PART NO. TTNEK50-EN-00

HITACHI

Reliable solutions

Technical Manual

Troubleshooting

ZW

220-6

Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TONEK50-EN
Technical Manual (Troubleshooting)	: Vol. No.TTNEK50-EN
Workshop Manual	: Vol. No.WNEK50-EN

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Fault Code	Trouble	Cause	Behavior of TCU	Repair Procedure
5530-3	Abnormal Reverse Clutch Proportional Solenoid Valve High Voltage	Shorted circuit in harness or connector and power circuit. Faulty proportional solenoid valve.	Turn TCU to neutral. After returning the forward/reverse lever to neutral, operate it again. Then, machine can travel only at first or second speed. If other proportional solenoid valve is abnormal, TCU is fixed to neutral.	Check the harness between TCU and transmission control valve. Check the connector between TCU and transmission control valve. Check resistance in the proportional solenoid valve. (19 Ω at 20 °C (68 °F)) Check the internal harness in transmission control valve.
5530-4	Abnormal Reverse Clutch Proportional Solenoid Valve Low Voltage	Grounding to body because of faulty harness or faulty connector. Shorted circuit to other proportional solenoid valve output circuit in TCU because of faulty harness or faulty connector. Faulty proportional solenoid valve.	Turn TCU to neutral. After returning the forward/reverse lever to neutral, operate it again. Then, machine can travel only at first or second speed. If other proportional solenoid valve is abnormal, TCU is fixed to neutral.	Check the harness between TCU and transmission control valve. Check the connector between TCU and transmission control valve. Check resistance in the proportional solenoid valve. (19 Ω at 20 °C (68 °F)) Check the internal harness in transmission control valve.
5530-5	Open Circuit in Reverse Clutch Proportional Solenoid Valve	Faulty contact of harness, connector, and TCU. Faulty proportional solenoid valve.	Turn TCU to neutral. After returning the forward/reverse lever to neutral, operate it again. Then, machine can travel only at first or second speed. If other proportional solenoid valve is abnormal, TCU is fixed to neutral.	Check the harness between TCU and transmission control valve. Check the connector between TCU and transmission control valve. Check resistance in the proportional solenoid valve. (19 Ω at 20 °C (68 °F)) Check the internal harness in transmission control valve.

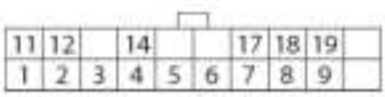
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Column Display Controller Fault Codes 120500 to 120505

Fault Code	Trouble	Procedure	Inspection Method	Evaluation	Cause
120500-2	Overheat Alarm	1	Disconnect a connector from the overheat switch. Retry by using MPDr.	Displayed fault code	YES: Faulty column display controller or short circuit in wire harness
					NO: Faulty overheat switch
120501-2	Engine Error	1	Diagnose on fault codes of ECM.	-	-
120502-2	Engine Oil Pressure Alarm	1	Diagnose on fault codes of ECM.	-	-
120503-2	Air Cleaner Restriction Alarm	1	Disconnect a connector from air filter restriction switch. Retry by using MPDr.	Displayed fault code	YES: Faulty column display controller or short circuit in wire harness
					NO: Faulty air cleaner restriction switch
120504-2	Hydraulic Oil Level Alarm	1	Disconnect a connector from the hydraulic oil level switch. Retry by using MPDr.	Displayed fault code	YES: Faulty column display controller or short circuit in wire harness
					NO: Faulty hydraulic oil level switch
120505-2	Brake Pressure Alarm	1	Disconnect a connector from the brake oil pressure switch. Retry by using MPDr.	Displayed fault code	YES: Faulty column display controller or short circuit in wire harness
					NO: Faulty brake oil pressure switch

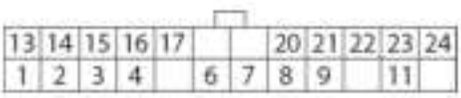
Connector (Wire harness end)

- Column Display Controller 1 Connector



TNEK-05-05-004

- Column Display Controller 2 Connector



TNEK-05-05-013

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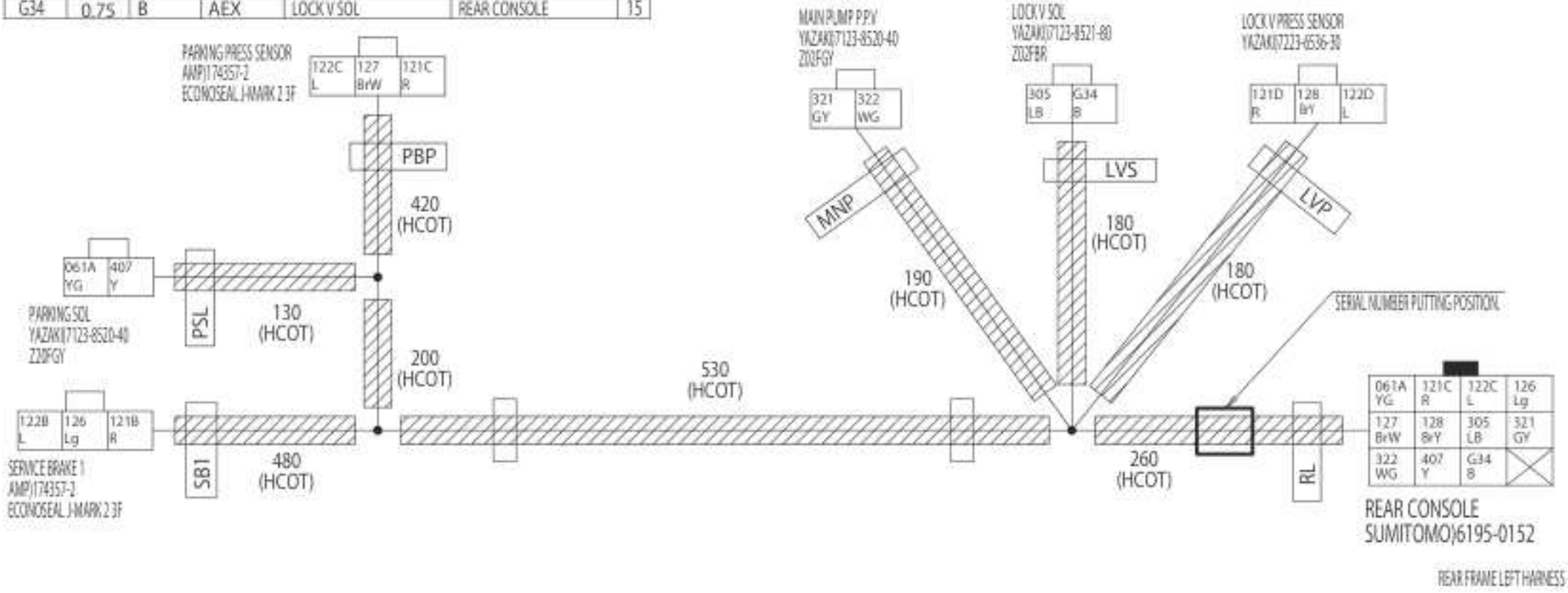
REAR FRAME LEFT HARNESS

Applicable Machine

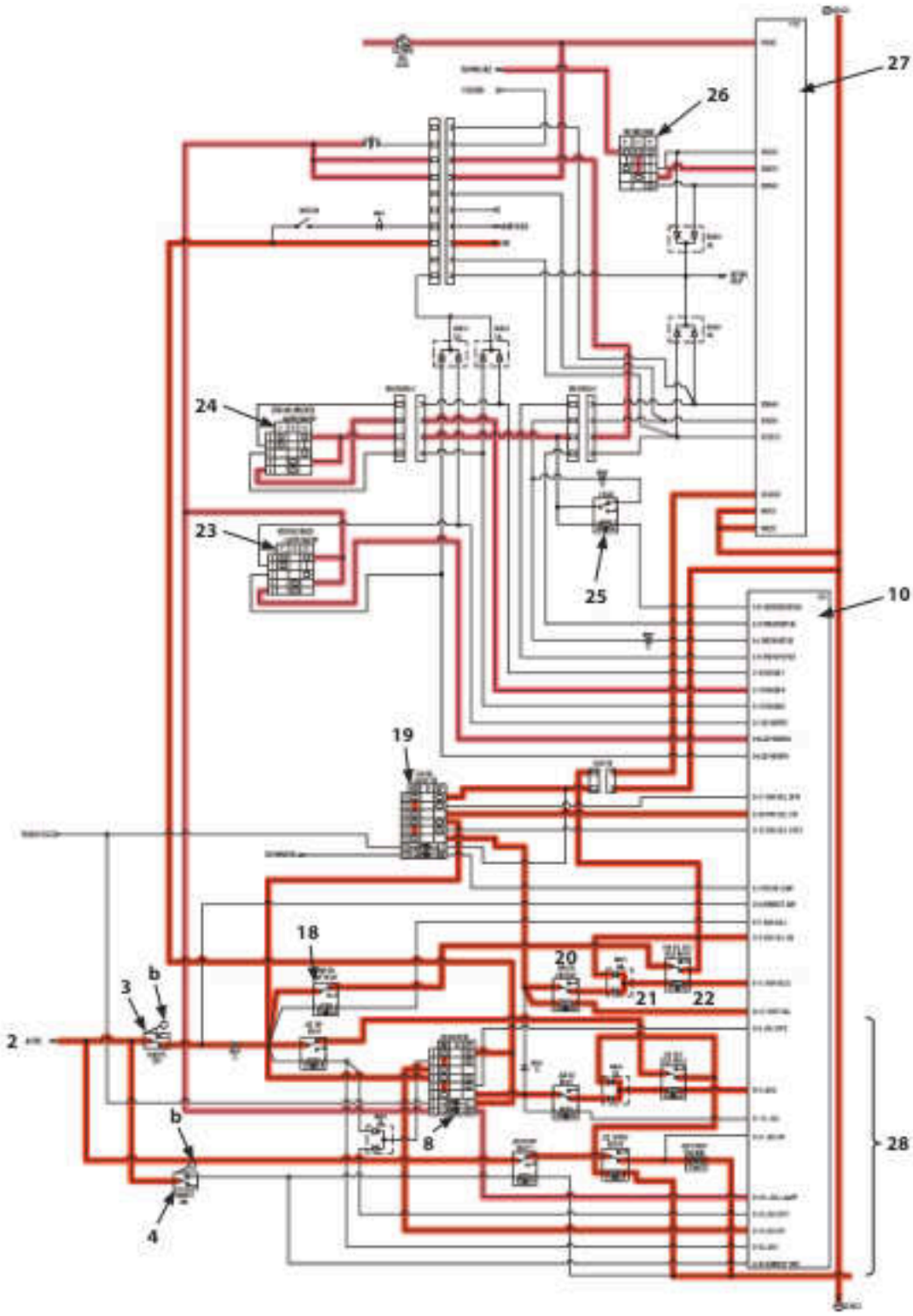
Attach to vol.No.	Model
TTNEK50-EN-00	ZW220-6
TTPD850-EN-01	ZW180-6/ZW180PL-6

⚠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.

No.	SIZE	COLOR	TYPE	FROM	TO	
061A	0.75	Y-G	AEX	REAR CONSOLE	PARKING SOL	1
121B	0.75	R	AEX	121C	SERVICE BRAKE 1	2
121C	0.75	R	AEX	REAR CONSOLE	PARKING PRESS SENSOR	3
121D	0.5	R	AESSX	121C	LOCK V PRESS SENSOR	4
122B	0.75	L	AEX	SERVICE BRAKE 1	122C	5
122C	0.75	L	AEX	PARKING PRESS SENSOR	REAR CONSOLE	6
122D	0.5	L	AESSX	LOCK V PRESS SENSOR	122C	7
126	0.75	Lg	AEX	SERVICE BRAKE 1	REAR CONSOLE	8
127	0.75	Br-W	AEX	PARKING PRESS SENSOR	REAR CONSOLE	9
128	0.5	Br-Y	AESSX	LOCK V PRESS SENSOR	REAR CONSOLE	10
305	0.75	L-B	AEX	REAR CONSOLE	LOCK V SOL	11
321	0.75	G-Y	AEX	REAR CONSOLE	MAIN PUMP P.P.V	12
322	0.75	W-G	AEX	MAIN PUMP P.P.V	REAR CONSOLE	13
407	0.75	Y	AEX	PARKING SOL	REAR CONSOLE	14
G34	0.75	B	AEX	LOCK V SOL	REAR CONSOLE	15



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TNEK-05-08-032

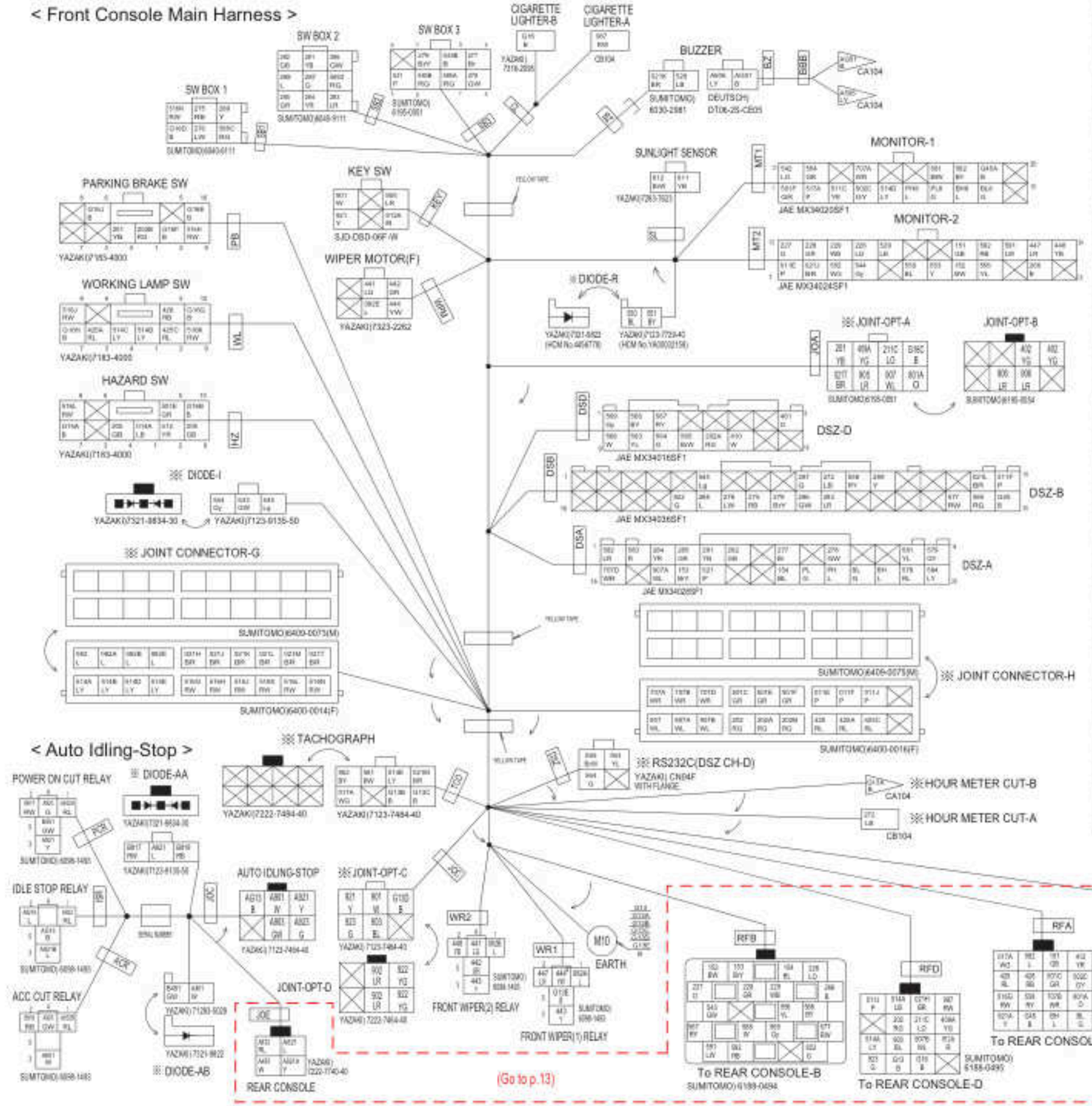
b- Left Console: Operation Position

2- Fuse #20 (Fuse Box A)
3- Armrest Switch 1
4- Armrest Switch 2
8- Joystick Steering Selector Switch
10- JCU
18- FNR OFF Relay
19- Forward/Reverse Selector Switch
20- FNR ON Relay
21- Diode C
22- FNR Hold Relay
23- Forward/Reverse Switch (Left)
24- Forward/Reverse Switch
25- N Relay
26- Forward/Reverse Lever
27- TCU
28- Joystick Steering Electrical Circuit

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70Z7B FRONT CONSOLE WIRING DIAGRAM

< Front Console Main Harness >



No.	SIZE	COLOR	FROM	TO
015E	0.5	P	JOINT CONNECTOR-H	MONITOR-2(1)
016F	0.5	P	JOINT CONNECTOR-H	DSZ-B(19)
011J	0.75	P	REAR CONSOLE-D	JOINT CONNECTOR-H
016A	0.5	L-B	REAR CONSOLE-D	HAZARD SW
017A	0.5	W-G	REAR CONSOLE-A	TACHOGRAPH
021H	0.5	B-R	REAR CONSOLE-D	JOINT CONNECTOR-G
021J	0.5	B-R	JOINT CONNECTOR-G	MONITOR-2(2)
027E	0.5	B-R	JOINT CONNECTOR-G	BUZZER(+)
027F	0.5	B-R	JOINT CONNECTOR-G	DSZ-B(17)
027M	0.5	B-R	JOINT CONNECTOR-G	TACHOGRAPH
027T	0.5	B-R	JOINT CONNECTOR-G	JOINT-OPT-A
062	0.75	L	REAR CONSOLE-A	JOINT CONNECTOR-G
063A	0.75	L	JOINT CONNECTOR-E	FRONT WIPER(2) RELAY
063B	0.75	L	JOINT CONNECTOR-G	FRONT WIPER(2) RELAY
063E	0.75	L	JOINT CONNECTOR-G	WIPER MOTOR(F)
067	1.25	R-W	REAR CONSOLE-D	CIGARETTE LIGHTER-B
101	0.5	G-R	MONITOR-2(20)	REAR CONSOLE-A
102	0.5	B-W	MONITOR-2(8)	REAR CONSOLE-B
103	0.5	Br-Y	DSZ-A(18)	REAR CONSOLE-D
104	0.5	B-L	REAR CONSOLE-B	DSZ-A(22)
201	0.5	Y-B	JOINT-OPT-A	PARKING BRAKE SW
202	0.5	R-G	REAR CONSOLE-D	JOINT CONNECTOR-H
202A	0.5	R-G	JOINT CONNECTOR-H	DSZ-D(13)
202B	0.5	R-G	JOINT CONNECTOR-H	PARKING BRAKE SW
203	0.5	G-B	HAZARD SW	REAR CONSOLE-D
217C	0.5	L-O	REAR CONSOLE-D	JOINT-OPT-A
220	0.5	L-O	MONITOR-2(16)	REAR CONSOLE-B
221	0.5	O	MONITOR-2(15)	REAR CONSOLE-B
228	0.5	G-R	MONITOR-2(14)	REAR CONSOLE-B
229	0.5	W-B	MONITOR-2(13)	REAR CONSOLE-B
260	0.5	B	MONITOR-2(1)(SELECT)	REAR CONSOLE-B
270	0.5	L-B	DSZ-B(11)	HOUR METER CUT-A
275	0.5	R-B	DSZ-B(26)	SW BOX 1
276	0.5	L-W	DSZ-B(25)	SW BOX 1
277	0.5	Br	DSZ-A(8)	SW BOX 1
278	0.5	G-W	DSZ-A(10)	SW BOX 1
279	0.5	Br-Y	DSZ-B(27)	SW BOX 2
281	0.5	Y-B	DSZ-A(5)	SW BOX 2
282	0.5	G-B	DSZ-A(9)	SW BOX 2
283	0.5	L-R	DSZ-B(29)	SW BOX 2
284	0.5	Y-R	DSZ-A(3)	SW BOX 2
285	0.5	G-R	DSZ-A(4)	SW BOX 2
286	0.5	G-W	DSZ-B(28)	SW BOX 2
287	0.5	O	DSZ-B(12)	SW BOX 2
288	0.5	L	DSZ-B(24)	SW BOX 1
289	0.5	Y	DSZ-B(13)	SW BOX 1
402	0.5	Y-G	JOINT-OPT-B	JOINT-OPT-B
409A	0.5	Y-O	REAR CONSOLE-D	JOINT-OPT-B
410	0.5	W	REAR CONSOLE-C	DSZ-B(14)
412	0.5	Y-R	HAZARD SW	REAR CONSOLE-A
425	0.5	R-L	JOINT CONNECTOR-H	REAR CONSOLE-A
429A	0.5	R-L	WORKING LAMP SW	JOINT CONNECTOR-H
429C	0.5	R-L	WORKING LAMP SW	JOINT CONNECTOR-H
429	0.5	R-B	WORKING LAMP SW	REAR CONSOLE-A
441	0.75	L-G	WIPER MOTOR(F)-L	FRONT WIPER(2) RELAY
442	0.75	G-R	WIPER MOTOR(F)-H	FRONT WIPER(2) RELAY
443	0.75	Y	FRONT WIPER(2) RELAY	FRONT WIPER(1) RELAY
444	0.75	Y-W	FRONT WIPER(1) RELAY	WIPER MOTOR(F)
447	0.5	L-R	FRONT WIPER(1) RELAY	MONITOR-2(23)
448	0.5	Y-B	FRONT WIPER(2) RELAY	MONITOR-2(24)
461	0.5	O	REAR CONSOLE-C	DSZ-D(1)
501C	0.5	G-R	REAR CONSOLE-A	JOINT CONNECTOR-H
501E	0.5	G-R	JOINT CONNECTOR-H	HAZARD SW
501F	0.5	G-R	JOINT CONNECTOR-H	MONITOR-1(1)
502C	0.5	G-Y	REAR CONSOLE-A	MONITOR-1(4)
502E	0.5	Y-R	REAR CONSOLE-C	MONITOR-1(3)
514A	0.5	L-Y	REAR CONSOLE-D	JOINT CONNECTOR-G
514B	0.5	L-Y	JOINT CONNECTOR-G	WORKING LAMP SW
514C	0.5	L-Y	514B	WORKING LAMP SW
514D	0.5	L-Y	JOINT CONNECTOR-E	MONITOR-1(5)
514E	0.5	L-Y	JOINT CONNECTOR-E	TACHOGRAPH
516D	0.5	R-W	REAR CONSOLE-A	JOINT CONNECTOR-G
516H	0.5	R-W	JOINT CONNECTOR-G	PARKING BRAKE SW
516J	0.5	R-W	JOINT CONNECTOR-G	WORKING LAMP SW
516K	0.5	R-W	JOINT CONNECTOR-G	WORKING LAMP SW
516L	0.5	R-W	JOINT CONNECTOR-G	HAZARD SW
516M	0.5	R-W	JOINT CONNECTOR-G	SW BOX 1
517A	0.5	P	REAR CONSOLE-E	MONITOR-1(2)
521	0.5	P	DSZ-A(15)	SW BOX 3
529	0.5	L-B	BUZZER(-)	MONITOR-2(17)

No.	SIZE	COLOR	FROM	TO
542	0.5	L-O	MONITOR-1(17)	REAR CONSOLE-C
543	0.5	G-W	DIODE-I	REAR CONSOLE-B
544	0.5	Gy	MONITOR-2(4)	DIODE-I
545	0.5	Lg	DSZ-B(5)	DIODE-I
550	0.5	B-L	DIODE-R	MONITOR-2(6)
551	0.5	B-Y	REAR CONSOLE-E	DIODE-R
552	0.5	W-G	MONITOR-2(2)	REAR CONSOLE-C
553	0.5	Y	MONITOR-2(7)	REAR CONSOLE-C
554	0.5	G-R	MONITOR-1(12)	REAR CONSOLE-C
555	0.5	Y-L	MONITOR-2(9)	REAR CONSOLE-B
559	0.5	R-Y	DSZ-B(12)	REAR CONSOLE-B
561	0.5	B-W	MONITOR-1(11)	TACHOGRAPH
562	0.5	B-Y	MONITOR-1(16)	TACHOGRAPH
563	0.5	Y-L	DSZ-B(10)	RS232C(DSZ CH-D)
564	0.5	G	DSZ-B(11)	RS232C(DSZ CH-D)
565	0.5	Br-W	DSZ-B(15)	RS232C(DSZ CH-D)
566	0.5	B-Y	REAR CONSOLE-B	DSZ-B(2)
567	0.5	R-Y	DSZ-B(3)	REAR CONSOLE-B
568	0.5	W	REAR CONSOLE-B	DSZ-B(9)
569	0.5	Gr	REAR CONSOLE-B	DSZ-B(1)
577	0.5	R-W	DSZ-B(16)	REAR CONSOLE-B
578	0.5	R-L	DSZ-B(7)	REAR CONSOLE-C
579	0.5	G-Y	DSZ-A(14)	REAR CONSOLE-C
581	0.5	Y-L	DSZ-A(13)	REAR CONSOLE-C
582	0.5	L-R	DSZ-A(1)	REAR CONSOLE-C
583	0.5	R	DSZ-A(2)	REAR CONSOLE-C
584	0.5	L-Y	DSZ-A(28)	REAR CONSOLE-C
585	0.5	R-G	REAR CONSOLE-E	DSZ-B(30)
585A	0.5	R-G	SW BOX 1	585
585B	0.5	R-G	SW BOX 1	585
585C	0.5	R-G	SW BOX 1	585
585D	0.5	R-G	SW BOX 2	585
591	0.5	L-W	REAR CONSOLE-B	MONITOR-2(22)
592	0.5	R-B	REAR CONSOLE-B	MONITOR-2(21)
611	0.5	Y-B	REAR CONSOLE-C	SUNLIGHT SENSOR
612	0.5	Br-W	SUNLIGHT SENSOR	REAR CONSOLE-C
703A	0.5	W-R	JOINT CONNECTOR-H	MONITOR-1(14)
703B	0.5	W-R	REAR CONSOLE-B	JOINT CONNECTOR-H
703D	0.5	W-R	JOINT CONNECTOR-H	DSZ-A(11)
801A	0.5	O	REAR CONSOLE-A	JOINT-OPT-A
802	0.5	G	DSZ-B(23)	REAR CONSOLE-B
901	0.5	W	KEY SW(ACC)	JOINT-OPT-E
902	0.5	L-R	JOINT-OPT-B	JOINT-OPT-E
903	0.5	B-L	JOINT-OPT-C	REAR CONSOLE-D
905	0.75	L-R	KEY SW(START)	JOINT-OPT-A
906	0.75	L-R	JOINT-OPT-B	JOINT-OPT-E
907	0.75	W-L	JOINT-OPT-A	JOINT CONNECTOR-H
907A	0.5	W-L	JOINT CONNECTOR-H	DSZ-A(17)
907B	0.75	W-L	JOINT CONNECTOR-E	REAR CONSOLE-E
910A	1.25	R	REAR CONSOLE-D	KEY SW(B)
911	1.25	Y	KEY SW(IG)	JOINT-OPT-E
921A	0.5	Y	B21	REAR CONSOLE-A
922	1.25	Y-G	JOINT-OPT-B	JOINT-OPT-D
923	1.25	O	JOINT-OPT-E	REAR CONSOLE-D
G01	2	B	EARTH	REAR CONSOLE-D
G15A	0.5	B	HOUR METER CUT-B	EARTH
G23B	0.5	B	TACHOGRAPH	EARTH
G31E	0.5	B	TACHOGRAPH	EARTH
G35B	0.5	B	JOINT-OPT-E	EARTH
G37E	0.75	B	FRONT WIPER(1) RELAY	EARTH
G41	1.25	B	CIGARETTE LIGHTER-B	REAR CONSOLE-D
G74A	0.5	B	HAZARD SW	G75
G74B	0.5	B	HAZARD SW	G75
G74C	0.5	B	JOINT-OPT-A	G75
G74D	0.5	B	SW BOX 1	G75
G74E	0.5	B	PARKING BRAKE SW	G75
G74F	0.5	B	PARKING BRAKE SW	G75
G74G	0.5	B	WORKING LAMP SW	G75
G74H	0.5	B	WORKING LAMP SW	G75
G74J	0.5	B	PARKING BRAKE SW	G75
G80	0.75	B	DSZ-A(16)	REAR CONSOLE-A
G85A	0.5	B	MONITOR-1(10)	G43
G85B	0.5	B	SW BOX 2	G43
RH	0.5	L	DSZ-A(20)	REAR CONSOLE-C
RL	0.5	G	DSZ-A(21)	REAR CONSOLE-C
RHB	0.5	L	RH	MONITOR-1(6)
RLB	0.5	G	RL	MONITOR-1(8)

< Auto Idling-Stop >

No.	SIZE	COLOR	FROM	TO
AM51	0.5	W	DIODE-AB	REAR CONSOLE
AM21	0.5	L	DIODE-AA	REAR CONSOLE
AM21A	0.5	L	A021	IDLE STOP RELAY
AM21B	0.5	L	A021	IDLE STOP RELAY
AM32	0.5	R-L	REAR CONSOLE	IDLE STOP RELAY
AM32A	0.5	R-L	A032	POWER ON CUT RELAY
AM32B	0.5	R-L	A032	ACC CUT RELAY
AM01	0.5	W	FRONT CONSOLE	ACC CUT RELAY
AM03	0.5	G-W	ACC CUT RELAY	FRONT CONSOLE
AM21	1.25	Y	FRONT CONSOLE	POWER ON CUT RELAY
AM21A	0.75	Y	A021	REAR CONSOLE
AM21	1.25	G	POWER ON CUT RELAY	FRONT CONSOLE
AM13	0.5	R	IDLE STOP RELAY	FRONT CONSOLE
BM51	0.5	G-W	POWER ON CUT RELAY	DIODE-AB
BM17	0.5	R-W	POWER ON CUT RELAY	DIODE-AA
BM16	0.5	R-B	ACC CUT RELAY	DIODE-AA

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