TADANO

Service Manual

Service Manual

Circuit Diagrams and Data

Circuit Diagrams and Data

Rough Terrain Crane

GR-700N

Model: GR-700N-1
Serial No.: FE0376–

GR-700N-1_C1-2E

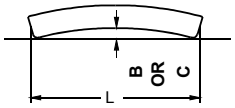
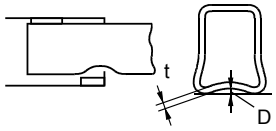
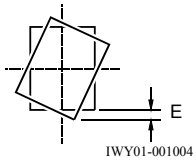
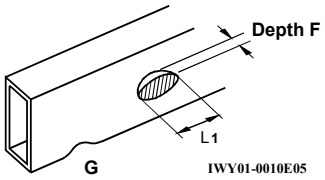
02

Printed in Japan
1506 K

Publication No.: GR-700N-1_C1-2E

5.4 Jib bending and deformation

(1 mm = 3.93701×10^{-2} in)

Item			Standard value (mm)	Remarks
Overall jib bending (at full extension, minimum tilt angle, with rated load)  IWY01-001001			No significant vertical or horizontal bends shall be found along the entire jib length.	Set the machine level. If necessary, adjust the clearance between the jib and the slide plates appropriately.
Bend of individual jib sections (Lengthwise direction)  IWY01-0010E02	Vertical	Jib 1 Jib 2 Jib 3	B ≤ 10 B ≤ 9 B ≤ 9	B ≤ 1.5 × L /1000 L: length of each jib section
	Lateral	Jib 1 Jib 2 Jib 3	C ≤ 7 C ≤ 6 C ≤ 6	C ≤ 1.0 × L /1000
Indentations at jib overlap sections (Bending at jib lower plate)  IWY01-001003		Jib 2 Jib 3	In vertical direction D ≤ 3 D ≤ 2	In vertical direction D ≤ t/2
Check for deformation of side plates.			There must be no large deformation particularly on the lower half surface of side plate where pressure concentrates.	
Check for twisting in the lengthwise direction when jib is fully extended.  IWY01-001004			E ≤ 5	
Check for dents and other localized indentation.  IWY01-0010E05			F ≤ 2 (at $L_1 \geq 50$) Generally dent G on the 4 corners cannot be repaired.	

2.4 Slewing

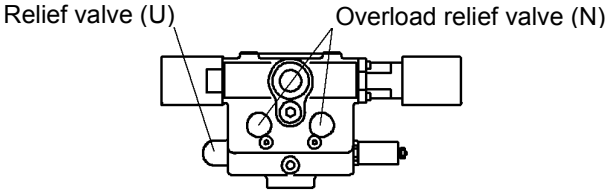
[NOTICE]

◆Oil temperature: 50 ± 5°C (113 - 131°F) (hydraulic oil: TADANO Hydraulic Oil LL)

◆Confirm set pressure on the crane information screen in the maintenance mode of AML.

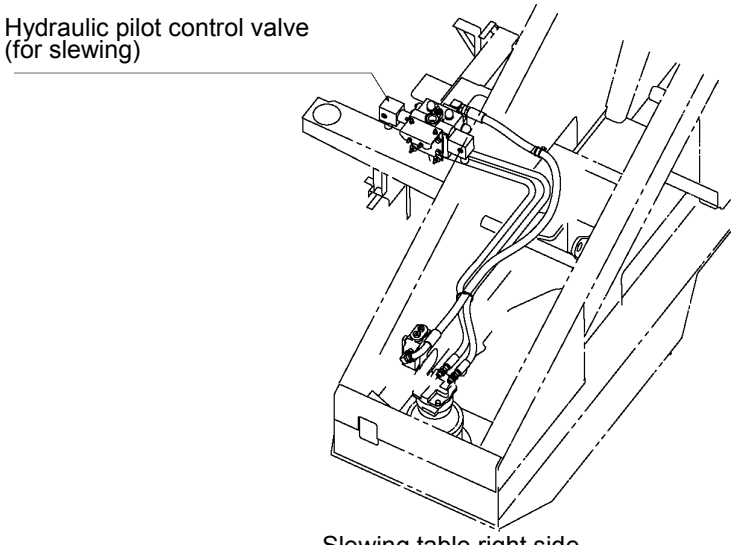
◆Shift the control lever or switch while the engine is idling, then increase engine speed.

Item (Mark)	Set pressure			Engine speed (min^{-1})	Check procedure
	MPa	kgf/cm^2	psi		
Slewing relief valve (U)	20.1±0.5	205±5	2920±70	1550 (MAX.)	1.Turn the PTO switch ON. 2. Apply the slewing lock. 3. Move the slewing lever at its full stroke on the right and left side. 4. In this state, set the engine speed to 1550 min^{-1} and check the pressure.
Slewing overload relief valve (N)	22.6	230	3270	-	Already the pressure is set by the valve manufacturer. (Adjustment is not necessary.)



Hydraulic pilot control valve (for slewing)

IWY02-170008



Slewing table right side

IWY02-172007

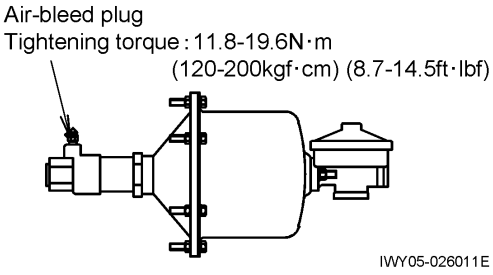
3. Service brake

[NOTICE]

- ◆The vehicle has two boosters; one for the front wheel brakes and the other for the rear wheel brakes.
- ◆Take care of spattering the brake fluid and the fluid level in the fluid reservoir while bleeding.

1. With the sufficient compressed air in the air reservoir, depress the brake pedal and loosen the air-bleed plug on the booster to bleed the circuit.
2. Then tighten the air-bleed plug before releasing the brake pedal.
3. Repeat the above steps until the flowing brake fluid contains no air bubbles. After the air bubbles go out, tighten the air-bleed plug while letting the fluid flow out.

Booster

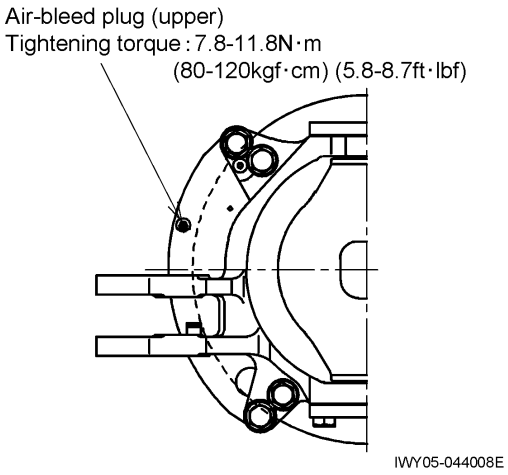


[NOTICE]

- ◆There are two wheel cylinder air-bleed plugs each with each axle.

4. Bleed the wheel cylinders in the calipers of the axles in the steps same as above.

Caliper

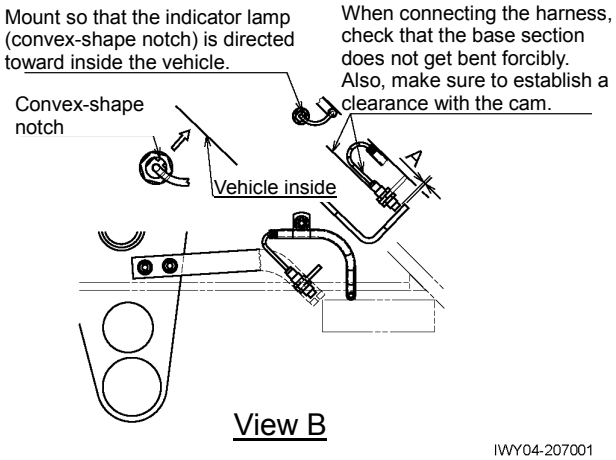


1.8 Straight ahead detection switch (CN408)

1. Apply a thread locking agent (ThreeBond 1401 or the equivalent) to the threaded section of the switch beforehand.
2. Set the rear wheels so that they face straight ahead.
3. Adjust the vertical position of the switch so that the clearance A is 2.5 to 3 mm, and then fix by using the nut. (Tire on-ground state)

• Nut tightening torque:
19 to 20 N-m {193 to 204 kgf-cm} (14 to 14.8 ft-lbf)

4. Check that the green LED lights up when the switch is operated.

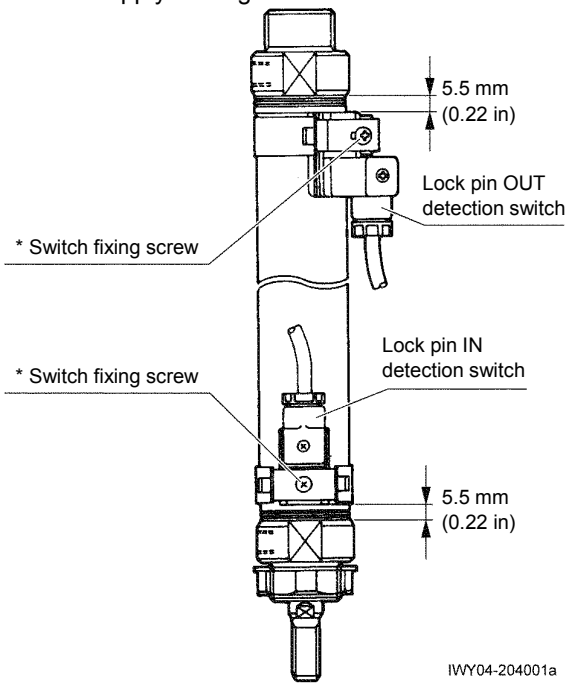


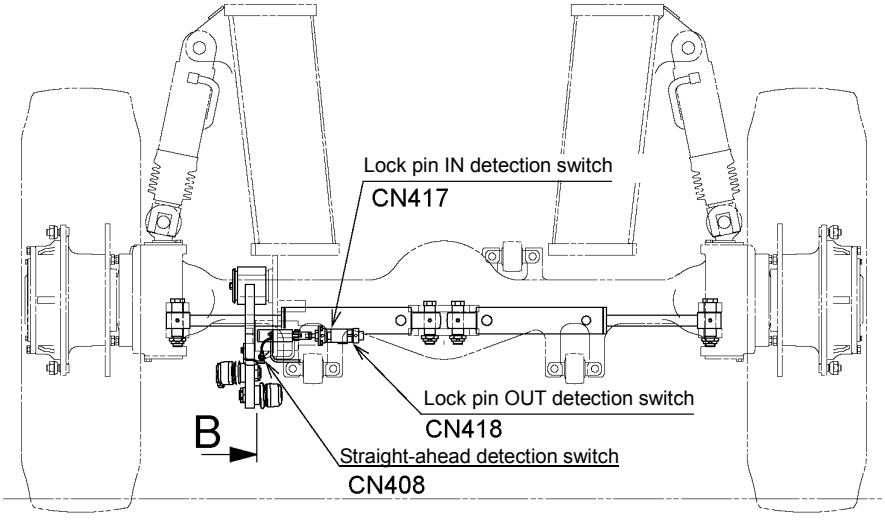
1.9 Rear steering lock pin IN detection switch (CN417)
1.10 Rear steering lock pin OUT detection switch (CN418)

Adjust the vertical position of the lock pin IN detection switch and lock pin OUT detection switch, and fix so that the dimension becomes as described below.

• Switch fixing screw tightening torque
0.5 to 0.7 N-m {5 to 7 kgf-cm} (0.37 to 0.52 ft-lbf)

* Apply locking adhesive.





360-634-30000 ⓪
347-224-33000 ①

2. Boom clearance adjustment

[NOTICE]

- The part numbers and figures in this manual are shown while using the 2nd boom as an example.
- All adjustment procedures are the same from the top to 2nd boom sections (except for the upper part of the boom bottom).
- The term "minimum clearance" means the clearance to which the thinnest provided shim cannot be inserted.
- With the adjustment work, perform the work in a sequential order with the items listed below. (Refer to Figure 1.)

4th - top booms	2nd and 3rd booms
[1]: 2.1 Shim adjustment at lower oblique sides of the boom bottom	[1]: 2.1 Shim adjustment at lower oblique sides of the boom bottom
[2]: 2.3 Shim adjustment at sides of the boom bottom	[5]: 2.2 Shim adjustment at upper part of the boom bottom
[3]: 2.4 Slide plate adjustment at lower part of the boom head	[2]: 2.3 Shim adjustment at sides of the boom bottom
[4]: 2.5 Clearance adjustment at upper part of the boom head	[3]: 2.4 Slide plate adjustment at lower part of the boom head
[5]: 2.6 Shim adjustment at upper part of the boom bottom	[4]: 2.5 Clearance adjustment at upper part of the boom head
[2]: 2.8 Clearance check at sides of the boom bottom	[5]: 2.7 Clearance check at upper part of the boom bottom
	[2]: 2.8 Clearance check at sides of the boom bottom

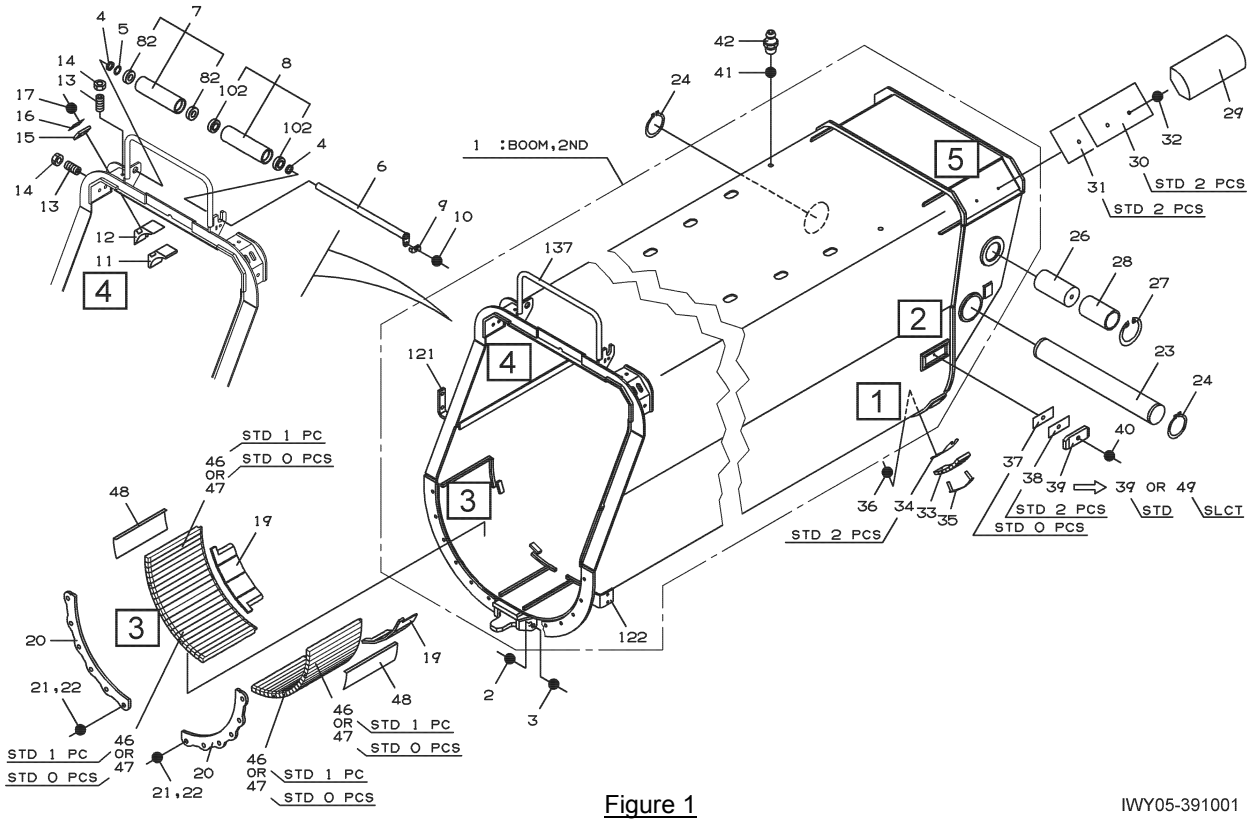


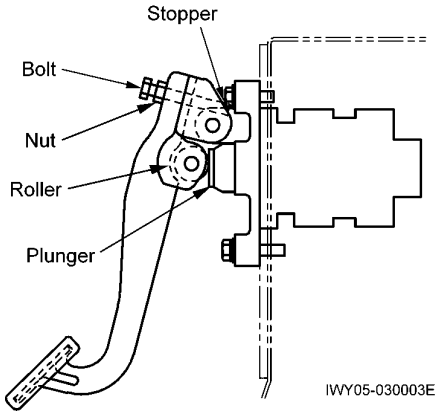
Figure 1
(Example: 2nd boom section)

Y-7 Assembly Adjustment (Traveling Device)

1. Service brake adjustment

1.1 Adjusting the brake pedal

With the pedal weight causing the roller to contact the plunger, adjust the bolt until it contacts the stopper, then use the nut to lock it in place.



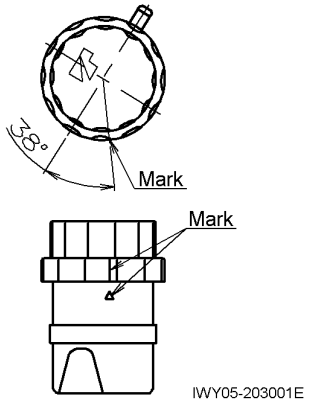
1.2 Tightening the cap of reserve tank of service brake fluid

After bleeding air, pour the brake fluid up to a required level.

[NOTICE]

◆Tightening the cap excessively may break the stopper.

1. Tighten the cap until it stops at the stopper.
2. Check that the position of the tank body and cap is as shown in the figure below.



11. Axle alignment adjustment procedure

(1 mm = 3.93701 × 10^{-2} in)

[NOTICE]

◆This section describes the adjustment procedure performed in the TADANO manufacturing line.

11.1 Align the axle center with frame center

1. Set the centers of 1st through 4th axles as well as the center of steering cylinder mounting pin as the axle center. (Refer to Detail 1.)
   Hang a plumb bob from the axle center, or mount the adjustment jig.
2. Perform the suspension up of vehicle. After a jack up, stop the engine.
3. Set up a string or point with laser at between the punches at the center of outer case bottom surfaces for front and rear outriggers.
   (When the punch does not exist, mark the outer case center by using a punch or others.)
4. Adjust so that the spacing between the string or laser described in 3 and the plumb bob of each axle is set as described below.

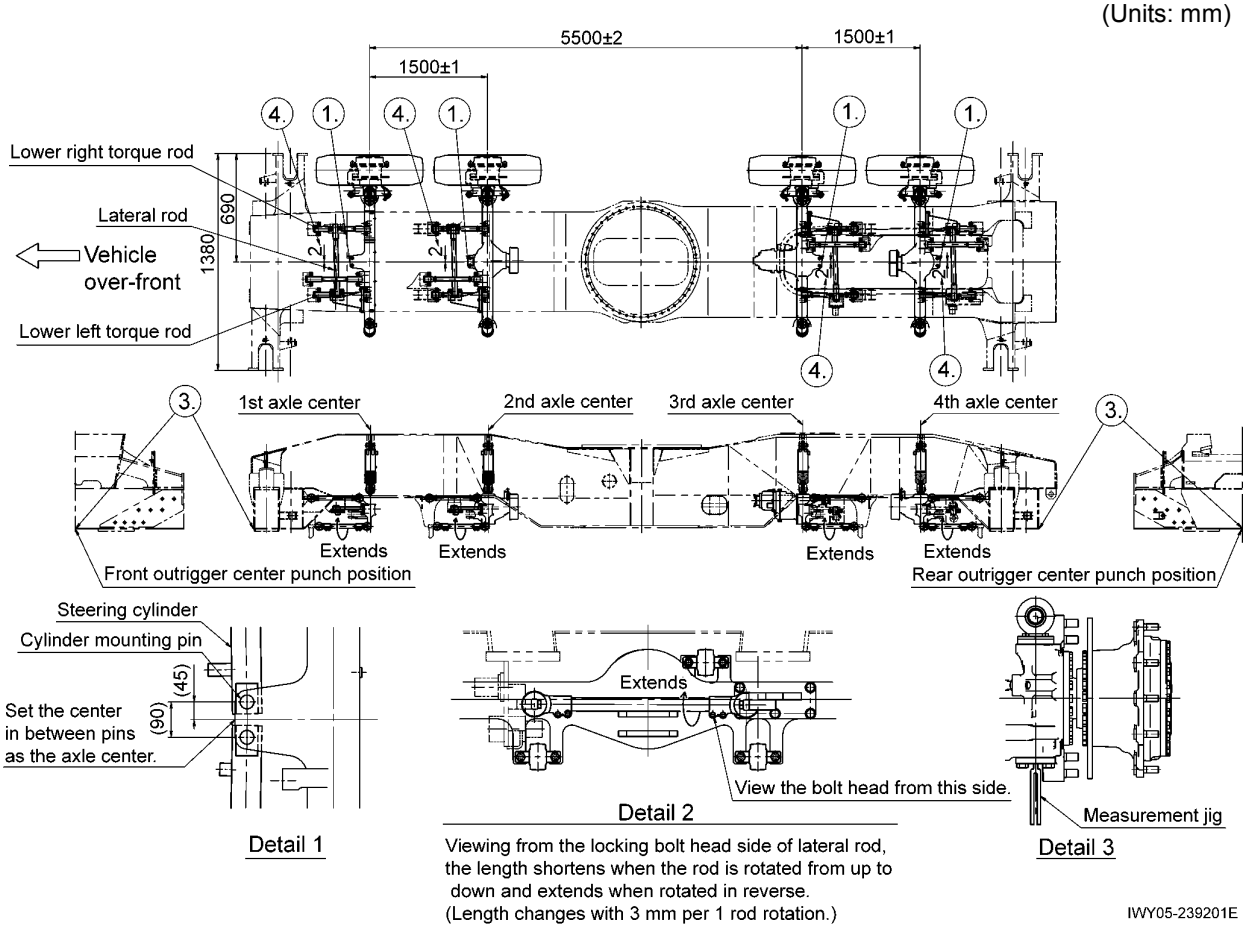
- Center of 1st axle is offset 2 mm to the vehicle right
- Center of 2nd axle is offset 2 mm to the vehicle right
- Center of 3rd axle is offset 2 mm to the vehicle left
- Center of 4th axle is offset 2 mm to the vehicle left

※ Make adjustments by adjusting the lateral rod length. (Refer to Detail 2.)

※ The tightening torque of locking bolts at rod ends shall be 75.5 to 93.2 N-m (7.7 to 9.5 kgf-m).

※ Be careful not look directly at the laser light source.

(Units: mm)



2. Automatic transmission

[NOTICE]

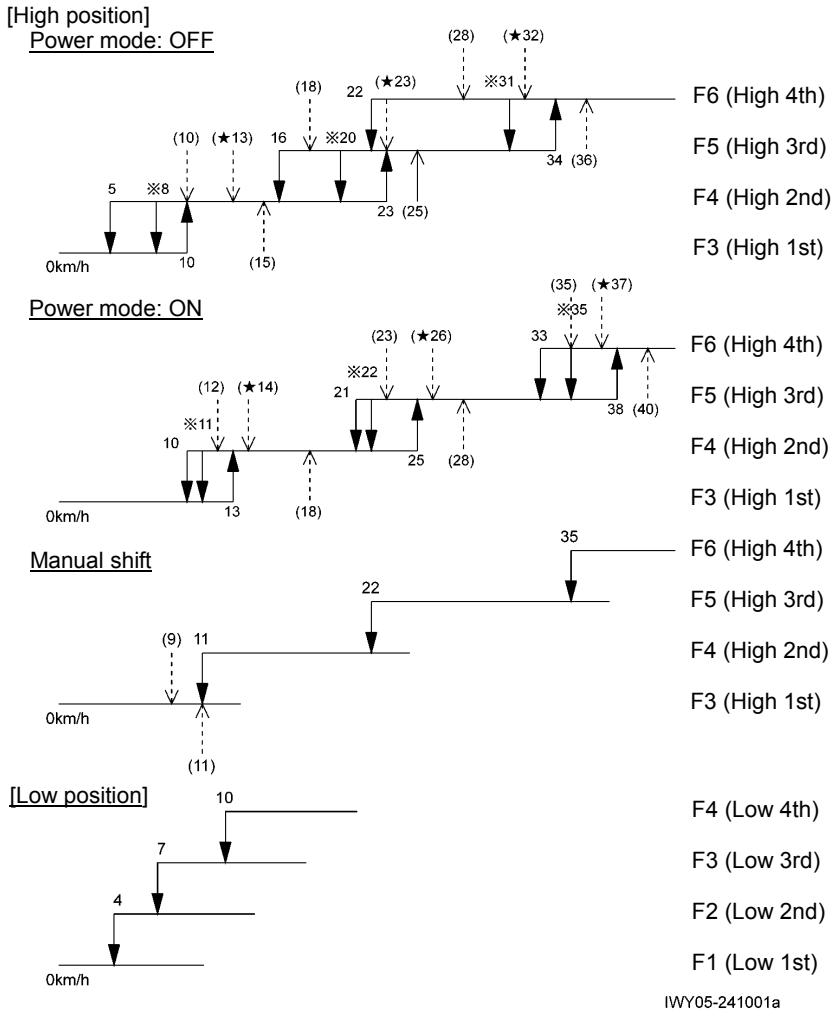
◆Numbers indicate speedometer readings (units: km/h).

◆<- - - ( ) Indicates lock-up ON/OFF point.

◆◄—— ※ Indicates downshift points when the accelerator position is 90% or above.
(These do not need to be checked.)

◆<- - - (★) Indicates the lock-up OFF point when the accelerator position is 90% or above.
(These do not need to be checked.)

(1 km/h = 0.6214 MPH)



Y-10 Inspection and Maintenance

1. Refer to “Inspection and Maintenance” in “Operation Manual” of its applicable crane.

2. Maintenance of line filter

Maintenance table

Part No.	Part name (usage)	Type of work	Qty.	Inspection and maintenance interval	
				600 h	2,400 h
				6 months	2 years
11-1	Suspension circuit	Cleaning	2 points		●
11-2					
19-1	Steering mode selection circuit	Replacement	1 point		●
19-2	Suspension lock circuit	Cleaning	1 point		●
19-3	Steering upper circuit	Replacement	1 point		●
19-4	Slewing pilot circuit	Cleaning	2 points		●
19-5					
19-6	Pilot valve circuit for boom slewing, boom telescoping/jib telescoping pedal	Cleaning	1 point		●
19-7	Pilot valve circuit for main winch/ auxiliary winch/boom elevation	Cleaning	1 point		●
19-8	Elevation proportional valve circuit	Cleaning	2 points		●
19-9					
19-10	Telescoping proportional valve circuit	Cleaning	1 point		●
19-11	Winch high-speed hoisting down circuit	Replacement	3 points		●
19-13					
19-14					
19-12	Telescoping lever operation selection circuit	Cleaning	1 point		●
19-15	Pilot pressure circuit	Cleaning	1 point		●
32	Steering and slewing pump circuit	Replacement	1 point		●(*1)
52-1	Automatic stop circuit	Replacement	2 points		●
52-2					
73	Winch brake circuit	Replacement	1 point		●
117-1	Upper pilot pressure source	Cleaning	1 point		●
12-1	Lower pilot pressure source	Cleaning	1 point		●

(Note): For the location of the parts, see "Z-1.1 Comparison table of hydraulic parts (part No., part name and location)”, "Z-6 Hydraulic Parts Location Diagram (Upper)" and "Z-7 Hydraulic Parts Location Diagram (Lower)" in the chapter Z.

(*1): Or when filter clogging warning lamp lights up.

Z-4

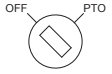
2.2 Composition of switch (for reference)

Rocker switch

UP	MIDDLE	DOWN	NAME
1-3	-	OFF	Working lamp, Power mode, Emergency transmission, Step lamp, Eco mode, Slewing brake
3-4	-	OFF	Lock pin
1-3	OFF	1-2	Outrigger J/S select, Outrigger extension/retraction selection, High/Low, drive mode select, Roof wiper
2-3	-	1-2	Jib mounting/stowing selection
<L-B><E-U>	OFF	<L-E><B-U>	Suspension lock (Lock/Free)
<b-d><a-e>	f-d, a-e	<f-d><b-e>	Power window
-	-	<2-3><5-6>	Electric retractable mirror

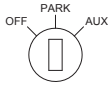
Notice: < > shows the momentary switch.

PTO switch



	1	2	Remarks
OFF			
PTO	○	●	

Parking brake switch



	1	2	3	4	Remarks
OFF	○	●			
PARK					
AUX			○	●	

Combination switch

Light switch circuit

Wire color	OFF									Connected to
	A	B	C	A	B	C	A	B	C	
5RW			○		○		○	○	○	POWER
6RW			○				○	○	○	Head lamp
7RL					○				○	Dimmer
8GL				○	○	○	○	○	○	POWER
9GW				○	○	○	○	○	○	Tail, clearance Turn, clearance

※ A: Push forward
B: Neutral
C: Pull backward

Exhaust brake switch

Wire color	OFF	ON
21L		○
22LY		○

※ Wire color
RW: R/W
RL: R/L
GL: G/L
GW: G/W
LY: L/Y
GB: G/B

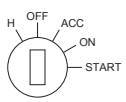
Wiper, Washer switch circuit

Wire color	OFF	INT	LOW	HIGH	WASHER	Connected to
11L					○	Washer motor
12O			○			Motor (Low)
13R		○				Amp
14W				○		Motor (High)
15B		○	○	○	○	Ground

Turn signal switch

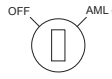
Wire color	Lever position			HORN	Connected to
	R	N	L		
1G	○		○		Flasher unit
2GB	○				Turn signal lamp
3GR			○		Turn signal lamp
4B				○	Horn solenoid

Starter switch



	B	G1	G2	ACC	M	ST	Remarks
H	●	○					Automatic return to “OFF”
OFF							
ACC	●			○			
ON	●			○	○		
START	●		○		○	○	Automatic return to “ON”

AML override switch

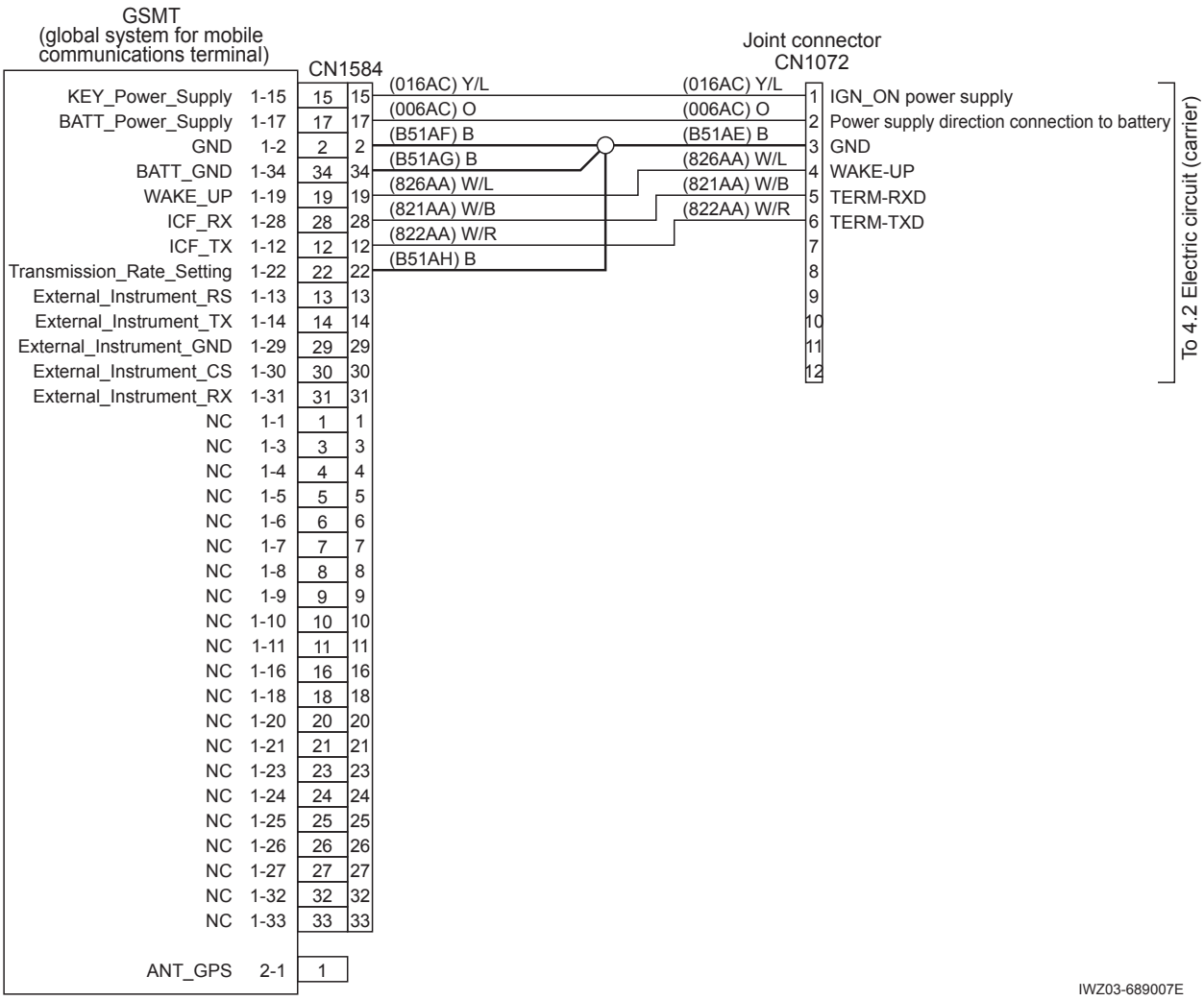


	1	2	Remarks
OFF			
AML override	○	●	Automatic return to “OFF”

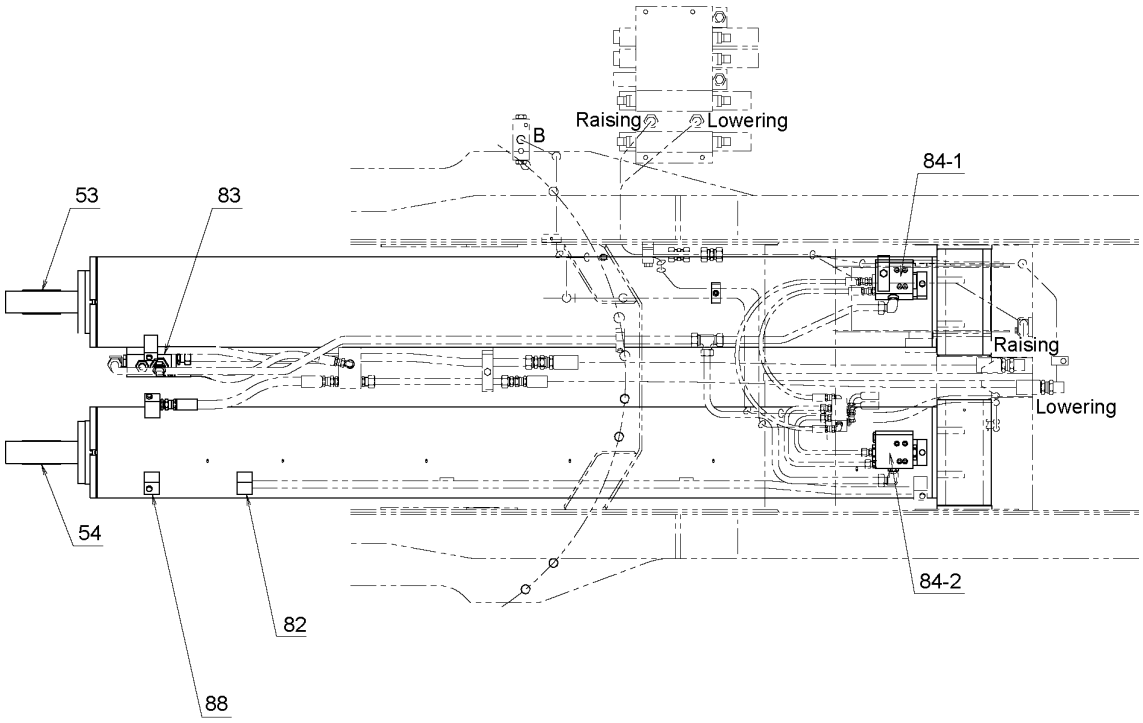
4.6 Electric circuit (GSMT)

[NOTICE]

1. If not specified, wire type is CAVS and wire size is 0.5 mm^2.



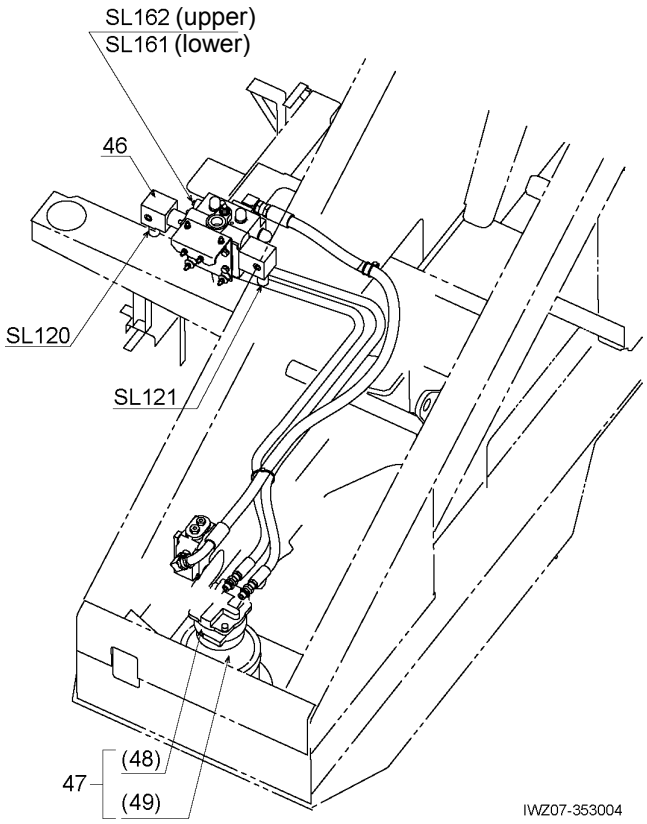
3. Elevation



IWZ07-353003E

343-455-32000 ②
342-410-20000 ①
343-546-82000 ⑧

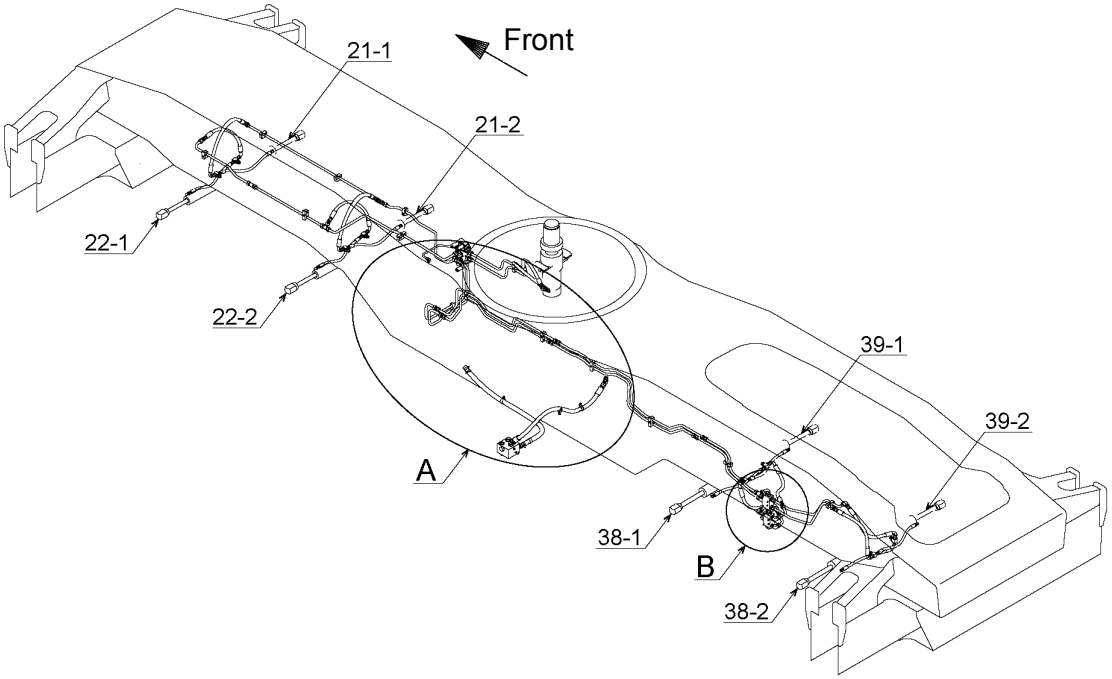
4. Slewing

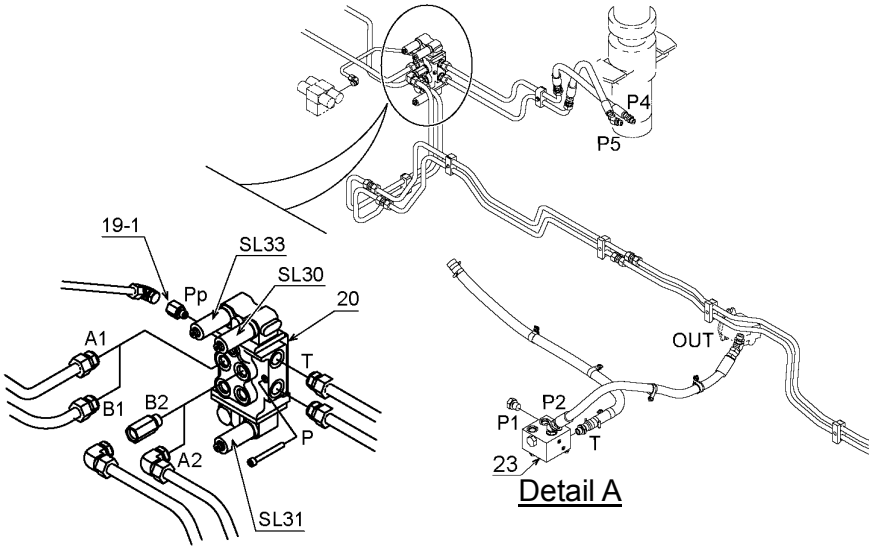


IWZ07-353004

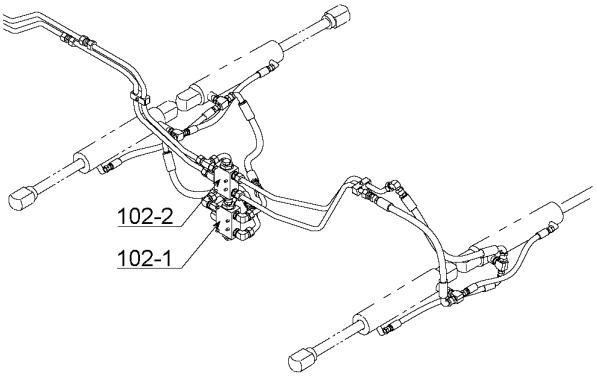
343-463-52500 ⑩
343-007-70000 ①

2. Steering





Detail A

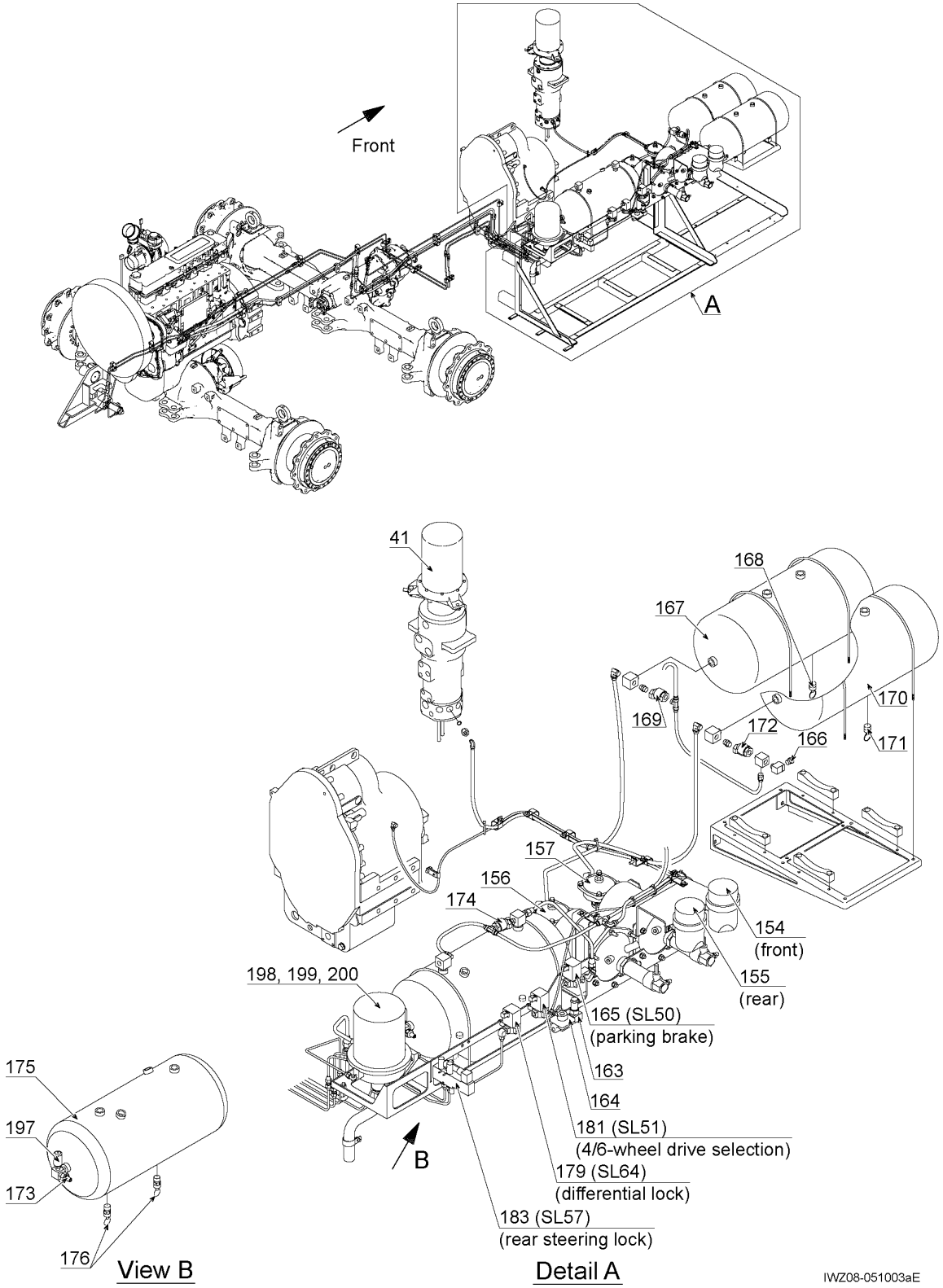


Detail B

IWZ07-354002a

346-416-62001 ①
347-220-21000 ②
347-224-33000 ①

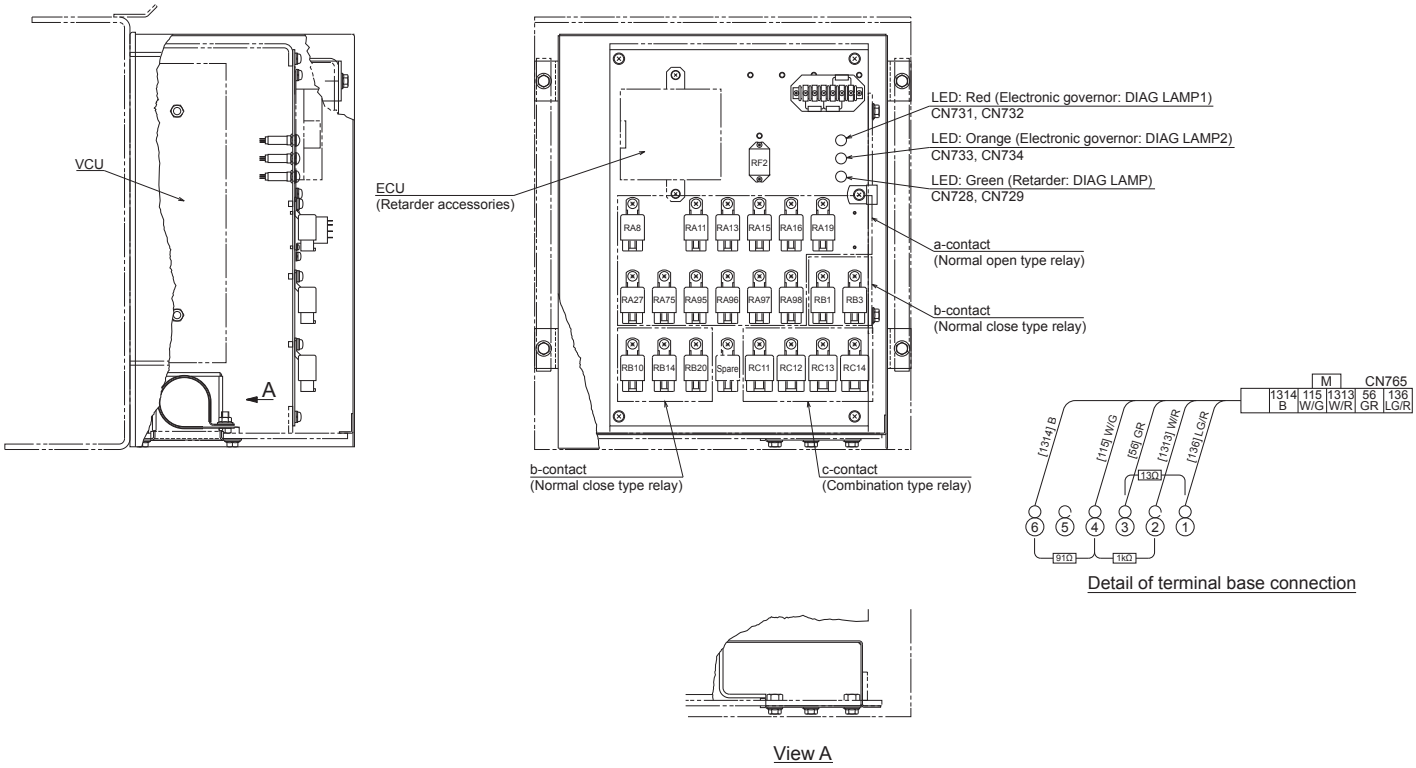
3. Control parts (lower)



349-230-02000 ⚠2
349-230-00000 ⚠2

Z-11

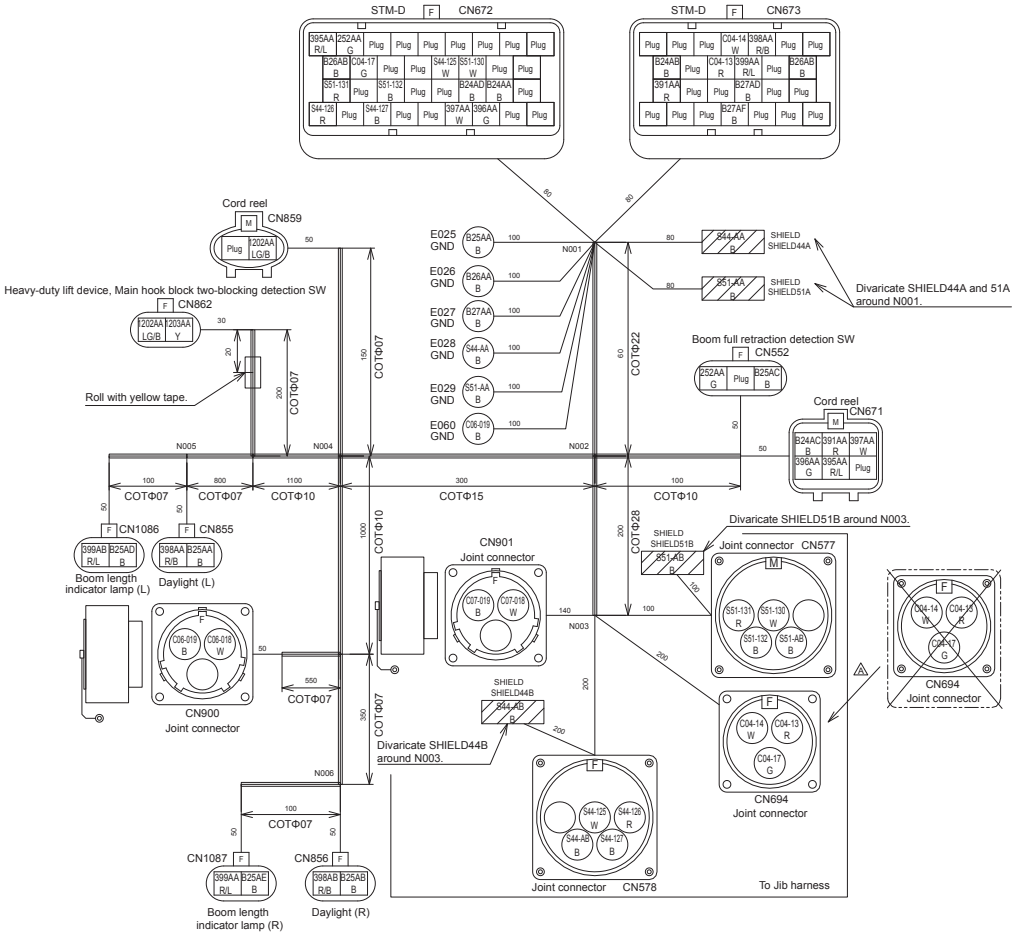
2. Lower electric unit box (VCU, ECU, DIAG LAMP)



Detail of terminal base connection

View A

4.2 Harness (boom top)



IWZ04-501102E

343-637-51101 ⚠
343-637-51102 ⚠

Applicable serial No. ⚠6: FE0636 --

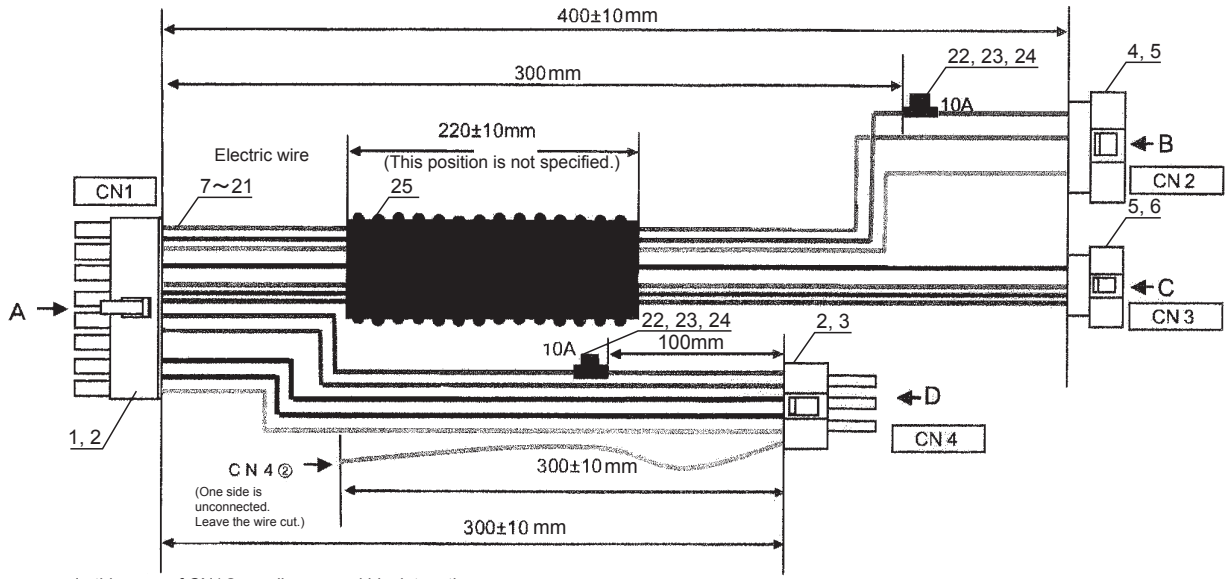
CN No.	Usage	Harness diagram coordinate
CN767	Fuse box (R)	A-19
CN768		B-19
CN769		C-19
CN770		A-20
CN771	Fuse box (R)	B-19
CN772		C-20
CN778	Upper power supply fuse (75 A)	C-21
CN780	Center joint	A-13
CN781		A-10
CN782		
CN783		A-11
CN784		
CN785		A-12
CN788	Joint connector to “air”	C-13
CN789		B-12
CN790	Joint connector to “Cummins Insite”	C-22
CN792	ECM (Cummins)	A-16
CN793	ECM (Cummins)	C-15
CN929	DIAG SW (for retarder)	M-7
CN945A	Side turn signal (L)	J-3
CN945B		
CN946A	Side turn signal (R)	B-3
CN946B		
CN950	Marker lamp	I-3
CN951		C-3
CN952		N-5
CN954		I-20
CN955		I-22
CN1003	CAN terminating resistance	G-16
CN1004	Head lamp relay	B-22
CN1008	Combination lamp (L)	K-1
CN1009	Combination lamp (R)	B-1
CN1017	Temperature SW (50°C/122°F)	E-8
CN1018	Temperature SW (85°C/185°F)	
CN1030	Diode (accelerator SW)	M-15
CN1031	Diode (emergency accelerator SW)	
CN1032	Diode (grid heater)	D-20
CN1059	Electrical box ground	C-20
CN1060	Diode (battery relay)	M-15
CN1075	Grid heater relay	D-21
CN1092	Electric retractable mirror motor (L2)	F-3
CN1284	Diode (coolant level detection)	D-20
CN1298	Diode (PTO)	N-14
CN1392	Joint connector to “DPF”	G-18
CN1474	Return filter clogging detection SW	C-6

CN No.	Usage	Harness diagram coordinate
CN1508	ECM DIAG SW (up)	L-7
CN1509	ECM DIAG SW (down)	
CN1511	ECM DIAG SW (up/down)	
CN1512	ECM DIAG/DPF regeneration SW	M-7
CN1514	Joint connector to “starter motor”	H-14
⚠6 CN1573	Marker lamp (option)	I-3
⚠6 CN1574		C-3
⚠6 CN1575		J-20
⚠6 CN1576		J-22
CN1606	Water pump (W/P)	G-10
CN1621	Diode (lock pin)	K-15
CN1622	Diode (DIAG lamp 1)	L-15
CN1623	Diode (DIAG lamp 2)	
CN1630A	Emergency head lamp	L-5
CN1630B		
CN1680	Fuse box (L)	A-18
CN1681		B-18
CN1682		C-18
CN1683		A-18
CN1684		B-18
CN1685		C-18
CN1690	Fuse box (U)	B-23
CN1691		C-23
CN1692		
CN1693		D-23
CN1720	Return filter clogging detection SW (GND)	D-6
JC02	Junction connector	N-12
JC03		N-17
JC04		O-17
JC05		O-12
JC06		E-20
JC07		O-17
RA8	Clearance lamp relay	L-16
RA11	Backup lamp relay	L-17
RA13	Retarder stop lamp relay	
RA15	Side back lamp relay	L-18
RA16	Emergency transmission selection relay 1	
RA19	Governor selection relay	L-19
RA27	Outrigger accelerator relay	M-16
RA75	Starter lock-out relay	M-17
RA95	Steering solenoid ground relay (lock pin OUT)	
RA96	Steering solenoid ground relay (lock pin release)	
RA97	PTO relay	M-18
RA98	Water pump relay	

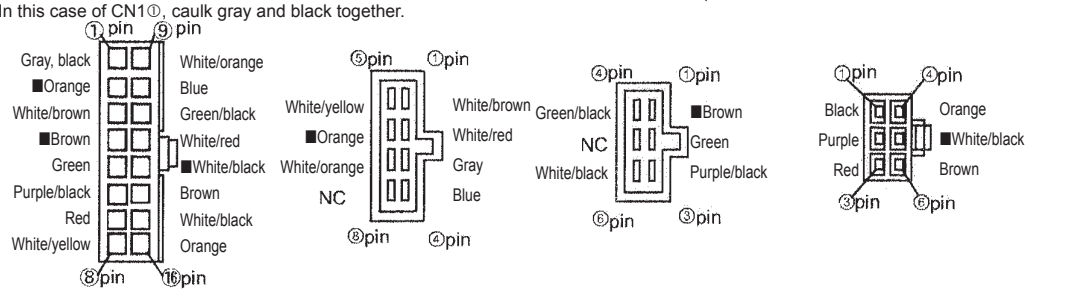
CN No.	Usage	Harness diagram coordinate
RB1	Transmission power supply cutoff relay	M-19
RB3	PTO limiter relay	
RB10	Battery power keeping relay	N-16
RB14	Starter cutoff relay	N-17
RB20	Coolant level detection SW relay	
RC11	Mirror (R) extension relay	N-18
RC12	Mirror (R) retraction relay	
RC13	Mirror (L) extension relay	N-19
RC14	Mirror (L) retraction relay	
RF2-1	Emergency transmission selection relay	L-21
RF2-2		M-20

3. Harness

3.1 Harness A



In this case of CN1①, caulk gray and black together.



CN1 connector front view (direction A) | CN2 connector front view (direction B) | CN3 connector front view (direction C) | CN4 connector front view (direction D)

No.	Component parts	Qty.	Type No., color, rating
25	Corrugated tube	1	CDP-B910-1 black L 220
24	Fuse terminal	4	5831-1115 (Sumiko Tec)
23	Blade fuse	2	10A
22	Fuse holder	2	09090011-10A
21	Electric wire (AVS 0.5 VW1)	1	Green/black
20	Electric wire (AVS 0.5 VW1)	1	Purple/black
19	Electric wire (AVS 0.5 VW1)	1	White/red
18	Electric wire (AVS 0.5 VW1)	1	White/yellow
17	Electric wire (AVS 0.5 VW1)	1	White/orange
16	Electric wire (AVS 0.5 VW1)	1	White/brown
15	Electric wire (AVS 0.5 VW1)	2	White/black
14	Electric wire (AVS 0.5 VW1)	2	Brown
13	Electric wire (AVS 0.5 VW1)	1	Gray
12	Electric wire (AVS 0.5 VW1)	1	Purple
11	Electric wire (AVS 0.5 VW1)	1	Black
10	Electric wire (AVS 0.5 VW1)	1	Green
9	Electric wire (AVS 0.5 VW1)	2	Orange
8	Electric wire (AVS 0.5 VW1)	2	Blue
7	Electric wire (AVS 0.5 VW1)	2	Red
6	Terminal	12	7114-2250 (YAZAKI)
5	Connector	1	7122-2865 (YAZAKI)
4	Connector	1	7122-2885 (YAZAKI)
3	Terminal	22	5556T
2	Connector	1	5557-06R-210 (molex)
1	Connector	1	5557-16R-210 (molex)

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