PART NO. TTNDB90-EN-00

HITACHI

Reliable solutions

Technical Manual

Troubleshooting

ZW

180-5B

180PL-5B

Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TONDB90-EN
Technical Manual (Troubleshooting)	: Vol. No.TTNDB90-EN
Workshop Manual	: Vol. No.WNDB90-EN

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SECTION 4

OPERATIONAL PERFORMANCE TEST

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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.

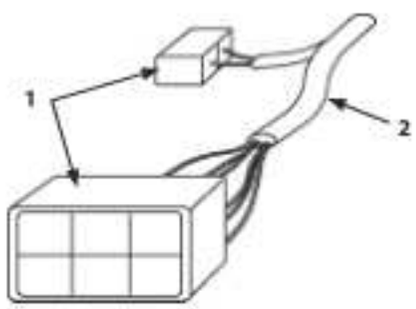
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Troubleshooting B (Machine Diagnosis by Using Troubleshooting Symptom) Procedure

Refer to troubleshooting B procedures for diagnosis by using trouble symptom when no fault codes are displayed.

- Diagnosis Procedure
  - The diagnosis procedures for the displayed fault codes are explained in this group.
  - Perform diagnosis by using MPDr. or the service menu of monitor first.
  - In case any fault code has not been displayed by diagnosis, perform inspection according to the procedures when diagnosing.
  - When the fault code is displayed, refer to the troubleshooting A group and diagnose.
  - On the front section pages of this group, there are the tables indicating the relationship between machine trouble symptoms and related parts which may cause such trouble if failed. Start the troubleshooting with more probable causes selected by referring to these tables.

NOTE: Harness end connector viewed from the open end side by the all connectors image shown in this section.



T6L4-05-03-001

1- Harness End Connector 2- Harness

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BEZEICHNUNG DER GESETZLICHEN EINHEITEN
DENOMINATION OF STANDARD DIMENSIONS
DENOMINATION DES DIMENSIONS STANDARDISEES

Hinweis : längenbezogene Maße in kg/m; flächenbezogene Maße in t/m2

Note : linear density in kg/m; areal density in t/m2

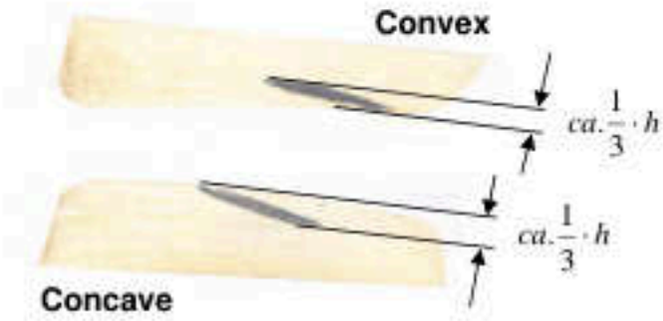
Nota : Densité linéaire en kg/m; Densité superficielle en t/m2

Begriff Unit Unité	Formelzeichen	neu New Nouveau	alt old Vieux	Umrechnung Conversion Conversion	Bemerkungen Note Nota
Masse Mass Mass	m	kg (Kilogramm)	kg		
Kraft Force Force	F	N (Newton)	kp	1 kp = 9,81 N	
Arbeit Work Travail	A	J (Joule)	kpm	0,102 kpm = 1J = 1 Nm	
Leistung Power Puissance	P	KW (Kilowatt)	PS (DIN)	1 PS = 0,7355 KW 1 KW = 1,36 PS	
Drehmoment Torque Couple	T	Nm (Newtonmeter)	kpm	1 kpm = 9,81 Nm	T (Nm) = F (N) . r (m)
Kraftmoment Moment (Force) Moment (Force)	M	Nm (Newtonmeter)	kpm	1 kpm = 9,81 Nm	M (Nm) = F (N) . r (m)
Druck (Über-) Pressure (Overpress) Pression (Sur-)	pü	bar	atü	1,02 atü = 1,02 kp/cm2 = 1 bar = 750 torr	
Drehzahl Speed Nombre de Tours	n	min -1			

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Example 3: "Line" contact pattern

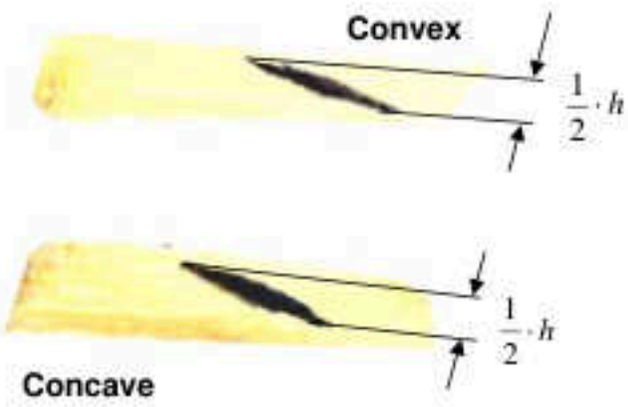
Contact pattern not o.k.



The contact pattern convex and concave is too far up on the crown wheel. The contact pattern is also too small and is not tangent to the flank middle line.
An adjustment is necessary!

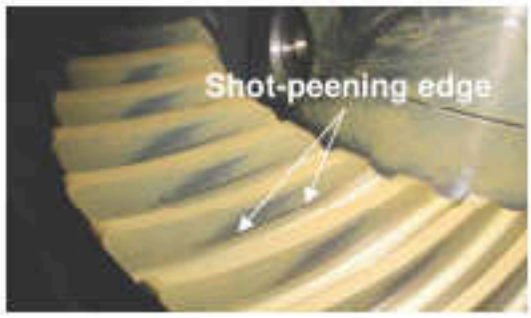
Adjustment: **Add a thicker pinion spacer!**

Contact pattern o.k.



The convex contact pattern must have an impression at the tooth middle line.
A minimum of 50% of the tooth depth (flank) is covered.

Note:
An edge on the root of the tooth is allowed, this is caused by the shot peening process (see example).



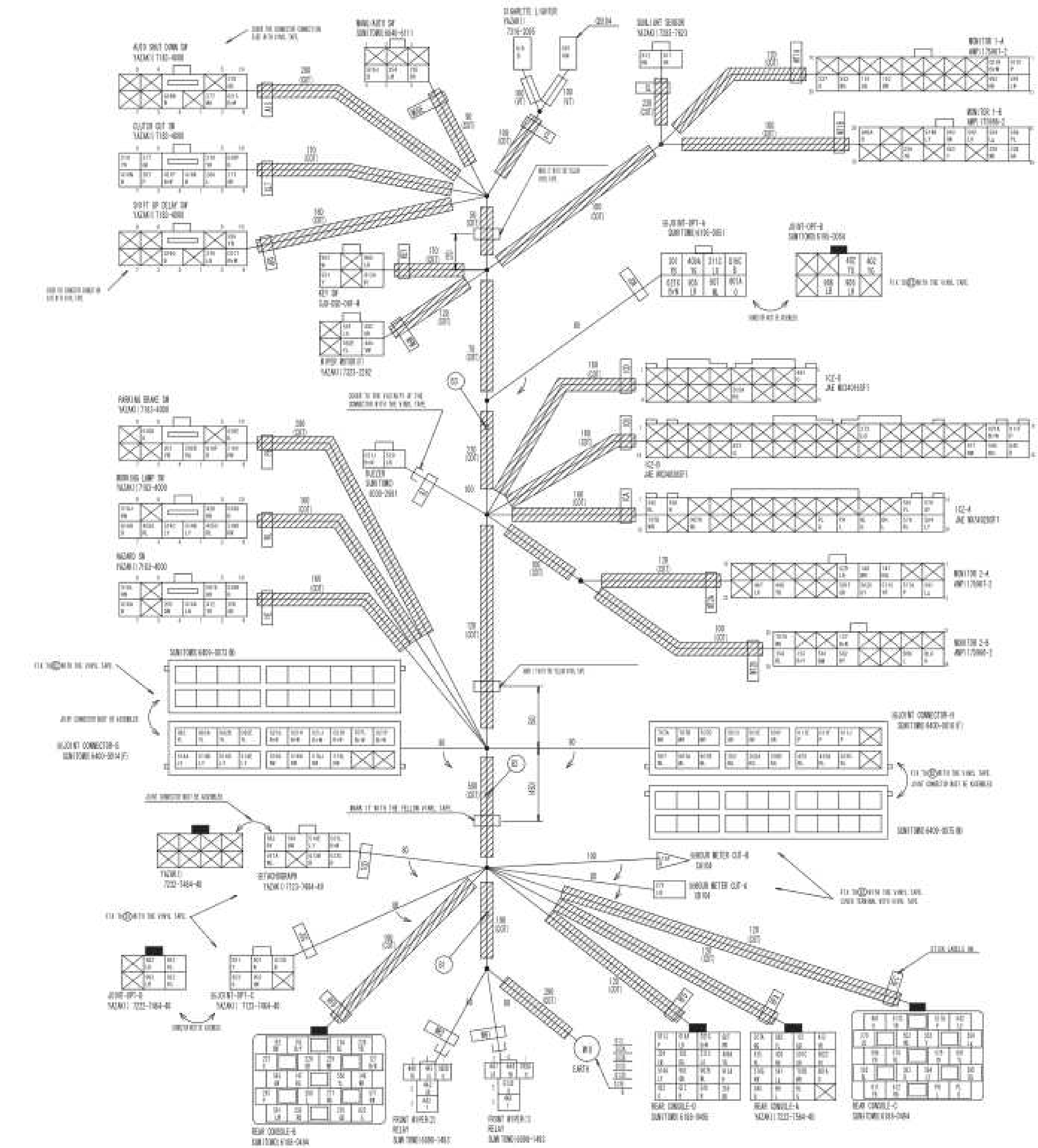
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Attach to Vol. No. : TTNDB-EN-00

ZW180-5B FRONT CONSOLE HARNES

⚠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)
T/M Controller	TCU
ICZ	Information Controller
MONITOR	Column Display Controller
A/C	Air Conditioner Controller



No.	SIZE	COLOR	TYPE	FROM	TO	
[illegible]	0.5	P	AVSS	JOINT CONNECTOR-H	MONITOR 1-A(1)	1
[illegible]	0.5	P	AVSS	JOINT CONNECTOR-H	ICZ-B([illegible])	2
[illegible]	0.75	P	AVSS	REAR CONSOLE-B	JOINT CONNECTOR-H	3
[illegible]	0.5	L-B	AVSS	REAR CONSOLE-B	HAZARD SW	4
[illegible]	0.5	W-G	AVSS	REAR CONSOLE-A	TACHOGRAPH	5
[illegible]	0.5	Br-W	AVSS	REAR CONSOLE-B	JOINT CONNECTOR-G	6
[illegible]	0.5	Br-W	AVSS	JOINT CONNECTOR-G	MONITOR 1-A([illegible])	7
[illegible]	0.5	Br-W	AVSS	JOINT CONNECTOR-G	BUZZER(1)	8
[illegible]	0.5	Br-W	AVSS	JOINT CONNECTOR-G	ICZ-B([illegible])	9
[illegible]	0.5	Br-W	AVSS	JOINT CONNECTOR-G	TACHOGRAPH	10
[illegible]	0.5	Br-W	AVSS	JOINT CONNECTOR-G	CLUTCH CUT SW	11
[illegible]	0.5	Br-W	AVSS	[illegible]	AUTO SHUT DOWN SW	12
[illegible]	0.5	Br-W	AVSS	[illegible]	SHIFT UP DELAY SW	13
[illegible]	0.5	Br-W	AVSS	[illegible]	JOINT-OPT-A	14
[illegible]	0.75	Y-L	AVSS	REAR CONSOLE-A	JOINT CONNECTOR-G	15
[illegible]	0.5	Y-L	AVSS	JOINT CONNECTOR-G	FRONT WIPER(1) RELAY	16
[illegible]	0.5	Y-L	AVSS	JOINT CONNECTOR-G	FRONT WIPER(2) RELAY	17
[illegible]	0.75	Y-L	AVSS	JOINT CONNECTOR-G	WIPER MOTOR([illegible])	18
[illegible]	1.25	R-W	AVSS	REAR CONSOLE-B	CIGARETTE LIGHTER-A	19
[illegible]	0.5	Br-W	AVSS	REAR CONSOLE-B	MONITOR 2-B([illegible])	20
[illegible]	0.5	R-G	AVSS	MONITOR 2-A([illegible])	REAR CONSOLE-B	21
[illegible]	0.5	W-R	AVSS	REAR CONSOLE-B	MONITOR 2-A([illegible])	22
[illegible]	0.3	G-B	AVSS	MONITOR 1-A([illegible])	REAR CONSOLE-A	23
[illegible]	0.3	B-W	AVSS	MONITOR 1-A([illegible])	REAR CONSOLE-B	24
[illegible]	0.5	Br-Y	AVSS	MONITOR 2-A([illegible])	REAR CONSOLE-B	25
[illegible]	0.5	B-L	AVSS	REAR CONSOLE-B	MONITOR 2-B([illegible])	26
[illegible]	0.5	Y-B	AVSS	JOINT-OPT-A	PARKING BRAKE SW	27
[illegible]	0.5	R-G	AVSS	REAR CONSOLE-B	JOINT CONNECTOR-H	28
[illegible]	0.5	R-G	AVSS	JOINT CONNECTOR-H	ICZ-B([illegible])	29
[illegible]	0.5	R-G	AVSS	JOINT CONNECTOR-H	PARKING BRAKE SW	30
[illegible]	0.3	G-B	AVSS	HAZARD SW	HAZARD SW	31
[illegible]	0.5	L-O	AVSS	REAR CONSOLE-B	JOINT-OPT-A	32
[illegible]	0.5	G-R	AVSS	CLUTCH CUT SW	CLUTCH CUT SW	33
[illegible]	0.5	Y-R	AVSS	CLUTCH CUT SW	CLUTCH CUT SW	34
[illegible]	0.5	Y-B	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-B	35
[illegible]	0.3	O	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-B	36
[illegible]	0.3	G-R	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-B	37
[illegible]	0.3	W-B	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-B	38
[illegible]	0.5	L-W	AVSS	REAR CONSOLE-B	MANU/AUTO SW	39
[illegible]	0.5	B-R	AVSS	REAR CONSOLE-B	MANU/AUTO SW	40
[illegible]	0.5	P	AVSS	REAR CONSOLE-B	CLUTCH CUT SW	41
[illegible]	0.5	L	AVSS	REAR CONSOLE-B	CLUTCH CUT SW	42
[illegible]	0.5	L-B	AVSS	REAR CONSOLE-C	SHIFT UP DELAY SW	43
[illegible]	0.5	L-B	AVSS	ICZ-B([illegible])	HOUR METER CUT-A	44
[illegible]	0.5	W-G	AVSS	REAR CONSOLE-B	AUTO SHUT DOWN SW	45
[illegible]	0.5	G-B	AVSS	AUTO SHUT DOWN SW	REAR CONSOLE-B	46
[illegible]	0.5	Y-G	AVSS	JOINT-OPT-B	JOINT-OPT-B	47
[illegible]	0.5	Y-G	AVSS	REAR CONSOLE-B	JOINT-OPT-A	48
[illegible]	0.5	Y-R	AVSS	HAZARD SW	REAR CONSOLE-A	49
[illegible]	0.5	R-L	AVSS	JOINT CONNECTOR-H	REAR CONSOLE-A	50
[illegible]	0.5	R-L	AVSS	WORKING LAMP SW	JOINT CONNECTOR-H	51
[illegible]	0.5	R-L	AVSS	WORKING LAMP SW	JOINT CONNECTOR-H	52
[illegible]	0.5	R-B	AVSS	WORKING LAMP SW	REAR CONSOLE-A	53
[illegible]	0.75	L-B	AVSS	WIPER MOTOR([illegible])	FRONT WIPER(2) RELAY	54
[illegible]	0.75	G-R	AVSS	WIPER MOTOR([illegible])	FRONT WIPER(1) RELAY	55
[illegible]	0.75	Y	AVSS	FRONT WIPER(1) RELAY	FRONT WIPER(2) RELAY	56
[illegible]	0.75	Y-W	AVSS	FRONT WIPER(1) RELAY	WIPER MOTOR([illegible])	57
[illegible]	0.5	L-W	AVSS	FRONT WIPER(1) RELAY	MONITOR 2-A([illegible])	58
[illegible]	0.5	Y-B	AVSS	FRONT WIPER(2) RELAY	MONITOR 2-A([illegible])	59
[illegible]	0.5	O	AVSS	REAR CONSOLE-C	ICZ-B([illegible])	60
[illegible]	0.3	G-R	AVSS	REAR CONSOLE-A	JOINT CONNECTOR-H	61
[illegible]	0.3	G-R	AVSS	JOINT CONNECTOR-H	HAZARD SW	62
[illegible]	0.3	G-R	AVSS	JOINT CONNECTOR-H	MONITOR 1-A([illegible])	63
[illegible]	0.3	G-Y	AVSS	REAR CONSOLE-A	MONITOR 1-A([illegible])	64
[illegible]	0.3	Y-R	AVSS	REAR CONSOLE-C	MONITOR 1-A([illegible])	65
[illegible]	0.5	L-Y	AVSS	REAR CONSOLE-B	JOINT CONNECTOR-G	66
[illegible]	0.5	L-Y	AVSS	JOINT CONNECTOR-G	WORKING LAMP SW	67
[illegible]	0.5	L-Y	AVSS	[illegible]	WORKING LAMP SW	68
[illegible]	0.3	L-Y	AVSS	JOINT CONNECTOR-G	MONITOR 1-B([illegible])	69
[illegible]	0.5	L-Y	AVSS	JOINT CONNECTOR-G	TACHOGRAPH	70
[illegible]	0.5	R-W	AVSS	REAR CONSOLE-A	JOINT CONNECTOR-H	71
[illegible]	0.3	R-W	AVSS	JOINT CONNECTOR-G	PARKING BRAKE SW	72
[illegible]	0.3	R-W	AVSS	JOINT CONNECTOR-G	WORKING LAMP SW	73
[illegible]	0.3	R-W	AVSS	[illegible]	WORKING LAMP SW	74
[illegible]	0.3	R-W	AVSS	JOINT CONNECTOR-G	HAZARD SW	75

No.	SIZE	COLOR	TYPE	FROM	TO	
[illegible]	0.3	P	AVSS	REAR CONSOLE-C	MONITOR 2-A([illegible])	76
[illegible]	0.5	L-B	AVSS	BUZZER([illegible])	MONITOR 2-A([illegible])	77
[illegible]	0.3	Lg	AVSS	MONITOR 2-A([illegible])	REAR CONSOLE-A	78
[illegible]	0.5	L-O	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-C	79
[illegible]	0.3	G-W	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-B	80
[illegible]	0.5	W-G	AVSS	MONITOR 1-A([illegible])	REAR CONSOLE-C	81
[illegible]	0.3	Y	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-C	82
[illegible]	0.5	Lg	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-C	83
[illegible]	0.3	Y-L	AVSS	MONITOR 1-B([illegible])	REAR CONSOLE-B	84
[illegible]	0.5	B-W	AVSS	MONITOR 2-B([illegible])	TACHOGRAPH	85
[illegible]	0.5	B-Y	AVSS	MONITOR 2-B([illegible])	TACHOGRAPH	86
[illegible]	0.5	R-W	AVSS	ICZ-B([illegible])	REAR CONSOLE-B	87
[illegible]	0.5	R-L	AVSS	ICZ-A([illegible])	REAR CONSOLE-C	88
[illegible]	0.5	G-Y	AVSS	ICZ-A([illegible])	REAR CONSOLE-C	89
[illegible]	0.5	Y-L	AVSS	ICZ-A([illegible])	REAR CONSOLE-C	90
[illegible]	0.5	B-L	AVSS	REAR CONSOLE-C	ICZ-A([illegible])	91
[illegible]	0.5	W	AVSS	ICZ-A([illegible])	REAR CONSOLE-C	92
[illegible]	0.5	L-Y	AVSS	ICZ-A([illegible])	REAR CONSOLE-C	93
[illegible]	0.5	R-G	AVSS	ICZ-B([illegible])	REAR CONSOLE-C	94
[illegible]	0.5	L-W	AVSS	REAR CONSOLE-B	MONITOR 1-A([illegible])	95
[illegible]	0.5	W-B	AVSS	REAR CONSOLE-B	MONITOR 1-A([illegible])	96
[illegible]	0.5	Y-R	AVSS	SHIFT UP DELAY SW	REAR CONSOLE-C	97
[illegible]	0.5	Y-B	AVSS	REAR CONSOLE-C	SUNLIGHT SENSOR	98
[illegible]	0.5	R-B	AVSS	SUNLIGHT SENSOR	REAR CONSOLE-C	99
[illegible]	0.3	W-R	AVSS	JOINT CONNECTOR-H	MONITOR 2-B([illegible])	100
[illegible]	0.3	W-R	AVSS	REAR CONSOLE-A	JOINT CONNECTOR-H	101
[illegible]	0.3	W-R	AVSS	JOINT CONNECTOR-H	ICZ-B([illegible])	102
[illegible]	0.5	G	AVSS	REAR CONSOLE-A	JOINT-OPT-A	103
[illegible]	0.5	G	AVSS	ICZ-B([illegible])	REAR CONSOLE-B	104
[illegible]	0.5	W	AVSS	KEY SW(ACC)	JOINT-OPT-C	105
[illegible]	0.5	L-R	AVSS	JOINT-OPT-B	JOINT-OPT-B	106
[illegible]	0.5	G-W	AVSS	JOINT-OPT-C	REAR CONSOLE-D	107
[illegible]	0.75	L-R	AVSS	KEY SW(START)	JOINT-OPT-A	108
[illegible]	0.75	L-R	AVSS	JOINT-OPT-B	JOINT-OPT-B	109
[illegible]	0.75	W-L	AVSS	JOINT-OPT-A	JOINT CONNECTOR-H	110
[illegible]	0.5	W-L	AVSS	JOINT CONNECTOR-H	ICZ-A([illegible])	111
[illegible]	0.75	W-L	AVSS	JOINT CONNECTOR-H	REAR CONSOLE-D	112
[illegible]	1.25	R	AVSS	REAR CONSOLE-D	KEY SW(B)	113
[illegible]	1.25	Y	AVSS	KEY SW(M)	JOINT-OPT-C	114
[illegible]	1.25	Y-G	AVSS	JOINT-OPT-B	JOINT-OPT-B	115
[illegible]	1.25	G	AVSS	JOINT-OPT-C	REAR CONSOLE-D	116
[illegible]	2	B	AVSS	EARTH	REAR CONSOLE-D	117
[illegible]	0.5	B	AVSS	HOUR METER CUT-B	EARTH	118
[illegible]	0.5	B	AVSS	TACHOGRAPH	EARTH	119
[illegible]	0.5	B	AVSS	TACHOGRAPH	EARTH	120
[illegible]	0.5	B	AVSS	JOINT-OPT-C	EARTH	121
[illegible]	0.75	B	AVSS	FRONT WIPER(1) RELAY	EARTH	122
[illegible]	1.25	B	AVSS	CIGARETTE LIGHTER-B	REAR CONSOLE-D	123
[illegible]	0.5	B	AVSS	HAZARD SW	[illegible]	124
[illegible]	0.5	B	AVSS	HAZARD SW	[illegible]	125
[illegible]	0.5	B	AVSS	JOINT-OPT-A	[illegible]	126
[illegible]	0.5	B	AVSS	PARKING BRAKE SW	[illegible]	127
[illegible]	0.5	B	AVSS	PARKING BRAKE SW	[illegible]	128
[illegible]	0.5	B	AVSS	PARKING BRAKE SW	[illegible]	129
[illegible]	0.5	B	AVSS	WORKING LAMP SW	[illegible]	130
[illegible]	0.5	B	AVSS	WORKING LAMP SW	[illegible]	131
[illegible]	0.5	B	AVSS	MANU/AUTO SW	[illegible]	132
[illegible]	0.5	B	AVSS	CLUTCH CUT SW	[illegible]	133
[illegible]	0.5	B	AVSS	AUTO SHUT DOWN SW	[illegible]	134
[illegible]	0.5	B	AVSS	CLUTCH CUT SW	[illegible]	135
[illegible]	0.5	B	AVSS	CLUTCH CUT SW	[illegible]	136
[illegible]	0.5	B	AVSS	SHIFT UP DELAY SW	[illegible]	137
[illegible]	0.75	B	AVSS	ICZ-B([illegible])	REAR CONSOLE-D	138
[illegible]	0.5	B	AVSS	MONITOR 1-B([illegible])	[illegible]	139
[illegible]	0.5	L	AVSSCS	ICZ-A([illegible])	REAR CONSOLE-C	140
[illegible]	0.5	B	AVSSCS	ICZ-A([illegible])	REAR CONSOLE-C	141
[illegible]	0.5	L	AVSSCS	ICZ-A([illegible])	REAR CONSOLE-A	142
[illegible]	0.5	B	AVSSCS	ICZ-A([illegible])	REAR CONSOLE-A	143
[illegible]	0.5	L	AVSSCS	[illegible]	MONITOR 2-B([illegible])	144
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