PART NO. TTNEJ-EN-00

HITACHI

Reliable solutions

Technical Manual
Troubleshooting

ZW

220-5A
Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TONEJ-EN
Technical Manual (Troubleshooting)	: Vol. No.TTNEJ-EN
Workshop Manual	: Vol. No.WNEJ-EN

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SECTION 4

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ECM FAULT CODE CONTRAST LIST

Fault Code (MP.Dr.)	Trouble (Cause)	Fault Code (INSITE)	Lighting Indicator
84-2	Wheel-Based Vehicle Speed-Data Erratic, Intermittent, or Incorrect. The ECM lost the vehicle speed signal.	241	Service Indicator
84-10	Wheel-Based Vehicle Speed Sensor Circuit tampering has been detected-Abnormal Rate of Change. Signal indicates an intermittent connection or VSS tampering.	242	Service Indicator
91-0	Accelerator Pedal or Lever Position Sensor 1-Data Valid but Above Normal Operational Range-Most Severe Level. A frequency of more than 1500 Hz has been detected at the frequency throttle input to the ECM.	148	Engine Warning Indicator
91-1	Accelerator Pedal or Lever Position 1 Sensor Circuit Frequency-Data Valid but Below Normal Operational Range-Most Severe Level. A frequency of less than 100 Hz has been detected at the frequency throttle input to the ECM.	147	Engine Warning Indicator
91-3	Accelerator Pedal or Lever Position Sensor 1 Circuit-Voltage Above Normal, or Shorted to High Source. High voltage detected at accelerator pedal position circuit.	131	Engine Warning Indicator
91-4	Accelerator Pedal or Lever Position Sensor 1 Circuit-Voltage Below Normal, or Shorted to Low Source. Low voltage detected at accelerator pedal position signal circuit.	132	Engine Warning Indicator
91-19	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System-Received Network Data In Error. The OEM vehicle electronic control unit (VECU) detected a fault with its accelerator pedal.	287	Service Indicator
93-2	Auxiliary Alternate Torque Validation Switch-Data Erratic, Intermittent, or Incorrect.	528	Service Indicator

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Air Conditioner Controller Fault Codes E11 to E22

Preparation

- Check the wiring connections first.
- Before inspection, set the key switch to the ON position.

Fault Code	Trouble	Inspection Method	Evaluation	Cause
E11	Open circuit in re-circulated air sensor	Measurement of resistance between sensor #1 and #2.	∞ Ω (Normal value: 300 to 430 kΩ)	Faulty sensor.
		Measurement of voltage between sensor harness end #1 and body.	0 V	Open circuit in harness #1.
		-	Normal in above check.	Open circuit in harness #2.
E12	Shorted circuit in re-circulated air sensor	Measurement of resistance between sensor #1 and #2.	0 Ω (Normal value: 300 to 430 kΩ)	Faulty sensor.
		-	Normal in above check.	Shorted circuit in harness #1 and #2.
E13	Open circuit in outdoor ambient temperature sensor	Measurement of resistance between sensor #1 and #2.	∞ Ω (Normal value: 100 to 210 kΩ)	Faulty sensor.
		Measurement of voltage between sensor harness end #1 and body.	0 V	Open circuit in harness #1.
		-	Normal in above check.	Open circuit in harness #2.
E14	Shorted circuit in outdoor ambient temperature sensor	Measurement of resistance between sensor #1 and #2.	0 Ω (Normal value: 100 to 210 kΩ)	Faulty sensor.
		-	Normal in above check.	Shorted circuit in harness #1 and #2.
E18	Shorted circuit in solar radiation sensor	Continuity check between sensor harness end #1 and #2.	0 Ω	Shorted circuit in harness #1 and #2.
		-	Normal in above check.	Faulty sensor.
E21	Open circuit in frost sensor	Measurement of resistance between sensor #1 and #2.	∞ Ω (Normal value: 100 to 115 kΩ)	Faulty sensor.
		Measurement of voltage between sensor harness end #1 and body.	0 V	Open circuit in harness #1.
		-	Normal in above check.	Open circuit in harness #2.
E22	Shorted circuit in frost sensor	Measurement of resistance between sensor #1 and #2.	0 Ω (Normal value: 100 to 115 kΩ)	Faulty sensor.
		-	Normal in above check.	Shorted circuit in harness #1 and #2.

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REAR FRAME HARNESS

Applicable Machine

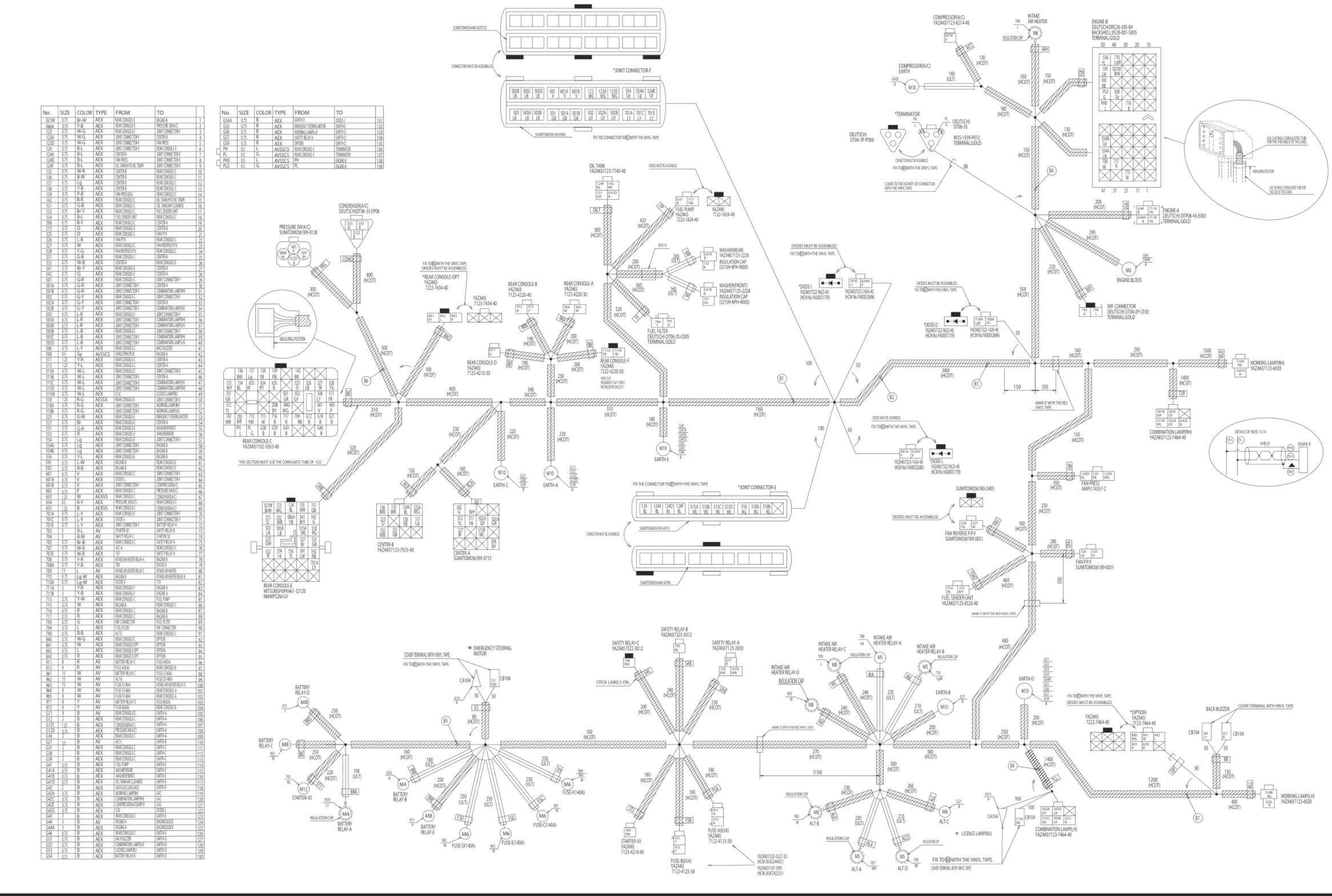
Attach to vol. No	Model
TTNDJ-EN-00	ZW180-5A
TTNEJ-EN-00	ZW220-5A

⚠ CAUTION: Parts numbers on the drawing are provided only for reference purpose. To order parts on the drawing, be sure to consult the Parts Catalog.

The Attached Diagram	Technical manual
SMCZ	MC (Main Controller)
ICZ	Information Controller
MONITOR	Column Display Controller
A/C	Air Conditioner Controller UNIT

No.	SIZE	COLOR	TYPE	FROM	TO	
021M	0.75	Br-W	AEX	REAR CONSOLE-E	ENGINE-B	1
086A	0.75	Y-B	AEX	REAR CONSOLE-E	PRESSURE SW(A/C)	2
123	0.75	W-G	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	3
123A	0.75	W-G	AEX	JOINT CONNECTOR-F	CENTER-B	4
123D	0.75	W-G	AEX	JOINT CONNECTOR-F	FAN PRESS	5
124	0.75	B-L	AEX	JOINT CONNECTOR-E	REAR CONSOLE-E	6
124A	0.75	B-L	AEX	CENTER-B	JOINT CONNECTOR-F	7
124D	0.75	B-L	AEX	FAN PRESS	JOINT CONNECTOR-F	8
124F	0.75	B-L	AEX	OIL TANK(HYDR. TEMP)	JOINT CONNECTOR-F	9
135	0.75	W-R	AEX	CENTER-B	REAR CONSOLE-E	10
136	0.75	B-W	AEX	CENTER-B	REAR CONSOLE-C	11
137	0.75	Lg	AEX	CENTER-B	REAR CONSOLE-C	12
138	0.75	Y-B	AEX	CENTER-B	REAR CONSOLE-C	13
139	0.75	P-B	AEX	FAN PRESS(PV)	REAR CONSOLE-C	14
142	0.75	B-R	AEX	REAR CONSOLE-C	OIL TANK(HYDR. TEMP)	15
151	0.75	G-B	AEX	REAR CONSOLE-E	OIL TANK(AIR CLEANER	16
153	0.75	Br-Y	AEX	REAR CONSOLE-C	FUEL SENDER UNIT	17
154	0.75	B-L	AEX	FUEL SENDER UNIT	REAR CONSOLE-C	18
208	0.75	B-Y	AEX	REAR CONSOLE-C	CENTER-A	19
215	0.75	O	AEX	REAR CONSOLE-E	CENTER-B	20
326	0.75	O	AEX	REAR CONSOLE-C	FAN PPV	21
328	0.75	L-B	AEX	FAN PPV	REAR CONSOLE-C	22
327	0.75	W	AEX	REAR CONSOLE-C	FAN REVERSE P.P.V	23
328	0.75	Y-G	AEX	FAN REVERSE P.P.V	REAR CONSOLE-C	24
331	0.75	G-B	AEX	REAR CONSOLE-C	CENTER-B	25
332	0.75	W-B	AEX	CENTER-B	REAR CONSOLE-E	26
341	0.75	Br-Y	AEX	REAR CONSOLE-E	CENTER-A	27
342	0.75	G	AEX	REAR CONSOLE-E	CENTER-A	28
501	0.75	G-R	AEX	REAR CONSOLE-C	JOINT CONNECTOR-F	29
501A	0.75	G-R	AEX	JOINT CONNECTOR-F	CENTER-A	30
501B	0.75	G-R	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(RH)	31
502	0.75	G-Y	AEX	REAR CONSOLE-C	JOINT CONNECTOR-F	32
502A	0.75	G-Y	AEX	JOINT CONNECTOR-F	CENTER-A	33
502B	0.75	G-Y	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(LH)	34
503	0.75	L-R	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	35
503A	0.75	L-R	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(RH)	36
503B	0.75	L-R	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(LH)	37
505B	0.75	L-B	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	38
505C	0.75	L-B	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(RH)	39
505D	0.75	L-B	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(LH)	40
506	0.75	L-Y	AEX	REAR CONSOLE-C	BACK BUZZER	41
508	0.5	Gy	AVSSCS	SHIELD(MONITOR)	ENGINE-B	42
511	1.25	Y-R	AEX	REAR CONSOLE-C	CENTER-A	43
512	1.25	Y-L	AEX	REAR CONSOLE-C	CENTER-A	44
515A	0.75	W-L	AEX	REAR CONSOLE-E	JOINT CONNECTOR-E	45
515B	0.75	W-L	AEX	JOINT CONNECTOR-E	CENTER-A	46
515C	0.75	W-L	AEX	JOINT CONNECTOR-E	COMBINATION LAMP(LH	47
515D	0.75	W-L	AEX	JOINT CONNECTOR-E	COMBINATION LAMP(RH	48
515W	0.75	W-L	AEX	515C	LICENCE LAMP(RU)	49
518	1.25	R-G	AESSX	REAR CONSOLE-E	JOINT CONNECTOR-F	50
518A	0.75	R-G	AEX	JOINT CONNECTOR-F	WORKING LAMP-(RH	51
518B	0.75	R-G	AEX	JOINT CONNECTOR-F	WORKING LAMP-(LH	52
525	0.75	G-W	AEX	REAR CONSOLE-E	EMERGENCY STEERING MOTOR	53
527	0.75	Br	AEX	REAR CONSOLE-E	CENTER-A	54
531	0.75	G-R	AEX	REAR CONSOLE-E	WASHER(FRONT)	55
532	0.75	R	AEX	REAR CONSOLE-E	WASHER(REAR	56
554	0.75	Lg	AEX	REAR CONSOLE-F	JOINT CONNECTOR-F	57
554A	0.75	Lg	AEX	JOINT CONNECTOR-F	ENGINE-B	58
554B	0.75	Lg	AEX	JOINT CONNECTOR-F	ENGINE-B	59
556	0.75	Y-L	AEX	REAR CONSOLE-E	ENGINE-B	60
591	0.75	L-W	AEX	ENGINE-B	REAR CONSOLE-E	61
592	0.75	R-B	AEX	ENGINE-B	REAR CONSOLE-E	62
601	0.75	V	AEX	REAR CONSOLE-C	JOINT CONNECTOR-F	63
601A	0.75	V	AEX	DIODE-L	JOINT CONNECTOR-F	64
601B	0.75	V	AEX	JOINT CONNECTOR-F	COMPRESSOR(A/C)	65
605	0.75	P	AEX	REAR CONSOLE-C	PRESSURE SW(A/C)	66
633	1.25	W	AEXVS	REAR CONSOLE-C	CONDENSER(A/C)	67
634	0.5	R-Y	AEX	PRESSURE SW(A/C)	REAR CONSOLE-C	68
635	1.25	B	AEXVS	REAR CONSOLE-C	CONDENSER(A/C)	69
701A	0.75	L-Y	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	70
701C	0.75	L-Y	AEX	DIODE-T	JOINT CONNECTOR-F	71
701E	0.75	L-Y	AEX	JOINT CONNECTOR-F	BATTERY RELAY-A	72
703	5	R-L	AV	STARTER-30	SAFETY RELAY-B	73
704	5	B-W	AV	SAFETY RELAY-C	STARTER-50	74
705	0.75	Br-B	AEX	REAR CONSOLE-C	SAFETY RELAY-A	75
707	0.75	W-R	AEX	ALT-A	REAR CONSOLE-C	76
707E	0.75	W-R	AEX	707	SAFETY RELAY-A	77
708	0.75	Y-R	AEX	INTAKE AIR HEATER RELAY-A	ENGINE-B	78
708A	0.75	Y-R	AEX	708	DIODE-D	79
709	15	L	AV	INTAKE AIR HEATER RELAY-C	INTAKE AIR HEATER	80
710	0.75	Lg-W	AEX	ENGINE-B	INTAKE AIR HEATER RELAY-B	81
710A	0.75	Lg-W	AEX	DIODE-S	710	82
711A	3	Y-B	AEX	REAR CONSOLE-F	ENGINE-A	83
711B	3	Y-B	AEX	REAR CONSOLE-F	ENGINE-A	84
713	0.75	Y-W	AEX	REAR CONSOLE-C	FUEL PUMP	85
715	0.75	W	AEX	ENGINE-A	REAR CONSOLE-C	86
716	0.75	B	AEX	REAR CONSOLE-C	ENGINE-B	87
717	0.75	R	AEX	REAR CONSOLE-C	ENGINE-B	88
793	0.75	G	AEX	WF CONNECTOR	FUEL FILTER	89
794	0.75	L	AEX	FUEL FILTER	WF CONNECTOR	90
799	0.75	R-B	AEX	ALT-B	REAR CONSOLE-C	91
840	0.75	W-G	AEX	REAR CONSOLE-C	OPTION	92
841	0.75	W	AEX	REAR CONSOLE-OPT	OPTION	93
842	0.75	L	AEX	REAR CONSOLE-OPT	OPTION	94
843	0.75	R	AEX	REAR CONSOLE-OPT	OPTION	95
911	8	R	AV	BATTERY RELAY-E	FUSE-A(40A)	96
912	8	R	AV	FUSE-A(40A)	REAR CONSOLE-B	97
961	15	W	AV	BATTERY RELAY-C	FUSE-C(140A)	98
962	15	W	AV	ALT-B	FUSE-D(140A)	99
963	15	W	AV	FUSE-E(140A)	INTAKE AIR HEATER RELAY-D	100
964	8	W	AV	FUSE-F(140A)	REAR CONSOLE-A	101
965	8	W	AV	FUSE-F(140A)	REAR CONSOLE-A	102
971	8	Y	AV	BATTERY RELAY-D	FUSE-B(65A)	103
972	8	Y	AV	FUSE-B(65A)	REAR CONSOLE-B	104
G11	8	B	AV	REAR CONSOLE-D	EARTH-A	105
G12	2	B	AEX	REAR CONSOLE-C	EARTH-A	106
G12C	1.25	B	AEX	CONDENSER(A/C)	EARTH-A	107
G12D	0.75	B	AEX	PRESSURE SW(A/C)	EARTH-A	108
G18	2	B	AEX	REAR CONSOLE-C	EARTH-A	109
G21	15	B	AV	ALT-C	EARTH-B	110
G31	2	B	AEX	REAR CONSOLE-C	EARTH-C	111
G38	2	B	AEX	REAR CONSOLE-C	EARTH-C	112
G39	2	B	AEX	REAR CONSOLE-C	EARTH-C	113
G41	0.75	B	AEX	FUEL PUMP	EARTH-E	114
G41A	0.75	B	AEX	WASHER(REAR	EARTH-E	115
G41B	0.75	B	AEX	WASHER(FRONT)	EARTH-E	116
G41D	0.75	B	AEX	OIL TANK(AIR CLEANER)	EARTH-E	117
G42	2	B	AEX	CASE(GAS CAR) GND	EARTH-E	118
G42A	0.75	B	AEX	WORKING LAMP(RH	GA2	119
G42C	0.75	B	AEX	COMBINATION LAMP(RH	GA2	120
G42E	0.75	B	AEX	COMPRESSOR(A/C)BODY	GA2	121
G42G	0.75	B	AEX	GA	DIODE-L	122
G43	2	B	AEX	REAR CONSOLE-C	EARTH-E	123
G44	3	B	AV	ENGINE-A	ENGINE BLOCK	124
G44A	3	B	AEX	ENGINE-A	ENGINE BLOCK	125
G46	0.75	B	AEX	REAR CONSOLE-C	EARTH-E	126
G51	0.75	B	AEX	BACK BUZZER	EARTH-D	127
G52	0.75	B	AEX	COMBINATION LAMP(LH	EARTH-D	128
G53	0.75	B	AEX	LICENCE LAMP(RU)	EARTH-D	129
G54	0.75	B	AEX	BATTERY RELAY-B	EARTH-D	130

No.	SIZE	COLOR	TYPE	FROM	TO	
G54A	0.75	B	AEX	EARTH-D	DIODE-J	131
G55	0.75	B	AEX	EARTH(F.STEERING MOTOR	EARTH-D	132
G56	0.75	B	AEX	WORKING LAMP(LH)	EARTH-D	133
G57	0.75	B	AEX	SAFETY RELAY-A	EARTH-D	134
G59	0.75	B	AEX	OPTION	EARTH-D	135
PH	0.5	L	AVSSCS	REAR CONSOLE-C	TERMINATOR	136
PL	0.5	G	AVSSCS	REAR CONSOLE-C	TERMINATOR	137
PHD	0.5	L	AVSSCS	PH	ENGINE-B	138
PLD	0.5	G	AVSSCS	PL	ENGINE-B	139



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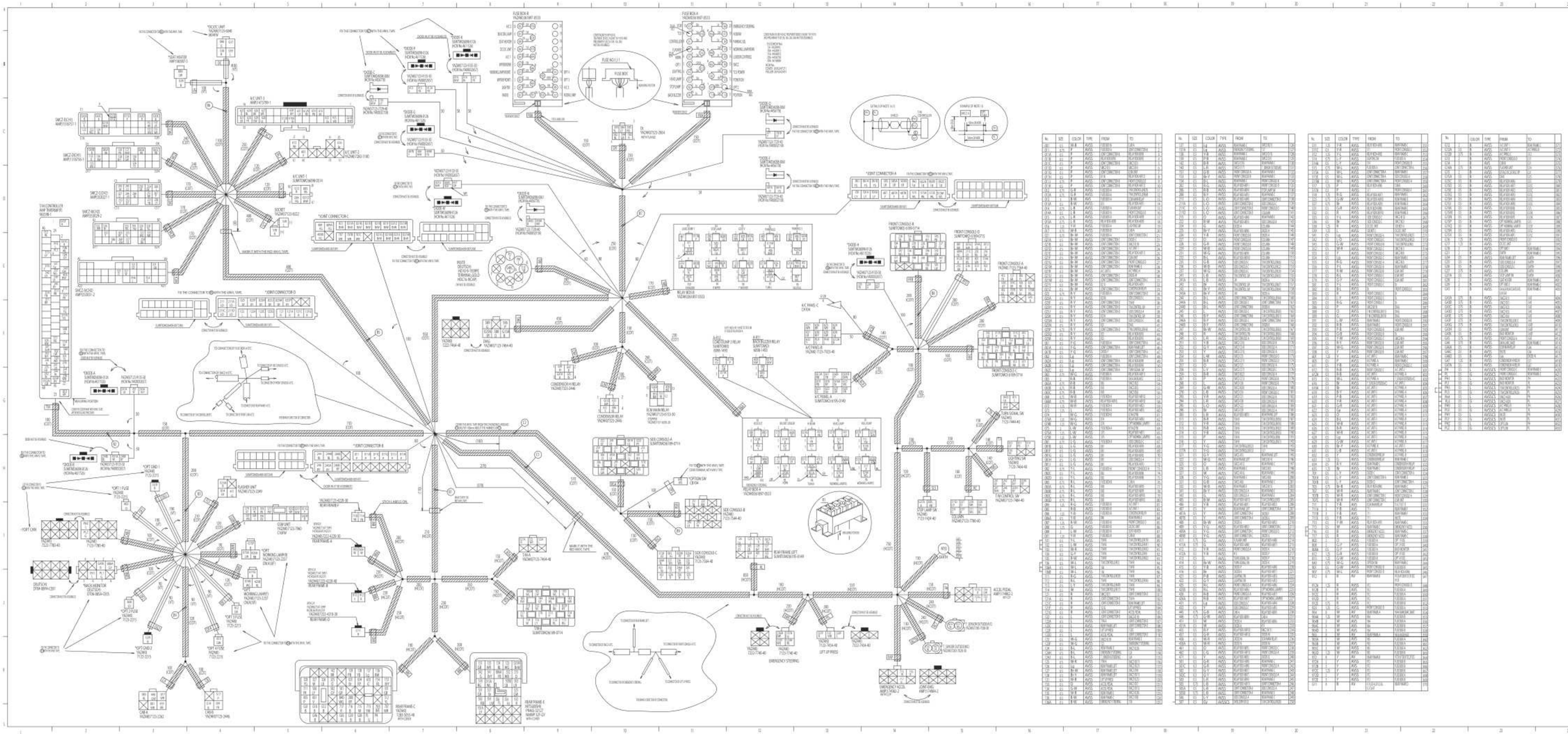
REAR CONSOLE HARNESS

Applicable Machine

Attach to vol. No	Model
TTNDJ-EN-00	ZW180-5A
TTNEJ-EN-00	ZW220-5A

⚠ CAUTION: Parts numbers on the drawing are provided only for reference purpose. To order parts on the drawing, be sure to consult the Parts Catalog.

The Attached Diagram	Technical manual
SMCZ	MC (Main Controller)
ICZ	Information Controller
MONITOR	Column Display Controller
A/C	Air Conditioner Controller UNIT



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