

1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This service manual mainly contains the necessary technical information for operations performed in a service workshop.

For ease of understanding, the manual is divided into the following sections.

SECTION 1 GENERAL

This section explains the safety hints and gives the specification of the machine and major components.

SECTION 2 STRUCTURE AND FUNCTION

This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

SECTION 3 HYDRAULIC SYSTEM

This section explains the hydraulic circuit, single and combined operation.

SECTION 4 ELECTRICAL SYSTEM

This section explains the electrical circuit, monitoring system and each component. It serves not only to give an understanding electrical system, but also serves as reference material for trouble shooting.

SECTION 5 MECHATRONICS SYSTEM

This section explains the computer aided power optimization system and each component.

SECTION 6 TROUBLESHOOTING

This section explains the troubleshooting charts correlating **problems** to **causes**.

SECTION 7 MAINTENANCE STANDARD

This section gives the judgement standards when inspecting disassembled parts.

SECTION 8 DISASSEMBLY AND ASSEMBLY

This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

SECTION 9 COMPONENT MOUNTING TORQUE

This section shows bolt specifications and standard torque values needed when mounting components to the machine.

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your HYUNDAI distributor for the latest information.

SECTION 1 GENERAL

Group 1 Safety Hints	1-1
Group 2 Specifications	1-10

SECTION 2 STRUCTURE AND FUNCTION

Group 1 Pump Device	2-1
Group 2 Main Control Valve	2-20
Group 3 Swing Device	2-47
Group 4 Travel Device	2-58
Group 5 RCV Lever	2-68
Group 6 RCV Pedal	2-75

SECTION 3 HYDRAULIC SYSTEM

Group 1 Hydraulic Circuit	3-1
Group 2 Main Circuit	3-2
Group 3 Pilot Circuit	3-5
Group 4 Single Operation	3-13
Group 5 Combined Operation	3-23

SECTION 4 ELECTRICAL SYSTEM

Group 1 Component Location	4-1
Group 2 Electrical Circuit	4-3
Group 3 Electrical Component Specification	4-21
Group 4 Connectors	4-29

SECTION 5 MECHATRONICS SYSTEM

Group 1 Outline	5-1
Group 2 Mode selection System	5-3
Group 3 Automatic Deceleration System	5-6
Group 4 Power Boost System	5-7
Group 5 Travel Speed Control System	5-8
Group 6 Automatic Warming Up Function	5-9
Group 7 Engine Overheat Prevention Function	5-10
Group 8 Variable Power Control System	5-11

Group 9 Attachment Flow Control System	5-12
Group 10 Anti-Restart System	5-13
Group 11 Self-Diagnostic System	5-14
Group 12 Engine Control System	5-27
Group 13 EPPR Valve	5-28
Group 14 Monitoring System	5-33
Group 15 Fuel Warmer System	5-56

SECTION 6 TROUBLESHOOTING

Group 1 Before troubleshooting	6-1
Group 2 Hydraulic and Mechanical System	6-4
Group 3 Electrical System	6-24
Group 4 Mechatronics System	6-40

SECTION 7 MAINTENANCE STANDARD

Group 1 Operational Performance Test	7-1
Group 2 Major Components	7-21
Group 3 Track and Work Equipment	7-29

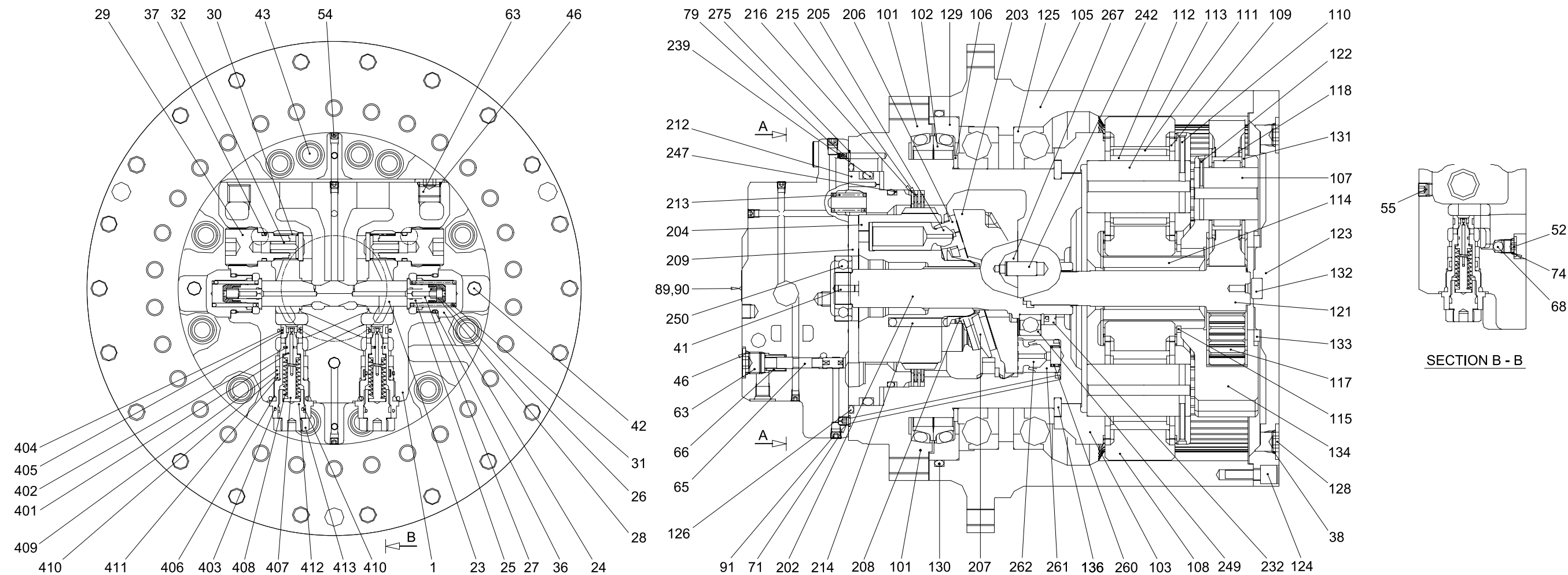
SECTION 8 DISASSEMBLY AND ASSEMBLY

Group 1 Precaution	8-1
Group 2 Tightening Torque	8-4
Group 3 Pump Device	8-7
Group 4 Main Control Valve	8-30
Group 5 Swing Device	8-54
Group 6 Travel Device	8-83
Group 7 RCV Lever	8-114
Group 8 Turning Joint	8-128
Group 9 Boom, Arm and Bucket Cylinder	8-133
Group 10 Undercarriage	8-150
Group 11 Work Equipment	8-162

SECTION 9 COMPONENT MOUNTING TORQUE

Group 1	Introduction guide	9-1
Group 2	Engine system	9-2
Group 3	Electric system	9-4
Group 4	Hydraulic system	9-6
Group 5	Undercarriage	9-10
Group 6	Structure	9-11
Group 7	Work equipment	9-14

2) STRUCTURE



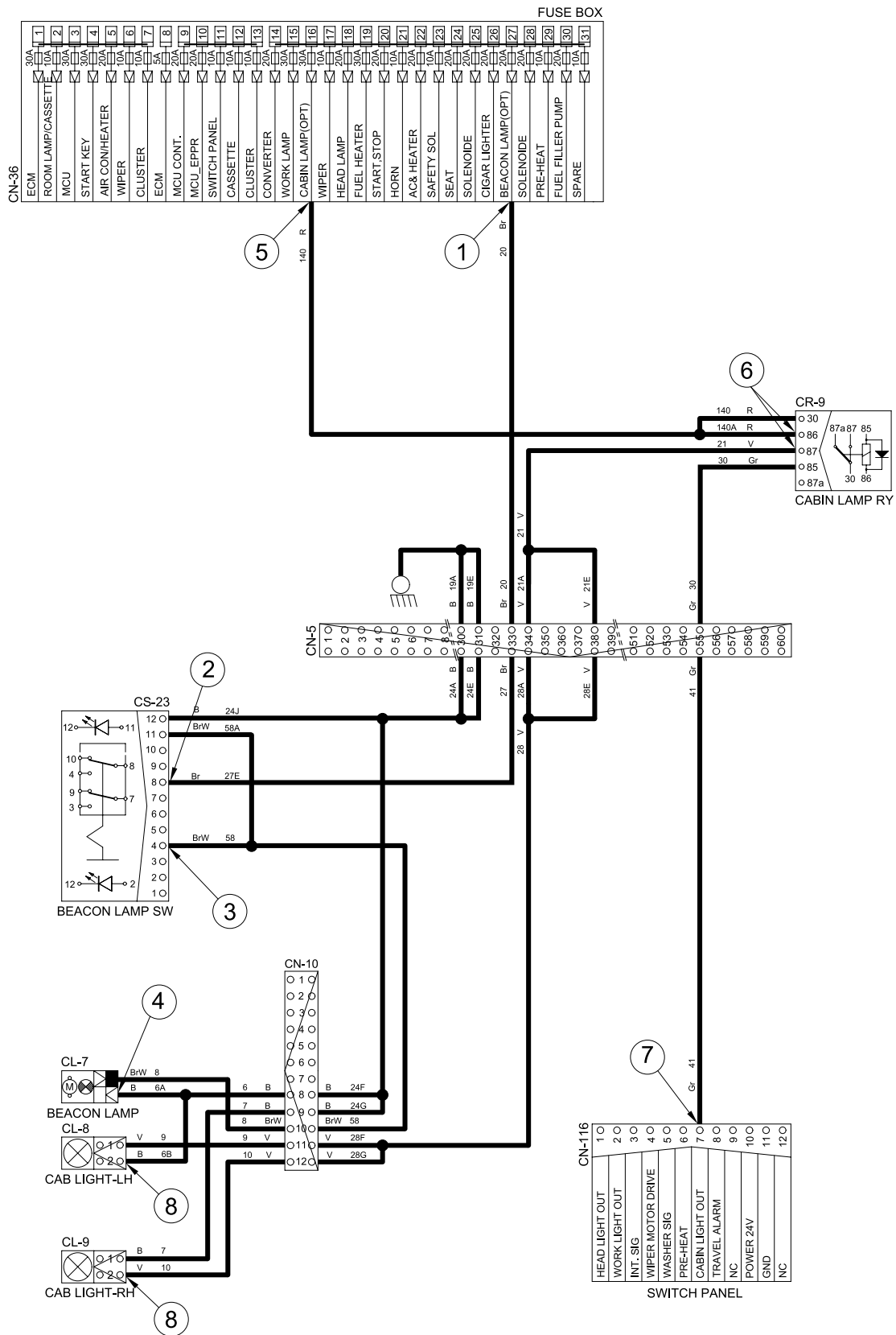
SECTION A - A

SECTION B - B

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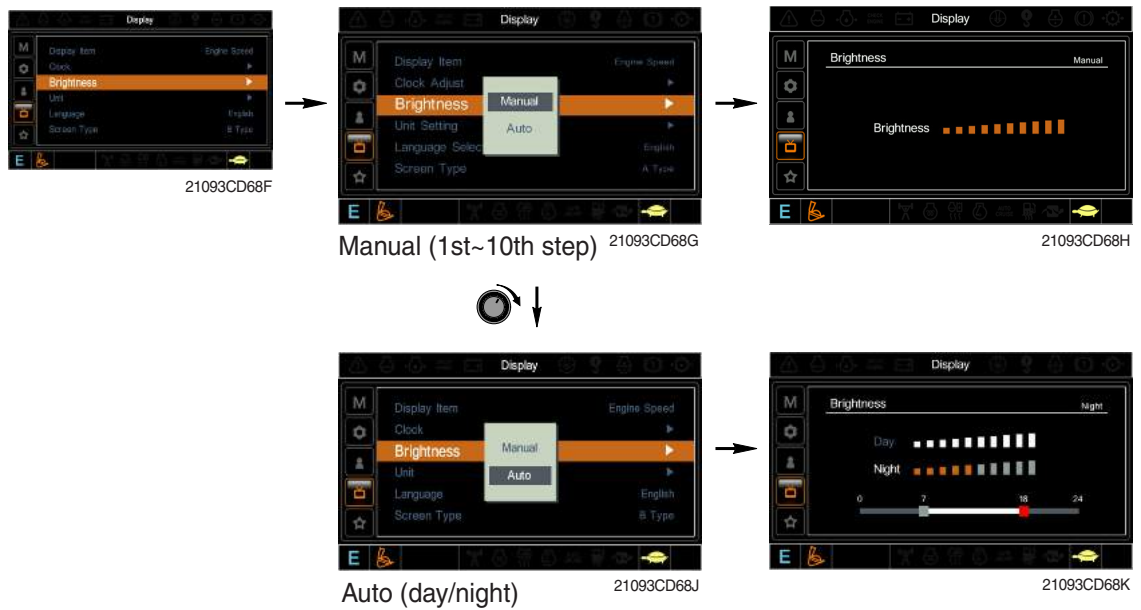
1	Rear flange	46	O-ring	106	Distance piece	126	O-ring	212	Piston (parking)	275	O-ring
23	Main spool	52	Plug	107	Shaft bearing (R)	128	Plug	213	Spring (parking)	401	Plunger
24	Plug (for main)	54	Plug	108	Planetary gear (F)	129	Seal ring	214	Spring (cylinder)	402	Piston seal
25	Stopper-A	55	Plug	109	Thrust washer (F)	130	O-ring	215	Friction plate	403	Body
26	Stopper-B	63	Plug	110	Pin spring	131	Thrust washer (R)	216	Mating plate	404	Back up ring
27	Spool	65	Spool (2 speed)	111	Needle bearing	132	Thrust washer (M)	232	Oil seal	405	O-ring
28	Spring	66	Spring (2 speed)	112	Floating bushing	133	Thrust washer	235	O-ring	406	O-ring
29	Plug (for check)	68	Steel ball	113	Shaft bearing (F)	134	Carrier No.1	239	O-ring	407	Spring retainer
30	Check valve	71	Orifice	114	Sun gear	136	Shim plate	242	Parallel pin	408	Spring
31	Spring (for main)	74	O-ring	115	Snap ring	202	Drive shaft	247	Back up ring	409	Piston
32	Spring (for check)	79	Filter	117	Planetary gear (R)	203	Swash plate (D type)	248	Back up ring	410	O-ring
36	O-ring	91	Plug	118	Needle bearing	204	Cylinder block	249	Ball bearing	411	Back up ring
37	O-ring	101	Spindle	121	Driver gear	205	Piston	250	Ball bearing	412	Adjust plug
38	O-ring	102	Floating seal	122	Pin spring	206	Shoe	260	Spring (2 speed)	413	Lock nut
41	Parallel pin	103	Carrier No.2	123	Cover	207	Retainer plate	261	Piston (2 speed)		
43	Socket bolt	105	Hub	124	Socket bolt	208	Thrust ball	262	Shoe (2 speed)		
				125	Angular ball bearing	209	Timing plate	267	Pivot		

BEACON LAMP AND CAB LIGHT CIRCUIT



25094EL09

③ Brightness



※ If "Auto" is chosen, brightness for day and night can be differently set up. Also by using the bar in lower side, users can define which time interval belongs to day and night. (in bar figure, gray area represents night time while white shows day time)

④ Unit



- Temperature : °C ↔ °F
- Pressure : bar ↔ MPa ↔ kgf/cm²
- Flow : lpm ↔ gpm
- Date format : yy/mm/dd ↔ mm/dd/yy ↔ dd-Mar-yy

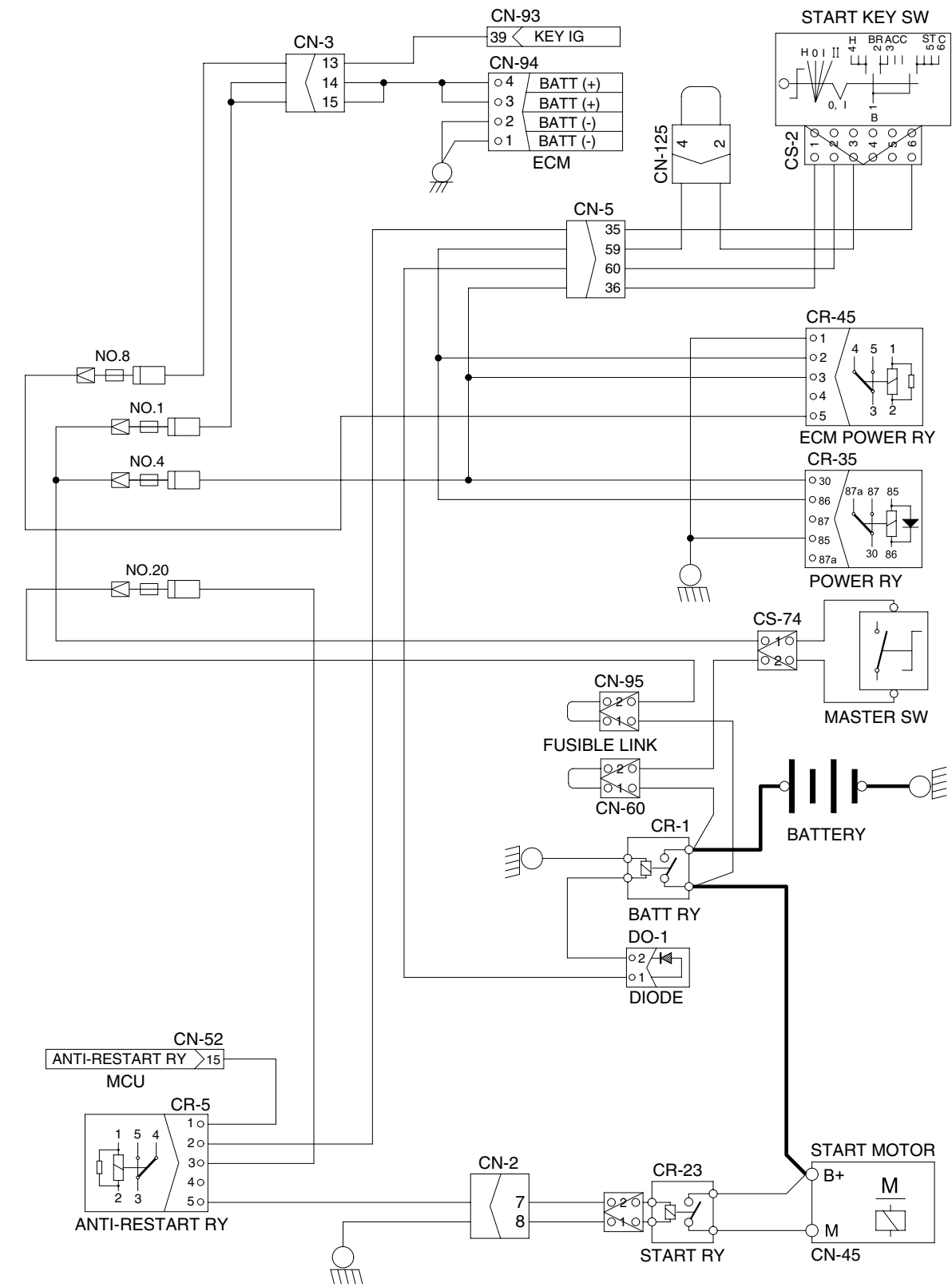
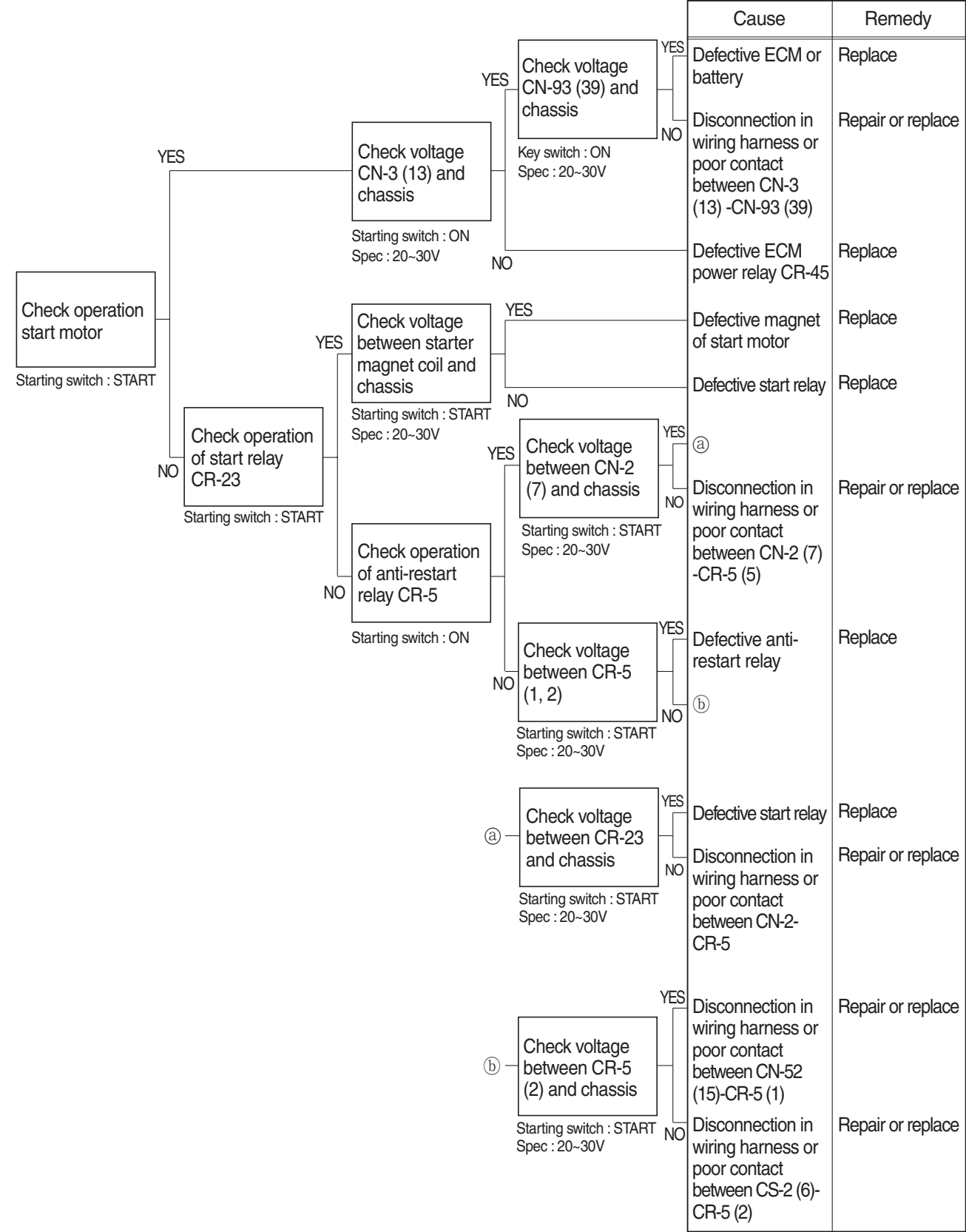
⑤ Language



- User can select preferable language and all displays are changed the selected language.

12. WHEN ENGINE DOES NOT START (lights up condition)

- Before disconnecting the connector, always turn the starting switch OFF.
- Before carrying out below procedure, check all the related connectors are properly inserted and short of fuse No. 1, 4, 8, 20.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.

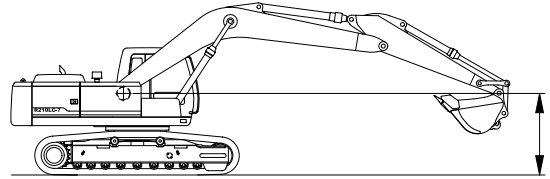


7) SWING FUNCTION DRIFT CHECK

- (1) Measure the swing drift on the bearing outer circumference when stopping after a 360° full speed swing.

(2) Preparation

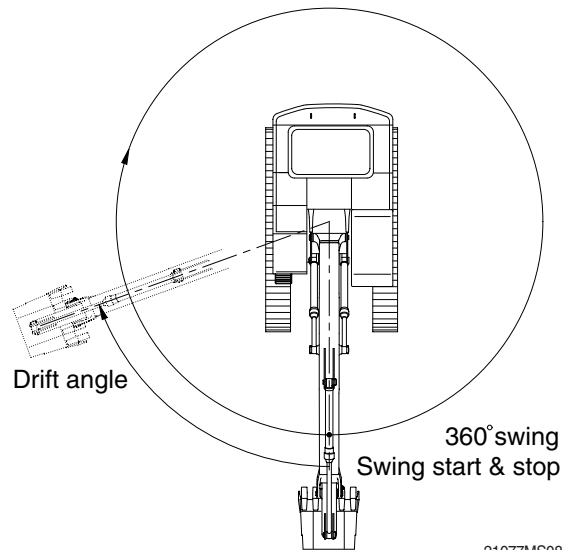
- ① Check the lubrication of the swing gear and swing bearing.
- ② Place the machine on flat, solid ground with ample space for swinging. Do not conduct this test on slopes.
- ③ With the arm rolled out and bucket rolled in, hold the bucket so that the height of the bucket pin is the same as the boom foot pin. The bucket must be empty.
- ④ Make two chalk marks: one on the swing bearing and one directly below it on the track frame.
- ⑤ Swing the upperstructure 360°.
- ⑥ Keep the hydraulic oil temperature at $50 \pm 5^{\circ}\text{C}$.



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(3) Measurement

- ① Conduct this test in the M mode.
- ② Select the following switch positions.
 - Power mode switch : P mode
- ③ Operate the swing control lever fully and return it to the neutral position when the mark on the upperstructure aligns with that on track frame after swinging 360°
- ④ Measure the distance between the two marks.
- ⑤ Align the marks again, swing 360° , then test the opposite direction.
- ⑥ Repeat steps ④ and ⑤ three times each and calculate the average values.



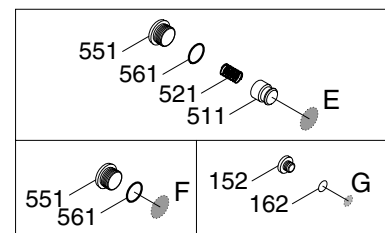
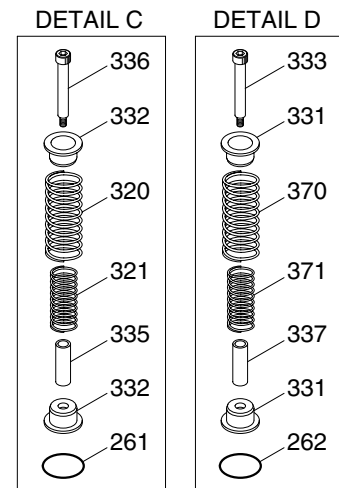
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(4) Evaluation

The measured drift angle should be within the following specifications.

Unit : Degree

Model	Power mode switch	Standard	Maximum allowable	Remarks
R250LC-9	P mode	90 below	157.5	



421

(12) Assembling of main spool (travel (301), bucket (304), swing (305), option (309), arm2 (306), boom2 (307), swing priority (311)):

- ① Hold the middle of each spool in the mouthpiece-attached vise applying a protection plate (aluminum plate and the like) in between. Attach the spring seats (332), springs and stopper (335 or 339) and tighten the spacer bolt (336) with specified torque.

※ Before tightening the spacer bolt (336), apply loctite #262 to it.

- Hexagon key wrench : 10 mm
- Tightening torque : 1.6 ~ 1.8 kgf·m
(11.6~13.0 lbf·ft)

※ Pay attention not to fasten the vise excessively to the shape of the spool is deformed.

- ② Insert the spool assemblies of Items ① above into the P2 housing (101) and P1 housing (102).

※ Fit spool assemblies into P2 housing (101) and P1 housing (102) carefully and slowly.

※ Do not push them forcibly without fail.



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- ⑨ Remove lock washer (27) by removal jig and loosen hex bolt (28) with fixing pinion gear (25) and thereafter plate lock (26) & pinion gear (25).



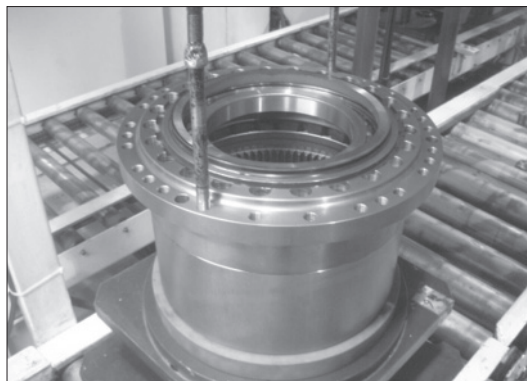
- ⑩ Loosen hex bolt (6) and remove spacer (3) and cover plate by screwing a removal bolt into tap hole on the cover plate (5).



- ⑪ Dismantle drive shaft by using jig
- ※ Removed oil seal should not be reused. Replace new oil seal when assembling.

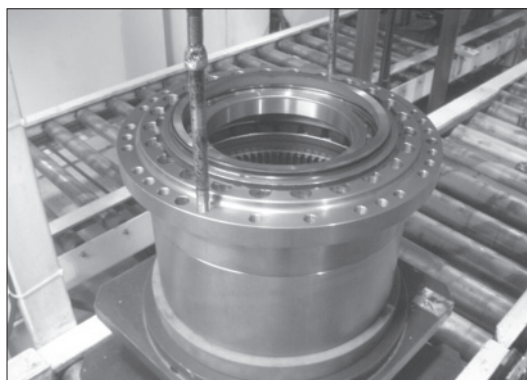


- ② Setting reduction unit on work stand for disassembling. Remove M16 hexagon socket head bolts that secure ring gear and housing assembly.



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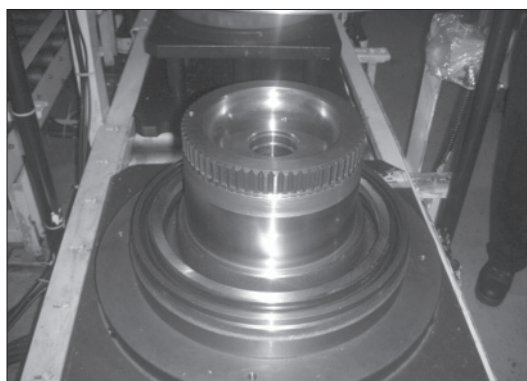
- ③ As the ring gear is adhered to housing assy, disassemble housing assy and ring gear by lightly hammering slantwise upward using sharpen punch inserted between the housing assy and ring gear.



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(9) Removing floating seal

- ① Lift up a piece of floating seal of motor side.



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(10) Removing housing sub assembly

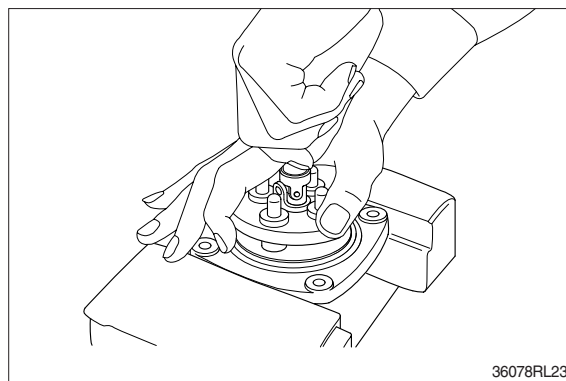
- ① Setting housing assembly on work stand for disassembling.
② After setting housing, lift up a piece of floating seal from housing and then remove it.

※ Don't disassemble angular bearing.



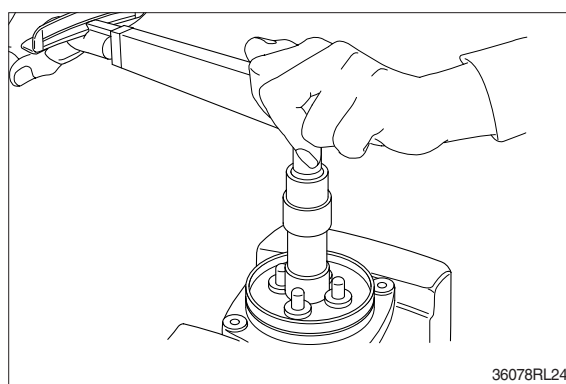
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- (9) When return spring is strong in force, assemble 4 sets at the same time, utilizing plate (17), and tighten joint (19) temporarily.

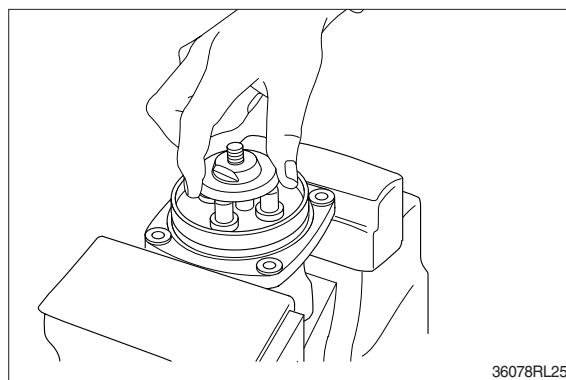


- (10) Fit plate (17).

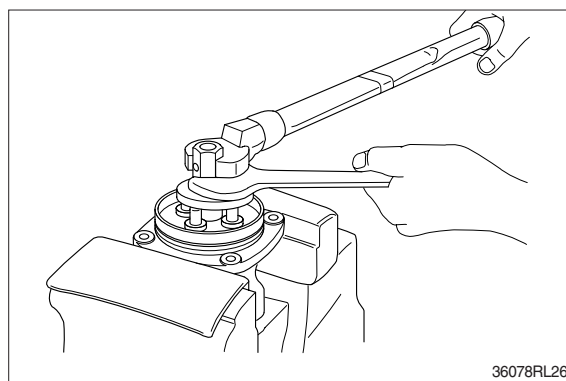
- (11) Tighten joint (19) with the specified torque to casing, utilizing jig.



- (12) Assemble swash plate (20) to joint (19).
- ※ Screw it to position that it contacts with 4 push rods evenly.
 - ※ Do not screw it over.

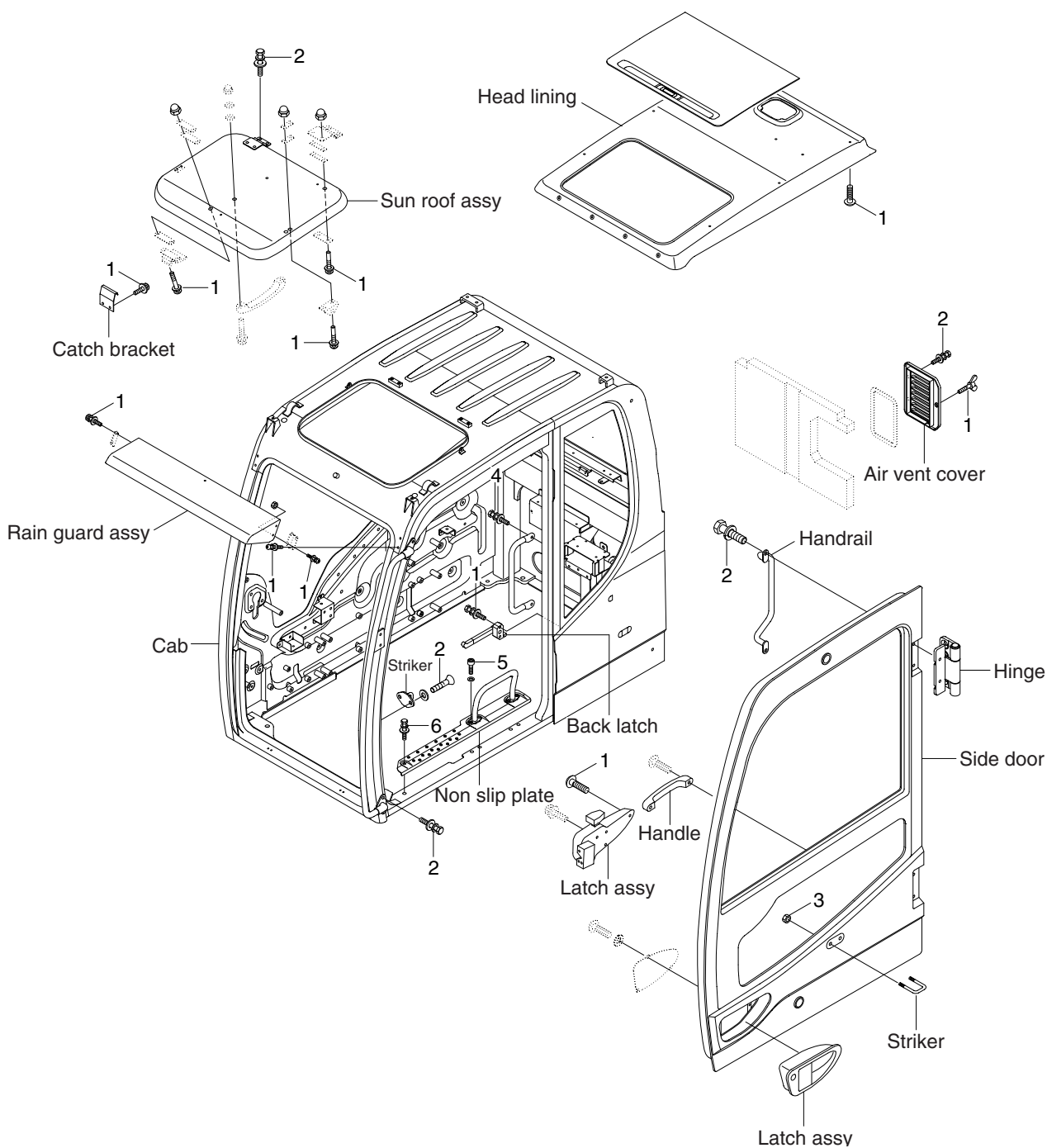


- (13) Assemble adjusting nut (21), apply spanner to width across flat of plate (20) to fix it, and tighten adjusting nut to the specified torque.
- ※ During tightening, do not change position of disk.



GROUP 6 STRUCTURE

CAB AND ACCESSORIES MOUNTING



21099CM10

• Tightening torque

Item	Size	kgf · m	lbf · ft
1	M 6×1.0	1.44±0.3	10.4±2.2
2	M 8×1.25	2.5±0.5	18.1±3.6
3	M10×1.5	4.7±0.9	34±6.5

Item	Size	kgf · m	lbf · ft
4	M10×1.5	6.9±1.4	49.9±10.1
5	M10×1.5	8.27±1.7	59.8±12.3
6	M12×1.75	12.8±3.0	92.6±21.7