface of the ramp must be even, and the maximum cross gradient must not exceed 1%.



T253 6011

-- It is forbidden to change direction when drive on or off the ramp, see Fig. T253 6012.



T253 6012

⚠ CAUTION

Avoid sudden violent startup or turning during traveling. It is forbidden to lift or lower load during traveling.

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6 Slewing Operation

6.1 Overview

-- Slewing: Pinions of the slewing reducer mesh with the slewing ring exteriorly. The slewing pinions are driven by a rated motor. The two slewing pinions drive the external teeth of the slewing ring to rotate.

--Braking: Normally closed, spring-loaded, blade-type brake, spring-applied and hydraulically released.

--Slewing lockup: Electronically controlled hydraulic cylinder lockup device.

--Free slipping: When the center of gravity of the load and that of the boom are not in a same plane due to mis-judging, the function of free slipping will rectify the upperworks to prevent the load from wiggling.

--Slewing speed: 0~2r/min (no load)

The owner/user of the crane shall be responsible to make sure that the ground is of sufficient load-bearing capacity to support the load. Special steel plates or wood shim blockings may be required to underlay the crawlers to disperse the load.

⚠ CAUTION

After completion of the work or during transportation, it is required to set the "Swing " switch at the "Lock" position.

⚠ WARNING

-- Danger of over-turn!
-- There is a danger posed by the moving crane!
-- It is prohibited to carry people by slewing the platform or the load handling device.
• Before the slewing operation, sound the horn to warn people around to leave the slewing radius;
• Make sure that there is no person or obstacle within the slewing radius or at the rear of the crane.
• Rotation of the upperworks might crush or squeeze people on the lowerworks' stair.

6.2 Slewing Operation

6.2.1 Slewing Braking

1. Pull down the “Function locking lever” at the right of the seat after the engine is started. Then set the “Swing” switch on left panel at “Unlock” position to prepare for the slewing operation;

⚠ CAUTION

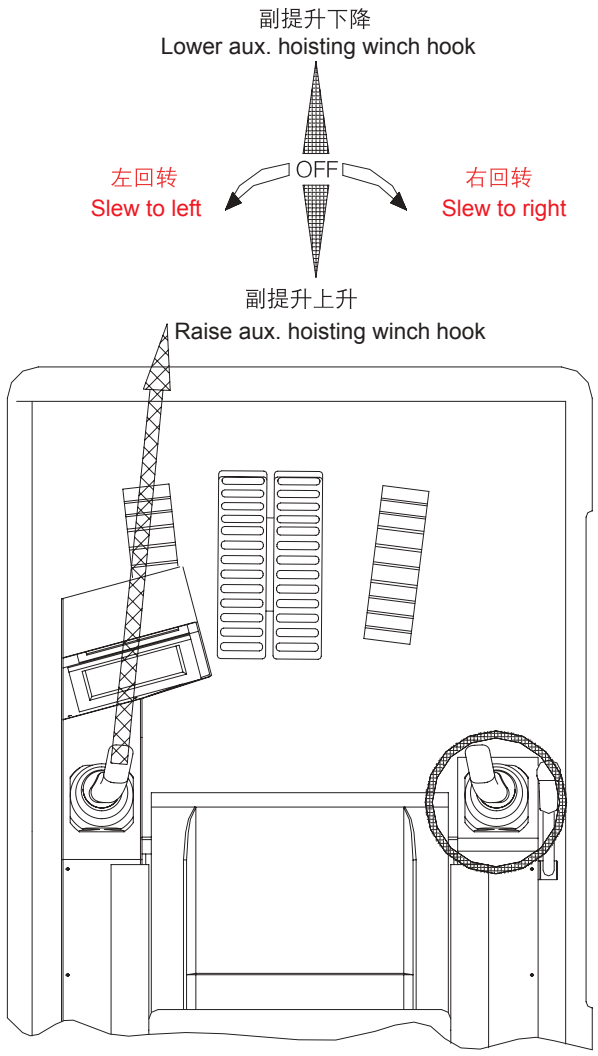
Beware of damage to the slewing lockup device!
-- Before slewing at full power, it is required to slew the crane slightly in a random direction to ensure that the slewing lockup device is not engaged.
-- Slewing can only be locked up when the crane is at a standstill. Then set the “Swing” at the “Lock” position.
-- The slewing lockup device cannot be connected during the operation of slewing to prevent damage to the locking pins.

2. Press the “Swing brake/Relief” button on left control lever to release the slewing brake.
3. Raise the engine power by adjusting the accelerator switch or pedal.
4. Set the “Swing” button on left control at “Normal” position (The “Slow” position is for the slewing micro-motion mode, at which time the slewing speed is low), and the crane is ready to rotate.

⚠ WARNING

-- Danger of crushing or impact!
-- There is a danger within the slewing radius!
It should be noted that the upperworks may slew automatically in the following situations after the slewing brake is released:
• The crane is on a slope.
• There is wind.

5. Push the left control lever from mid-position to left can rotate the upperworks to left; vice versa, push to right can rotate the upperworks to right, see Fig. T103 2005.



T103 2005

⚠ CAUTION

Beware of damage to the brakes!
Move the control levers smoothly and steadily during operation. Move the control levers back to the mid-position rapidly may cause damage to the brakes!

6. At the beginning of slewing, it is required to raise the speed steadily. Pull the lever continually to adjust to the required speed.
7. Releasing the control lever to the mid-position (OFF position) can stop the crane slewing. The slewing speed will then reduce to stop gradually and the upperworks will stop rotating. If it is required to stop quickly, the control lever can be pushed slightly exceeding the mid-position (OFF position) and then slightly to the opposite direction.

⚠ CAUTION

Beware of damage to the boom frame and slewing driving system!

⚠ WARNING

Do not engage the slewing brake during slewing; otherwise, the brake can cause the upperworks to stop slewing suddenly. As a result, the boom frame may be damaged due to unsymmetrical load, or the slewing driving system may be damaged due to impact load. Slewing of upperworks should be stopped gradually by operating the slewing control lever.

⚠ CAUTION

Avoid damage to slewing motor or reducer!and is right below boom top.
Do not engage the slewing brake until the upperworks stop slewing completely. Or damage to slewing motor or reducer will result.

8. When the upperworks stops rotating, press the “Slewing brake/Relief” button on left control lever to apply the slewing brake (refer to 2.2.4.1 in section 2 Operator’s Cab).

⚠ CAUTION

-- Before carrying out the slewing operation, ensure that the load is suspended freely and is right below boom top.
-- Actions of slewing operation must be slow so as to avoid violent impact caused by quick slewing and sudden braking.
-- It is forbidden to use slewing brake to stop the slewing operation.
-- If the operation site is inclined, or there is strong wind, or the crane has been out of use for a long period of time, or the crane is during transportation, the “Slewing brake/Relief” button must be pressed to engage the crane slewing brake and set the “Swing ” switch at “Lock” position at the same time.
-- It is forbidden to drag the load or other objects by slewing the crane.

6.2.2 Free Slipping

-- Free slipping

Set the left control lever at the mid-position, and then the upperworks can slip freely according to the load weight or self-weight.

2. Free slipping phenomenon

When the center of gravity of the load and that of the boom are not in a same plane due to mis-judging, the function of free slipping will rectify the upperworks to prevent the load from wiggling.

3. Free slipping operation

Mode of free slipping: damped free slipping.

The “Slewing brake/Relief” button on the left control lever can control the free-slipping. If the “Swing” on the left panel has been set at the “Unlock” position, press the “Slewing brake/Relief” button once and the slewing brake is released, at which time free slipping is allowable. Press the “Slewing brake/Relief” button for a second time, the slewing brake is applied and free slipping is not allowed.

⚠ CAUTION

This crane is equipped with the free-slipping function.

⚠ CAUTION

When apply the “Slewing brake/Relief” button, the upperworks must be in a standstill. Otherwise, the brake might be damaged.

6.2.3 Slewing micro-motion

Slewing micro-motion means that when the slewing pump displacement is low, the slewing speed will also be slowed down even if the control lever is operated in a normal way. The relatively low slewing speed can moderate the moving speed of the load, reduce the impact load, and improve operation accuracy when inching operation is required.

Set the “Swing” switch on the left control panel at the “Slow” position, and the crane is in slewing micro-motion mode. While set the “Swing” switch at the “Normal” position and the slewing speed returns normal.

⚠ CAUTION

Please select the corresponding buttons and functions according to the actual configuration of the crane

□7.1B Main Hoisting – Normal Winch

Same to the auxiliary winch device, detailed information on auxiliary winch please refer to 7.2 Auxiliary Hoisting.

7.2 Auxiliary Hoisting

7.2.1 Overview

-- The aux. hoisting winch is directly driven by the variable hydraulic motor through speed reducer.

-- Speed adjusting principle of the variable motor: Control the hydraulic pressure of the motor through changing the handle deflection angle, and hence the displacement is changed.

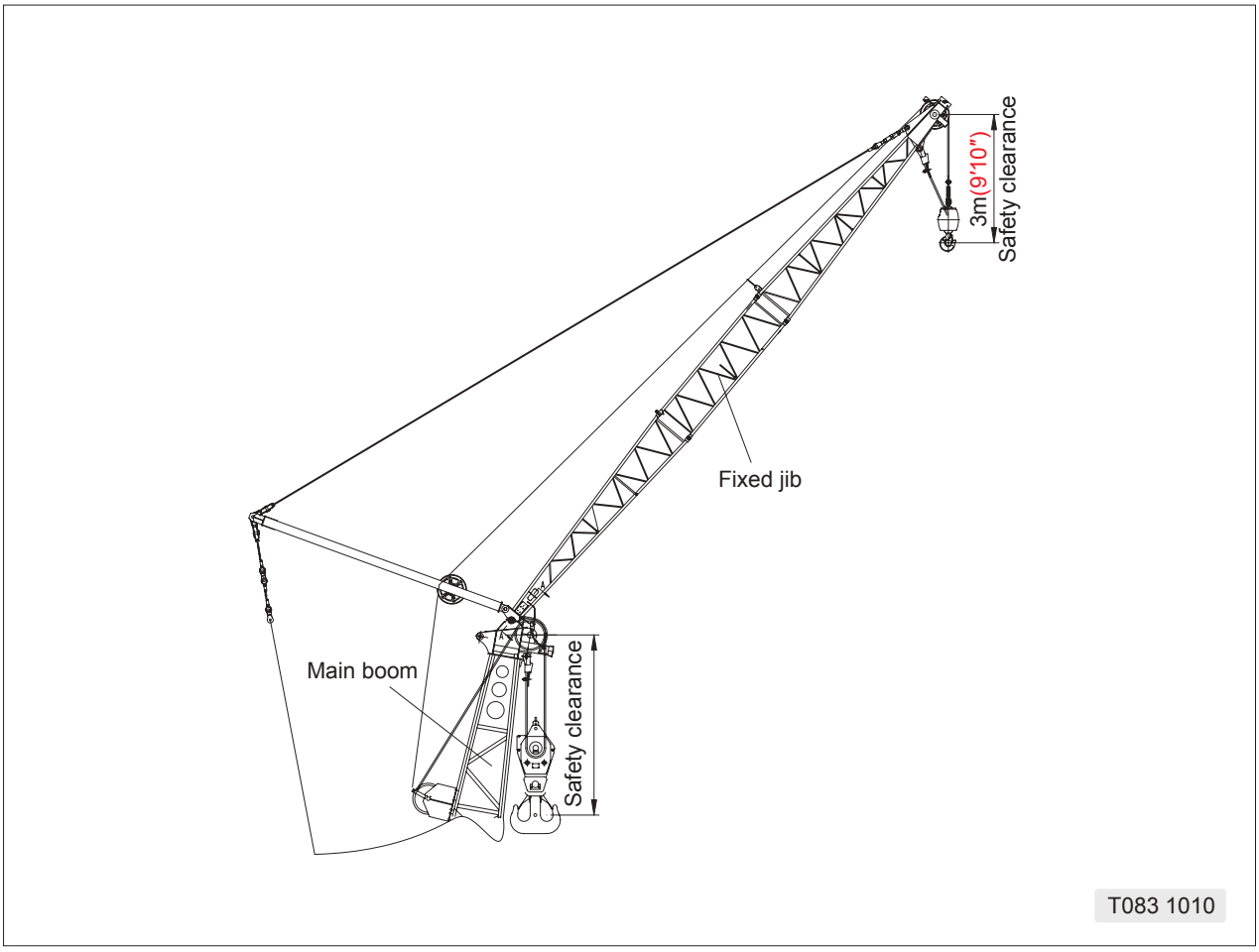
-- When the pressure at the motor high-pressure port reaches the set value, the hydraulic motor will return to the large displacement shift automatically.

-- Normally closed, built-in, wet-type, requiring no adjustment spring-loaded, blade-type brake, spring-applied and hydraulically released.

7.2.2 Preparation before operation

-- Before the hoisting operation, follow the rated load weight stipulated in the Load Charts provided by the manufacturer and follow the methods and procedures described in this manual.

-- The condition that the clearance from the hook block to the boom head is less than 3m(9'10") is called hook block over-hoist (see Fig. T083 1010). Hook block over-hoist can cause the wire rope to break, or the boom/jib retroversion, or damage to boom head. The hook block must keep a required clearance from the boom head. The hoisting wire rope must be unwound accordingly when lowering the boom/jib.



-- Control the raising or lowering speed through the travel of control levers.
-- Set the “Aux. hoist” switch on right panel at the “Unlock” position.

⚠ WARNING

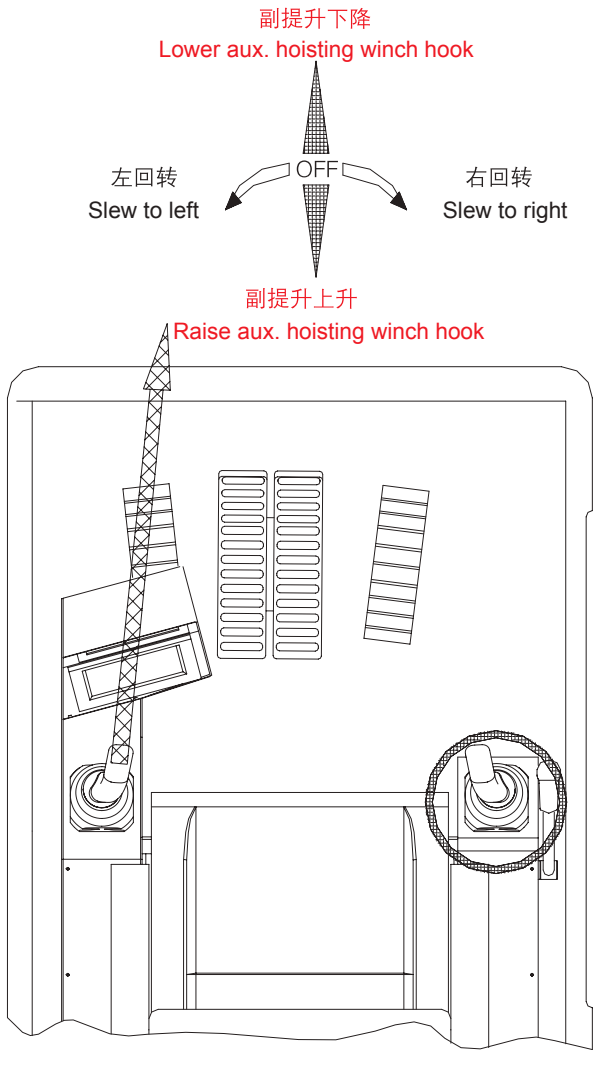
Danger of load falling!

7.2.3 Auxiliary hoisting winch operating

-- When operating the aux. hoisting winch, make sure that there is no obstacle or people within the boom working space and range. Sound the horn to warn people around to leave the working range area so as to avoid a danger.

-- Raise the engine power through adjusting the accelerator switch or pedal to increase the operating speed of aux. hoisting winch.

-- As shown in Fig T103 2005, pulling the control lever from mid-position (OFF position) will lift the load; while pushing the control lever forward from mid-position (OFF position) will lower the load. The further the lever travels from the OFF position, the higher the speed will be.



T103 2005

⚠ CAUTION

-- This crane is equipped with an over-hoist limit device. When the over-hoist limit switch is actuated during the lifting operation of the aux. hoisting winch, the lifting operation will be stopped. In addition, the auxiliary hoisting winch drum is also equipped with a 3-wrap protection device, which will stop lowering the hook block when there are only three wraps left on the winch drum.
-- The over-hoist and the over roll-out limit switches can only function in the normal working mode. When the "Limit" switch on the control panel is set at the "Relief" position, both of the limit switches are out of commission. Pay more attention to operation at this point in time.

-- When the load is approaching the expected position, move the control lever gradually to mid-position (OFF position) and decrease the load moving speed. Then release the control lever to the mid-position (OFF position) to keep the load at the original position (winch brake will be engaged).

⚠ CAUTION

**Beware of damage to the brakes!
Move the control levers smoothly and steadily during operation. Move the control levers back to the mid-position rapidly may cause damage to the brakes!**

-- When the "Aux. winch" rotary switch on right control panel is set at "Lock" position, the auxiliary hoisting winch locked to keep the load at the original position. At this point in time the engine can be stop.

⚠ WARNING

**-- Operate steadily! The lifting or lowering must be slow so as to avoid impact.
-- Beware of damage to the crane!**

7.2.4 Operating micro-motion

Operating micro-motion means that when the pump displacement is low, the hoisting speed will also be slowed down even if the right control lever is operated in a normal way. The relatively low hoisting speed can moderate the lifting or lowering speed of the load, reduce the impact load, and improve operation accuracy when inching operation is required.

Set the “Hoist/Move” switch on the left control panel at the “Slow” position, and the crane is in hoisting micro-motion mode. While set the “Swing” switch at the “Normal” position and the hoisting speed returns normal.

⚠ CAUTION

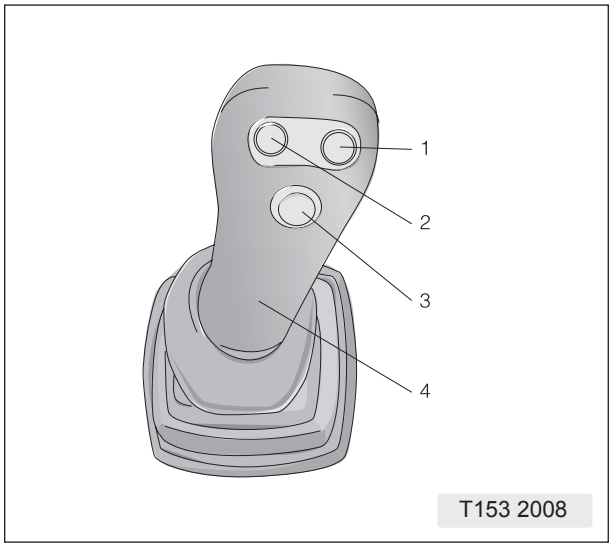
-- This function is exclusive to the Rexroth hydraulic system.
-- Please choose the appropriate switch and corresponding functions according to the actual configuration of the crane.

7.2.5 Converging flow

The crane is equipped with auxiliary hoisting winch converging flow function, which can accelerate the lifting and lowering of the auxiliary hoisting hook. The operation is achieved by the button switches (normally open) at the left control lever (see Fig. T153 2008). Press the “Converging flow” button to activate the converging flow function when lifting and lowering the hook block. The function cannot be achieved when the button is loosened.

⚠ CAUTION

This function is exclusive to the Rexroth hydraulic system.
Please choose the corresponding function according to the actual configuration.



Left Control Lever

Table 2-17 Functions of Buttons on the Left Control Lever

No.	Name	Function
1	Slewing brakerelief	Auto-reset button. Press once, the slewing brake is released and can slew. Press for a second time, the slewing brake is engaged and can not slew.
2	Converging flow	It can converge flows to improve the speed of boom luffing, main and aux. hoisting.
3	Horn	Press this button to sound the horn, and the horn will sound automatically when over loading.
4	Left control lever	Controlling the aux. hoisting winch and slewing operation.

⚠ CAUTION

The converging flow function is available to improve the speed of auxiliary hoisting hook during lifting and lowering operation of auxiliary winch.

8 Luffing Operation

8.1 Overview

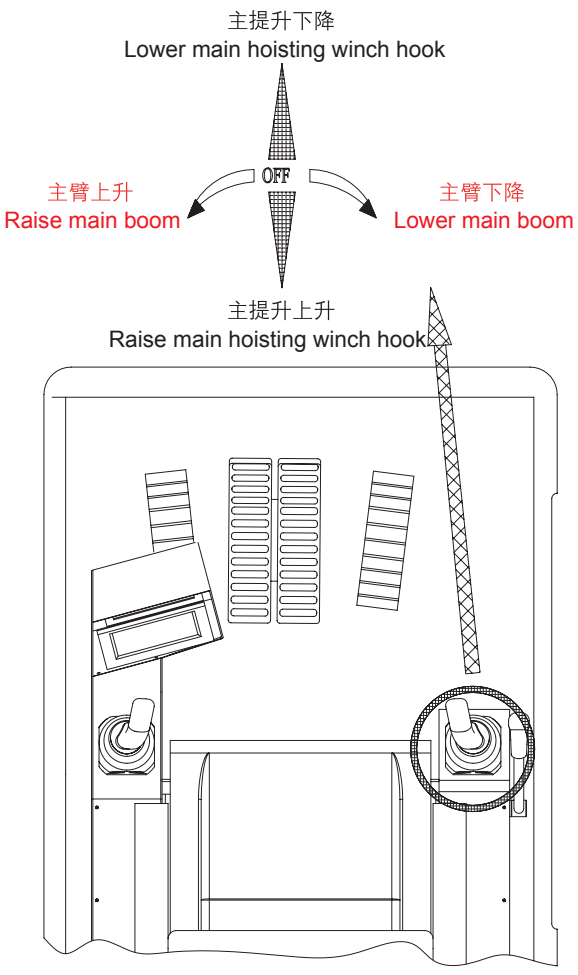
-- The boom luffing winch is directly driven by the hydraulic motor through planetary gears.
-- The boom luffing winch is equipped with pawl and ratchet device to ensure the safety of boom under non-working condition.
-- Normally closed, built-in, wet-type, requiring no adjustment spring-loaded, blade-type brake, spring-applied and hydraulically released.

8.2 Preparation before operation

-- Check all the operation of each safety device for normal function.
-- The pawl and ratchet device for boom luffing winch is electrically controlled. Set the “Luffing” switch on the right control panel at the “Unlock” position to release the pawl and ratchet locking. If the switch is set at the “Lock” position, the pawl and ratchet device is engaged. If the pawl and ratchet is stuck and cannot be released, move the control lever slightly to operate the boom luffing winch to lift, and the ratchet can be released.
-- The clearance from the hook block to the boom head must keep more than 3m(9'10"). The hoisting wire rope must be unwound accordingly when lowering the boom/jib. If the hook block comes into contact with the boom head, it can cause the wire rope to break, or the boom/jib retroversion, or damage to boom head.
-- Control the raising or lowering speed of boom luffing through the travel of control levers according to the operating condition on the job location.

8.3 Operating at normal speed

-- When operating the boom luffing winch, make sure that there is no obstacle or people within the boom working space and range. Sound the horn to warn people around to leave the working range area so as to avoid a danger.
-- Change the engine power through adjusting the accelerator switch or pedal to regulate the main boom raising/lowering speed.
-- Pulling the control lever from mid-position (OFF position) will raise the main boom; while pushing the control lever forward from mid-position (OFF position) will lower the main boom. The further the lever from the mid-position (OFF position), the higher the speed will be (see Fig. T103 2003).
Raise boom: pulling the control lever backward, i.e. increasing the boom angle.
Lower boom: pushing the control lever forward, i.e. reducing the boom angle.
Stop luffing: when the control lever is at the mid-position, the winch stops acting and the automatic hydraulic brake will be engaged.



T103 2003

-- When the boom is approaching the expected position, move the control lever gradually to the mid-position (OFF position) and decrease the boom moving speed. Then release the control lever to the mid-position (OFF position), at which time the hydraulic winch brake will stop the boom movement and keep it at the original place.

-- After the operation completion, if the boom angle stays for a long period of time, set the “Luffing” switch on the right control panel at the “Locking” position. Then the luffing winch is locked and the engine can be switched off.

⚠ CAUTION

Boom luffing speed is related to the travel of control lever away from the mid-position (OFF position), i.e. the further the lever travels, the higher the speed is.

⚠ CAUTION

-- Beware of damage to the brakes!
-- Move the control levers smoothly and steadily during operation. Move the control levers back to the mid-position rapidly may cause damage to the brakes!

⚠ WARNING

Operate steadily! Never engage the pawl and ratchet locking during lowering the boom. Otherwise, it may cause serious consequences.

⚠ CAUTION

-- Luffing operation can not be carried out suddenly or quickly! The starting and stopping of boom luffing control lever must be slow so as to avoid impact inertia.
-- If the crane is to be out of use for a long period of time, please check whether the pawl is at position and whether they can stick the ratchet.
-- Unwind the hoisting wire rope when lowering boom/jib. If this point is not followed, the load may come into contact with the pulley at boom or jib end, which can cause the wire rope or other component to break and hence the load may fall off.

⚠ WARNING

Danger of colliding or damage of structural component!

8.4 Operating micro-motion

Operating micro-motion means that when the pump displacement is low, the luffing speed will also be slowed down even if the right control lever is operated in a normal way. The relatively low luffing speed can moderate the luffing speed of the load, reduce the impact load, and improve operation accuracy when inching operation is required.
Set the “Hoist/Move” switch on the left control panel at the “Slow” position, and the crane is in luffing micro-motion mode. While set the “Swing” switch at the “Normal” position and the luffing speed returns normal.

⚠ CAUTION

-- This function is exclusive to the Rexroth hydraulic system.
-- Please choose the appropriate switch and corresponding functions according to the actual configuration of the crane.

8.5 Safety control

The electric control system is strictly set to avoid dangers caused by over-operation and ensure the safety of the crane.

-- When the boom reach the limit positions of boom upper limit switch, jib upper limit switch, or boom back-stop limit switch, raising the boom will be automatically stopped.

-- When the boom reach the limit positions of boom lower limit switch and jib lower limit witch, lowering the boom will be automatically stopped.

⚠ CAUTION

Limit relief can only be applied in the event of crane assembling or of a special case. As there still exist potential safety hazards, please be cautious when operate in such a case.

9 Operation of Hoisting Equipment

⚠ CAUTION

The “Working mode” switch must be set at the “Working” position.

9.1 Single Actions

-- Main hoisting
-- Auxiliary hoisting
-- Boom luffing
-- Left crawler traveling (using one pump together with main luffing winch and auxiliary hoisting winch, with high/low speed ranges)
-- Right crawler traveling (using one pump together with main hoisting winch, with high/low speed ranges)
-- Slewing

9.2 Compound Actions

-- Compound actions
• Main hoisting + Boom luffing
• Auxiliary hoisting + Boom luffing
• Main hoisting + Auxiliary hoisting
• Crawler traveling + Slewing

⚠ CAUTION

-- The slewing combined action is only allowable under following conditions:
• the crane is traveling with no load.
• the slewing can be driven independently.
-- Compound actions indicate that several actions can be carried out at the same time, during which time great care should be taken to prevent dangers of overturn. Some of the compound actions are only allowable when the crane is carrying light load or traveling at low speed.

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10 Assistant Action

⚠ CAUTION

The “Working mode” switch must be set at the “Assembling” position.

The following actions can be achieved through the corresponding telecontrol box under the assembling mode. If the assembling inconvenience brought by correlative limit function, set the “Limit” switch at “Relief” position to release from limit. Compound actions are not allowable under the assembling mode. Instead, only the following single actions are allowable:

- A-frame erecting cylinders
- Crawler telescopic cylinders
- Lowerworks outrigger cylinders

⚠ CAUTION

-- Compound actions are not allowable under the assembling mode.
-- When the switch is set at the “Assembling” position, the assembly/ disassembly operations are allowable. When the switch is set at the “Working” position, the operations of slewing, traveling, hoisting and luffing are allowable.
-- The A-Frame erecting cylinders can only be operated under the “Assembling” mode.
-- When the switch is set at the “Assembling” position, all the safety device are out of commission, but over-hoisting limit switch, over roll-out limit switch and the hoisting boom upper limit switch. Be careful in operating during assembling, beware of accident.
-- In the assembling mode, the operation can only be carried out during day as there is bright light, and an on-site supervisor should also be employed. Otherwise, there exist potential hazards.

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11 Operating Instruction

11.1 Overview

The load regulated in Load Charts applies to the following situations:
-- The crane is on level ground (1%) with load when not traveling.
-- The ground is of sufficient load bearing capacity.
-- All crane actions should be carried out slowly and steadily in line with its configuration and the load attached. Sudden acceleration is not allowed.
-- Weight of the hook block, wire rope from hook block to boom/jib head, and hoisting tools are also included in the rated load, which should be deducted by value in Load Charts to get the net load capacity.

Table 2-25 Dead-weight of hook block

Nominal Load (t)(UST)	100(110)	50(55)	25(27.5)	9(10)
Dead-weight (kg)(lb)	1600(3527)	900(1984)	550(1213)	250(552)

-- Be careful in slewing and engaging the slewing brake, especially when the crane is installed with a jib.
-- Slewing as slow as possible. Pay special attention when engaging the brake.
-- It is not allowed to use boom and jib to hoist the load at the same time (dual hook operation)!

⚠ WARNING

Dragging the load or increasing working radius is absolutely not allowed!

11.2 Precautions

⚠ WARNING

-- Please read Load Charts carefully! It is not allowed to operate the crane without reading and understanding the Operating Instructions and Load Charts.
-- The wire ropes must be reeved as described; otherwise, the wire ropes or winches might be damaged.

If not otherwise described in the Load Charts, all crane operations with load shall be implemented on level and solid ground with sufficient load bearing capacity and the gradient less than 1%; otherwise, the crane may turn over.
If the wind speed exceeds the limits given in section “11.3 Influence of Wind Speeds” of this chapter, no operation shall be done to the crane.

⚠ CAUTION

-- Lifting load in a way disobeying the requirements in Load Charts may cause the boom/jib to roll over or to be damaged.
-- Overload is strictly prohibited!
-- Dragging the load is strictly prohibited!

Before commencing the operation, all the limit switches and safety devices must be set at the working state.

⚠ CAUTION

Carry out the required checks before commencing the operation.

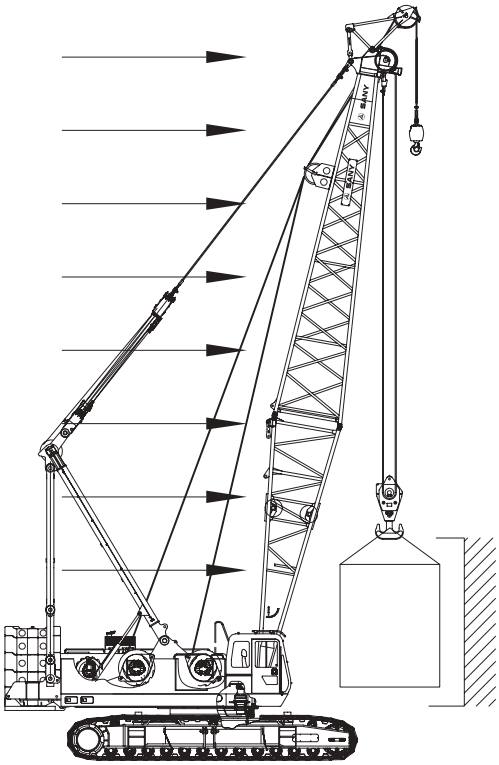
-- Beware of damage to people in the operation area! Sound the horn to warn people around before commencing the operation.
-- Beware of damage to the crane!

11.3 Influence of Wind Speeds

1. Overview of wind influence

-Wind has an adverse influence on the crane's hoisting capacity and stability, as shown in Fig. T153 1072 and Fig. T153 1073. Even if the load is within the hoisting capacity of the crane, influence of the wind may also cause the suspended load or the crane out of control.

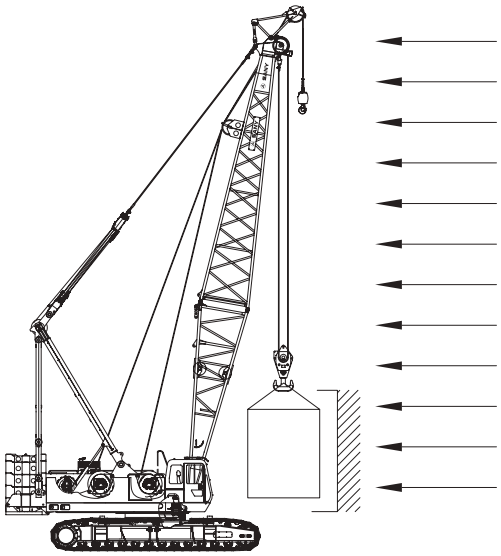
Forward stability is affected by the wind from back of the boom. External force imposed on the boom and the load by wind will enlarge the crane's tipping over moment, which functions similarly to increasing load to the hook block.



Impact on back of the load by wind force will increase the operation radius. This situation may cause the crane to tip over. It is required to avoid such dangerous load as much as possible.

T153 1072

Influence of wind in front of the load: In this case, it is very dangerous when the boom is at or close to maximum boom angle.



Wind in front of the boom can weaken the boom's normal forward inclination. If neglected, it may cause the crane to tip over or the boom to break.
If the load contacts with the boom, the boom may deform or break.

Q153 1073

• If the wind speed exceeds the allowable value, danger may be caused by static load, by swinging of additional load or by power impact (for example, vibration of the parts of crane caused by wind). Hence, the maximum allowable wind speed shall be taken as the limit value.

⚠ WARNING

-- Danger of crane over-turn!

⚠ CAUTION

Limit value of wind speed refers to the average value of gust within 3 seconds or the maximum value recorded on the anemometer.

• The qualified operator, operation planner or hoisting director must possess required experience and judgement, and can compensate the influence of wind to the load and the boom frame by reducing the rated load capacity of the crane, or by slowing down operation speed, or by using both of the two methods.

⚠ CAUTION

If the above notices are neglected, it may cause the crane to tip over or the boom frame (main boom or jib) to roll over or bend, or even lead to personal injury or death.

-- The crane operator must consult relative authority about the weather before starting the crane and measure the wind speed with the anemometer. When carrying out annual inspection to the crane, it is required to use a rectified anemometer to check the one installed on the crane, at least one time in a year.

-- It should be noted that wind speed at the tip of main boom or jib may be larger than that on the ground. In addition, the larger surface of the load facing the wind, the larger impact the wind will have on the load.

-- As the rule, the rated value and operation speed shall be reduced in the following situations:

⚠ CAUTION

The load is blown to swing forward to a range exceeding the operation radius allowed in the operating condition, or swing sideways to a range exceeding the main boom's hinge point on that side.

-- Limit on crane stability and intension is critical, meanwhile, wind direction is equally important. If some crane components vibrate by influence of strong wind, inspection work shall be carried out by manufacturer of the crane.

Note: As for situation influenced by wind not addressed in this section, please contact the technical service department of the manufacturer.

2. Wind speed and wind pressure to a crane with load

For the SCC1000C crawler crane, maximum wind speed allowed is 16m/s(35.8mph) (equivalent to 160N/m^2(0.023psi)dynamic pressures). When the wind speed reached the limit, the crane should stop working. The max. wind speed and pressure allowed refer to the following table.

Table 2-26 The max. allowed wind speed and pressure in H operating condition

Length of main boom(m)(ft)	Allowed wind speed(m/s)(mph)	Allowed pressure (N/m^2)(psi)
Less than 36(Less than 118'1")	16.0(35.8)	160(0.023)
39~66(127'11"~216'6")	13.8(30.9)	120(0.017)
69~72(226'5"~236'3")	11.3(25.3)	80(0.012)

Table 2-27 The max. allowed wind speed and pressure in FJ operating condition

Length of main boom / jib (m)(ft)	Allowed wind speed(m/s)(mph)	Allowed pressure (N/m^2)(psi)
Less than 48/ less than 25 (Less than 157'6")/ (Less than 82') (including 25m) (including 82')	13.8 (30.9)	120 (0.017)
51~63/ Less than 25 (167'4"~206'8")/ (Less than 82') (including 25m) (including 82')	10.6 (23.7)	70 (0.01)

11.4 Parking the Crane

1. Requirements for Ground Surface

-- Before starting the crane, make sure that the ground is of sufficient bearing capacity. For parking a crawler crane, the ground must be level and solid.

-- Before starting the crane, the following visual inspection shall be used to check whether the level has been rectified.

Visual inspection:

Have the hook block swing freely like a pendulum. After the crane is parked properly, let the hook block stay at the center of the boom and look from the front of the crane.

• If a short main boom (less than 42m (137'10")) is installed, take the system center as the reference center and there should be no difference between left and right (which means the difference is less than 0.1m(3-15/16")).

• If a long main boom is installed, the central place shall be taken as the center and the hook is allowed to have a difference equal to half of the boom diameter, including impact by side wind.

• If a difference is found when aligning the hook block, you should use the gradienter at the surface of swing edge to measure the gradient (the gradient should be no greater than ±0.5% (±0.3°)).

2.Boom System

-- Position of boom frame

• When the crane is planned to be out of use and be working station, please pay attention to the maximum wind speed allowed in the current situation.

Table 2-28 In H operation condition

rane model SCC	Crawler width (m)(ft)	Main boom (m) (ft)	Boom angle(°)	The max. allowed wind speed (m/s)(mph)
1000C	0.95(3'1")	The max. length is72(236'3")	78	11.3(25.3)

Table 2-29 In FJ (main boom + jib) operation condition

rane model SCC	Crawler width (m)(ft)	Total length(m)(ft)	Boom angle(°)	Jib offset angle (°)	The max. allowed wind speed (m/s)(mph)
1000C	0.95(3'1")	82(269')	78	15	10.6(23.7)

⚠ CAUTION

If the wind force exceeds the maximum allowed value according to the weather forecast, please lower the boom system in time.

-- When gravity center of the overall crane is close to the slewing center, the crane can keep its maximum stability, no matter that there is wind. Gravity center of the crane can be changed by adjusting the boom angle (consult the factory's technical service department for detailed information).
-- If the crane is planned to be out of use for a long time, ensure that the upperworks and boom frame are kept at proper positions. In case of a storm, the rear of the crane shall face to the storm.
-- When the crane is installed with a jib, the rear of the boom system shall face the storm as much as possible to avoid the impact of side wind on boom system.

Lowering the boom frame

-- If the wind force exceeds the maximum value allowed to park the crane, lay down the boom frame and place it on ground in time.
-- If condition permits, lay down the boom system against the wind (or against the coming wind). Let the boom system face the wind so as to reduce impacts by the wind force when laying the boom system down.
-- The slewing brake and slewing pin must be engaged.
-- Earlier consideration should be taken to reduce wind speed and adjust wind direction. Collect relative information and forecast as early as possible.
-- Lower main boom, frap the main boom luffing pendant cable, tighten boom pendant cable (pendant rob) and make the boom not away from shim blockings to the moment.
-- Boom system must face the wind.

⚠ WARNING

When wind speed exceeds 16.0m/s (35.8mph), please lower the boom system. Pay more attention to wind direction!