PART NO. TONEC-EN-00

HITACHI

Reliable solutions

Technical Manual

Operational Principle

ZW

250-5B

Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TONEC-EN
Technical Manual (Troubleshooting)	: Vol. No.TTNEC-EN
Workshop Manual	: Vol. No.WNEC-EN
Engine Manual	: Vol. No.ETDDD-EN, EWDDD-EN

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BATTERY	Type	160F51
	Voltage	12 V
	Capacity	108 Ah (5-Hour Rate)
	Weight	34 kg (75 lb)×2

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Engine Torque Idle Speed-Up Control

Purpose:
In case the engine speed is slow and the engine load increases while the machine climbs on a slope, the engine torque idle speed-up control increases the engine speed in order to prevent engine stall.

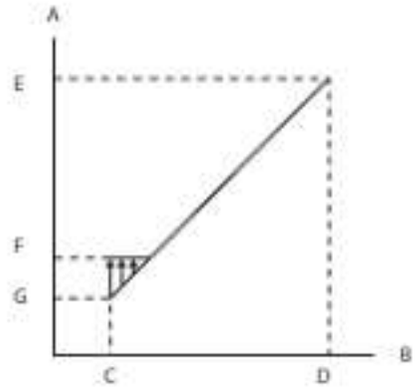
Operation:

1. ECM (10) sends the engine torque signals to MC (3) by using CAN communication (5).
2. When all following conditions exist, MC (3) sends the signals equivalent to the target engine speed to ECM (10) by using CAN communication (5).
3. ECM (10) increases the engine speed to engine torque idle speed-up speed (F) when it is slower than engine torque idle speed-up speed (Max. 1100 min^{-1}) (F).

Conditions:

- Forward/Reverse Lever (23): Operated
- Vehicle Speed: 20 km/h (12 mph) or less
- Accelerator Pedal (1) Depressing Amount: Lightly (Engine Speed: 1100 min^{-1} or less)
- Engine Torque: Beyond specified value (Reference: 20 % or more)

NOTE: Engine torque idle speed-up control is activated by the signal of forward/reverse switch (27) in case of the machine with forward/reverse switch (27) attached.

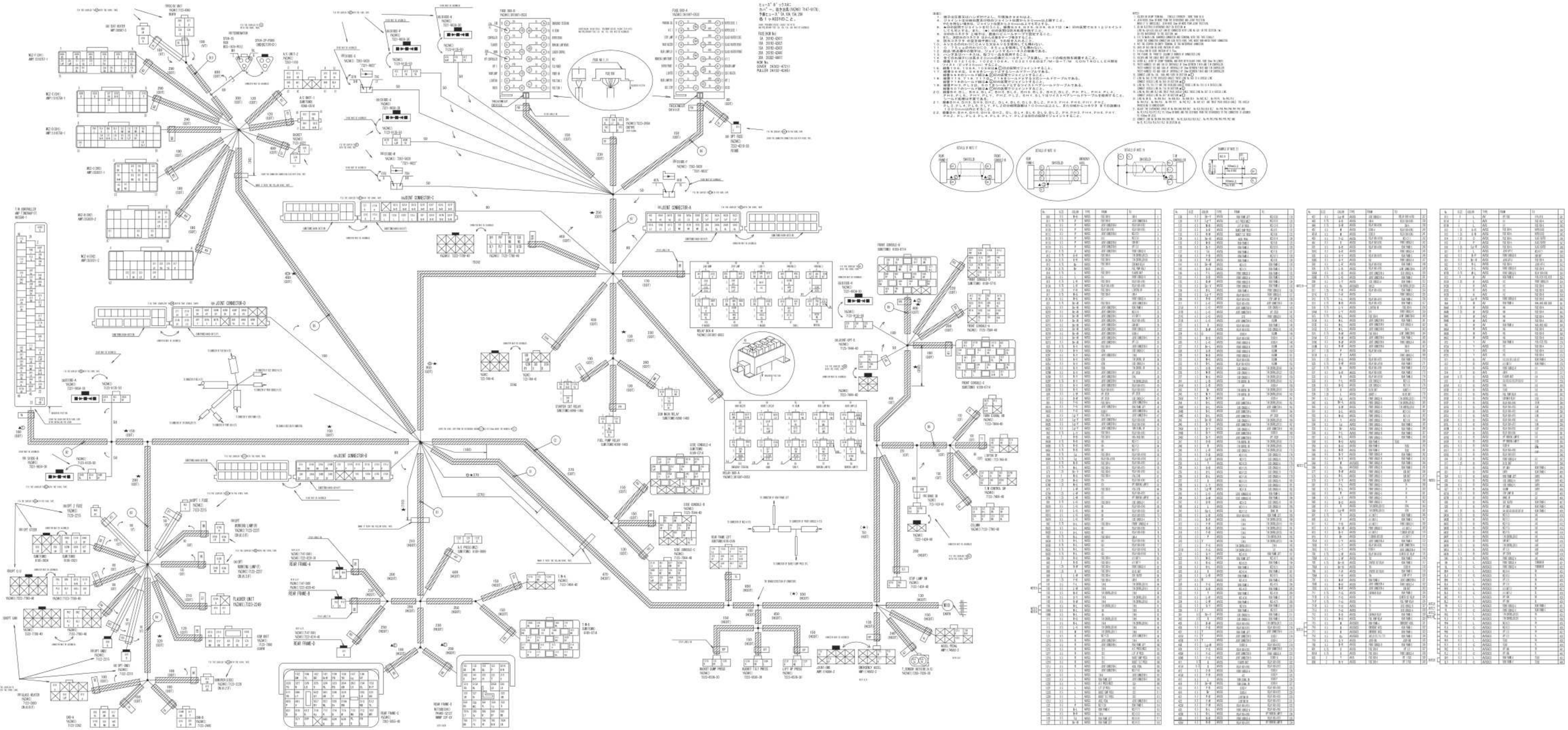


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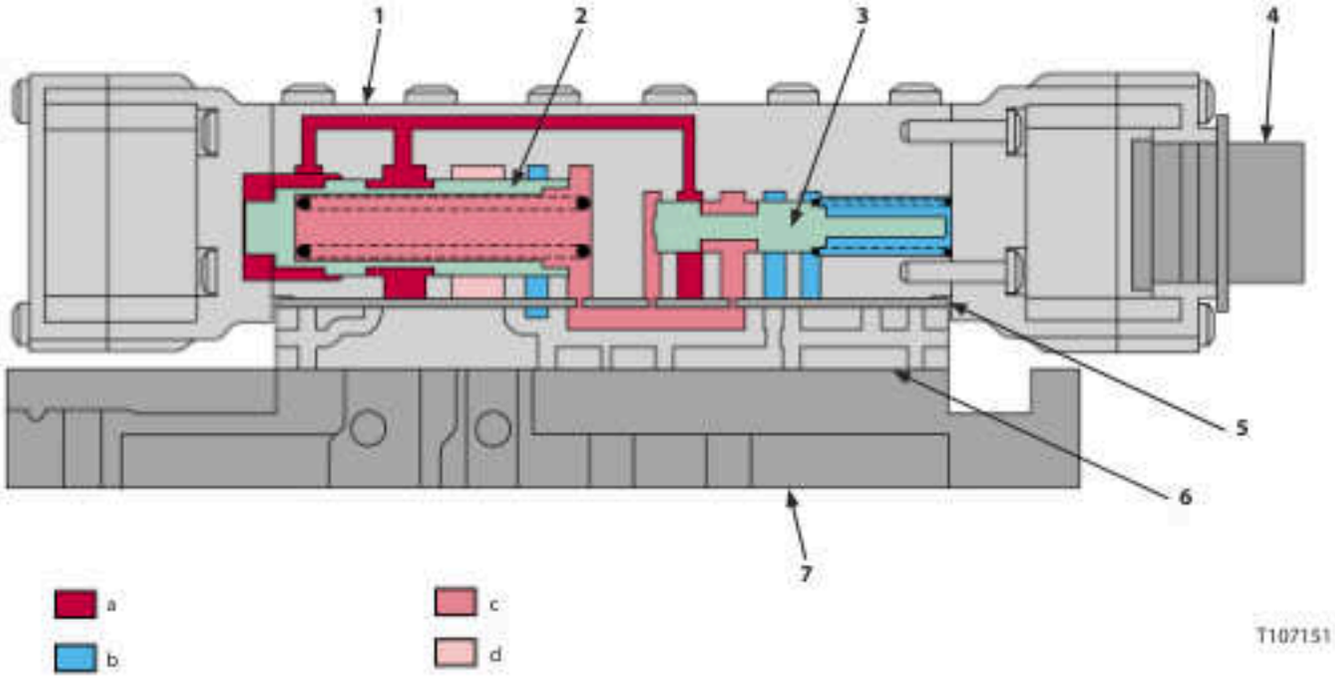
A - Engine Speed
B - Accelerator Pedal Depressing Amount
C - Accelerator Pedal Depressing Amount: Not depressed
D - Accelerator Pedal Depressing Amount: Fully depressed
E - Fast Idle Speed (2350 min^{-1})
F - Engine Torque Idle Speed-Up Speed (Max. 1100 min^{-1})
G - Slow Idle Speed (800 min^{-1})

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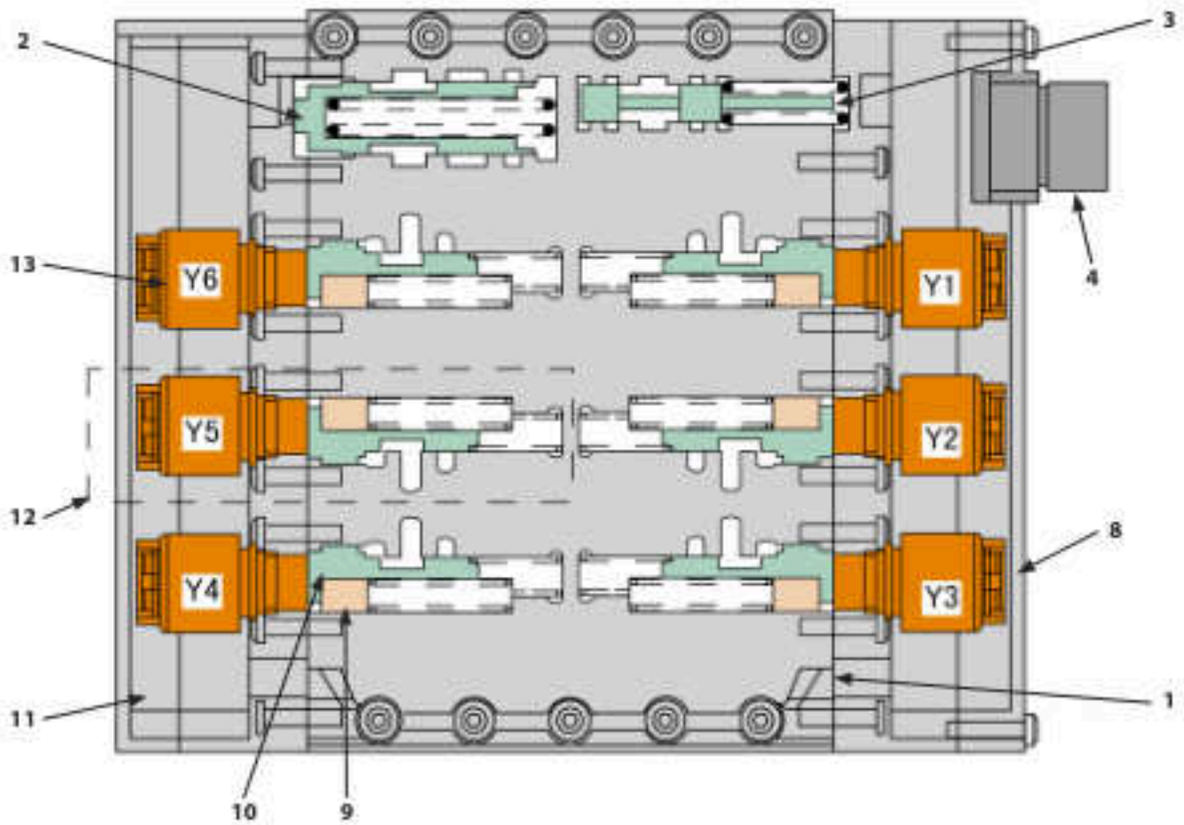
ZW250-5B REAR CONSOLE HARNESS



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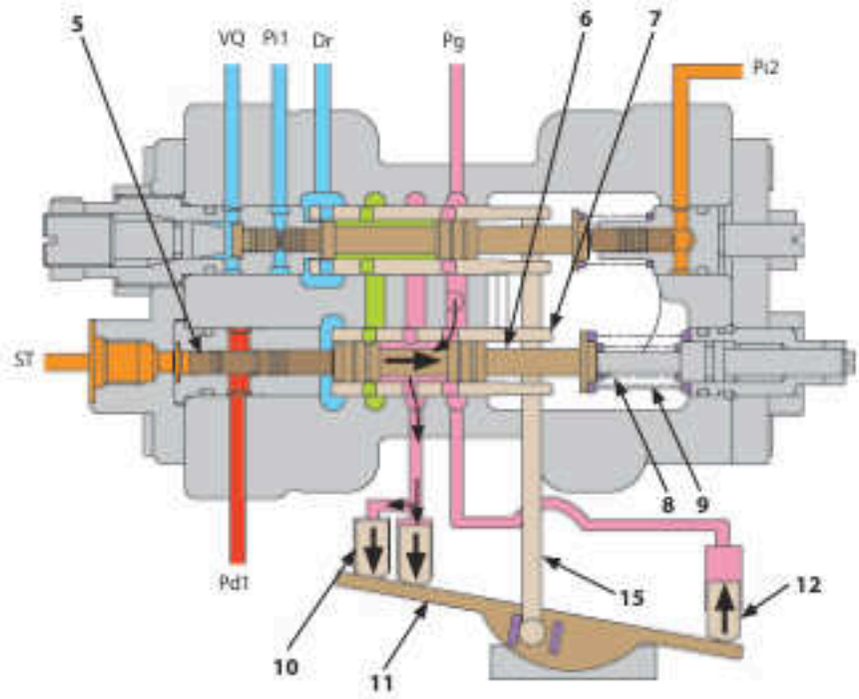


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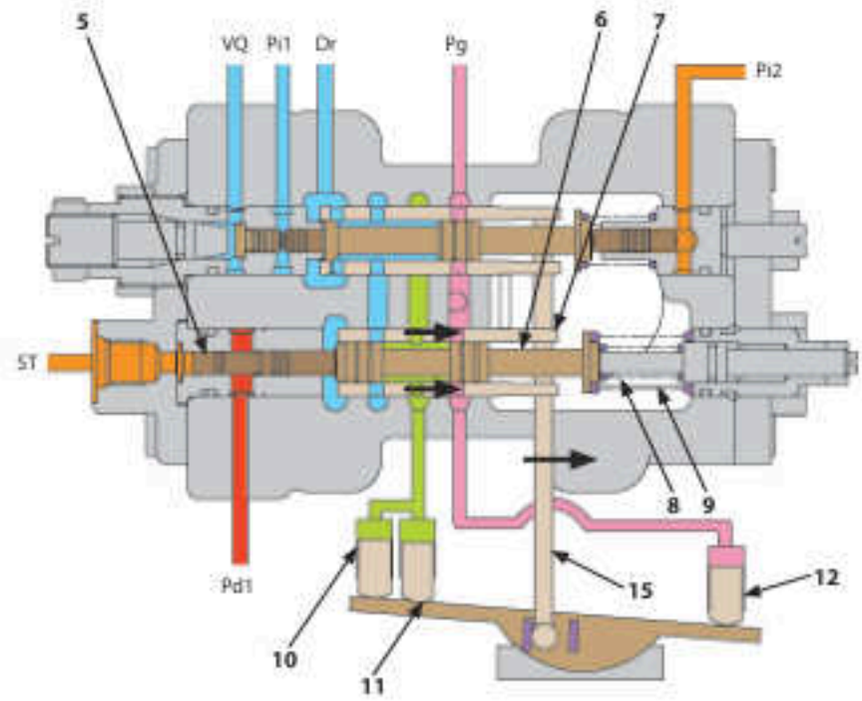
a- System Main Pressure Oil
b- Returning Oil
c- Reduced Pressure Oil
d- Converter Pressure Oil

1- Valve Body
2- Pressure Control Valve
3- Pressure Reducing Valve
4- Connector
5- Middle Plate
6- Channel Plate
7- Plate
8- Cover
9- Damper Valve
10- Spool
11- Housing
12- Modulation Circuit
13- Proportional Solenoid Valve

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TNED-03-01-020

Pd1- Own Pump Delivery Pressure
ST- Torque Control Pressure

Dr- Returning to Hydraulic Oil Tank
Pi1- Pump Control Pressure 1

Pi2- Pump Control Pressure 2
Pg- Primary Pilot Pressure (From Pilot Pump)

VQ- Bucket Dump Pilot Pressure

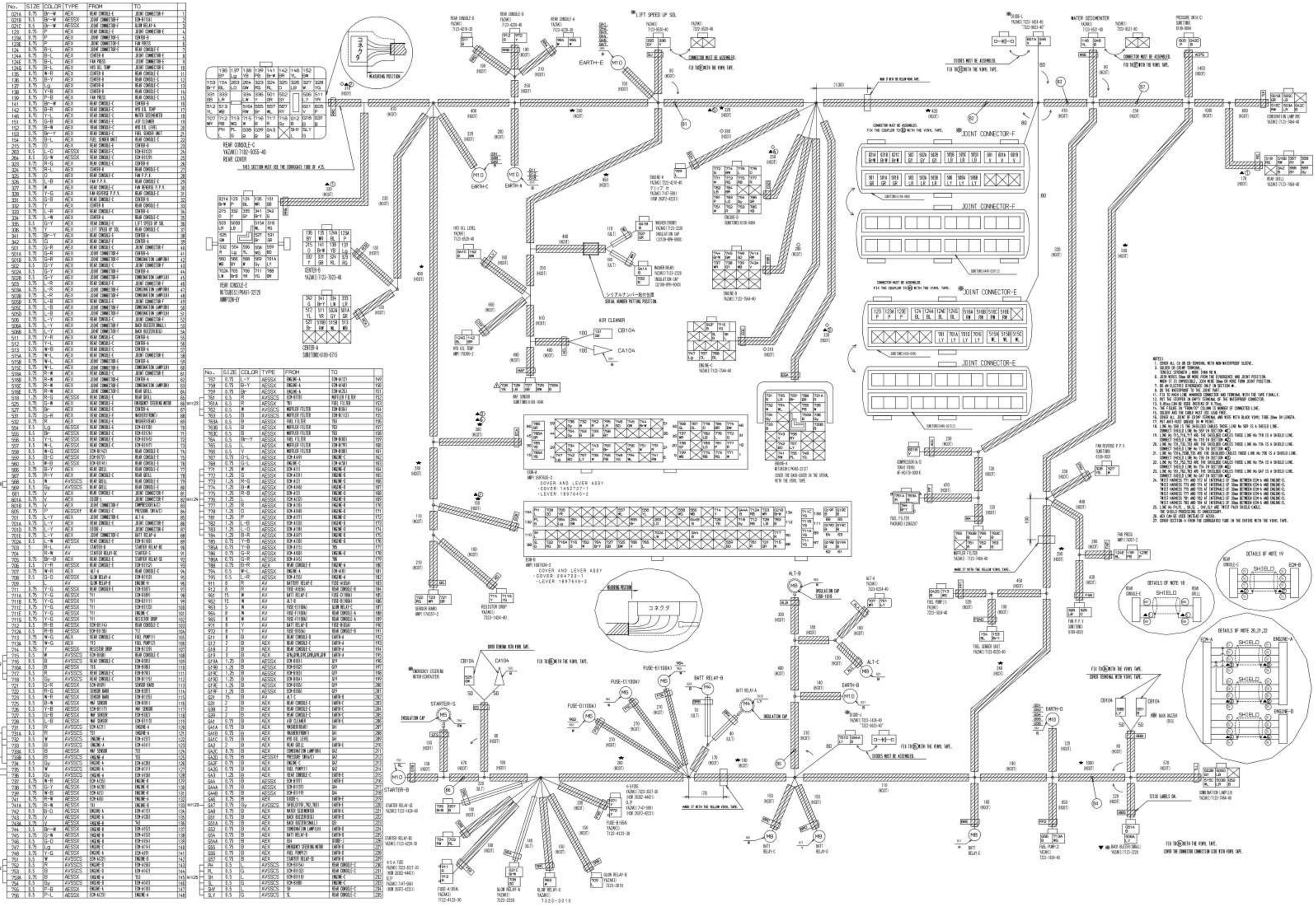
5- Load Piston
6- Spool 2
7- Sleeve 2

8- Inner Spring
9- Outer Spring
10- Servo Piston 1

11- Swash Plate
12- Servo Piston 2
15- Feedback Lever Link

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ZW250-5B REAR FRAME HARNESS



No.	SIZE	COLOR	TYPE	FROM	TO	
021A	0.75	BY-W	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	1
021B	0.5	BY-W	AESSX	JOINT CONNECTOR-F	ECM-B(12)	2
021C	0.5	BY-W	AESSX	JOINT CONNECTOR-F	ECM-B(14)	3
123	0.75	P	AEX	REAR CONSOLE-E	JOINT CONNECTOR-E	4
123A	0.75	P	AEX	JOINT CONNECTOR-E	CENTER-B	5
123E	0.75	P	AEX	JOINT CONNECTOR-F	FAN PRESS	6
124	0.75	B-L	AEX	JOINT CONNECTOR-F	REAR CONSOLE-E	7
124A	0.75	B-L	AEX	CENTER-B	JOINT CONNECTOR-F	8
124E	0.75	B-L	AEX	FAN PRESS	JOINT CONNECTOR-F	9
124S	0.75	B-L	AEX	H/O OIL TEMP	JOINT CONNECTOR-F	10
135	0.75	W-R	AEX	CENTER-B	REAR CONSOLE-E	11
136	0.75	B-Y	AEX	CENTER-B	REAR CONSOLE-E	12
137	0.75	Lg	AEX	CENTER-B	REAR CONSOLE-E	13
138	0.75	Y-B	AEX	CENTER-B	REAR CONSOLE-E	14
139	0.75	P-B	AEX	FAN PRESS	REAR CONSOLE-E	15
141	0.75	BY-W	AEX	REAR CONSOLE-C	CENTER-B	16
142	0.75	B-R	AEX	REAR CONSOLE-C	H/O OIL TEMP	17
146	0.75	Y-L	AEX	REAR CONSOLE-C	WATER SEDIMENTER	18
151	0.75	G-B	AEX	REAR CONSOLE-E	AIR CLEANER	19
152	0.75	B-W	AEX	REAR CONSOLE-C	H/O OIL LEVEL	20
153	0.75	BY-Y	AEX	REAR CONSOLE-C	FUEL SENDER UNIT	21
154	0.75	B-L	AEX	FUEL SENDER UNIT	REAR CONSOLE-E	22
215	0.75	O	AEX	REAR CONSOLE-E	CENTER-B	23
263	0.5	L-O	AESSX	REAR CONSOLE-C	ECM-B(12)	24
264	0.5	G-W	AESSX	REAR CONSOLE-C	ECM-B(29)	25
323	0.75	R-G	AEX	REAR CONSOLE-C	CENTER-B	26
324	0.75	R-L	AEX	CENTER-B	REAR CONSOLE-E	27
325	0.75	O	AEX	REAR CONSOLE-E	FAN P.P.V.	28
326	0.75	L-B	AEX	FAN P.P.V.	REAR CONSOLE-E	29
327	0.75	#	AEX	REAR CONSOLE-E	FAN REVERSE P.P.V.	30
328	0.75	Y-G	AEX	FAN REVERSE P.P.V.	REAR CONSOLE-E	31
331	0.75	G-B	AEX	REAR CONSOLE-E	CENTER-B	32
332	0.75	Y	AEX	CENTER-B	REAR CONSOLE-E	33
333	0.75	L-R	AEX	REAR CONSOLE-E	CENTER-A	34
334	0.75	L-W	AEX	CENTER-B	REAR CONSOLE-E	35
335	0.5	G-Y	AEX	REAR CONSOLE-E	LIFT SPEED UP SOL	36
336	0.75	Y	AEX	LIFT SPEED UP SOL	REAR CONSOLE-E	37
341	0.75	BY-Y	AEX	REAR CONSOLE-E	CENTER-A	38
342	0.75	G	AEX	REAR CONSOLE-E	CENTER-A	39
501	0.5	G-R	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	40
501A	0.5	G-R	AEX	JOINT CONNECTOR-F	CENTER-A	41
501B	0.75	G-R	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(RH)	42
502	0.5	G-Y	AEX	REAR CONSOLE-C	JOINT CONNECTOR-F	43
502A	0.5	G-Y	AEX	JOINT CONNECTOR-F	CENTER-A	44
502B	0.5	G-Y	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(LH)	45
503	0.75	L-R	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	46
503A	0.75	L-R	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(RH)	47
503B	0.75	L-R	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(LH)	48
505B	0.75	L-B	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	49
505C	0.75	L-B	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(RH)	50
505D	0.75	L-B	AEX	JOINT CONNECTOR-F	COMBINATION LAMP(LH)	51
506	0.75	L-Y	AEX	REAR CONSOLE-C	JOINT CONNECTOR-F	52
506A	0.75	L-Y	AEX	JOINT CONNECTOR-F	BACK BUZZER(SMALL)	53
506B	0.75	L-Y	AEX	JOINT CONNECTOR-F	BACK BUZZER(BIG)	54
511	0.75	Y-R	AEX	REAR CONSOLE-C	CENTER-A	55
512	0.75	Y-L	AEX	REAR CONSOLE-E	CENTER-A	56
513	0.75	W-B	AEX	REAR CONSOLE-E	CENTER-A	57
515A	0.75	W-L	AEX	REAR CONSOLE-E	JOINT CONNECTOR-E	58
515B	0.75	W-L	AEX	JOINT CONNECTOR-E	CENTER-A	59
515C	0.75	W-L	AEX	JOINT CONNECTOR-E	COMBINATION LAMP(LH)	60
516A	0.75	R-W	AEX	REAR CONSOLE-E	JOINT CONNECTOR-E	61
516B	0.75	R-W	AEX	JOINT CONNECTOR-E	COMBINATION LAMP(RH)	62
516C	0.75	R-W	AEX	JOINT CONNECTOR-E	COMBINATION LAMP(LH)	63
516E	0.75	R-W	AEX	JOINT CONNECTOR-E	REAR GRILL	64
518	1.25	R-G	AESSX	REAR CONSOLE-E	REAR GRILL	65
525	0.75	G-W	AEX	REAR CONSOLE-E	EMERGENCY STEERING MOTOR	66
527	0.75	BR	AEX	CENTER-A	REAR CONSOLE-E	67
531	0.75	G-R	AEX	REAR CONSOLE-E	WASHER(REAR)	68
532	0.75	R	AEX	REAR CONSOLE-E	WASHER(REAR)	69
554	0.5	Lg	AESSX	REAR CONSOLE-E	ECM-B(13)	70
555	0.5	BR	AESSX	REAR CONSOLE-E	ECM-B(27)	71
556	0.5	Y-L	AESSX	REAR CONSOLE-C	ECM-B(15)	72
557	0.5	W-L	AESSX	REAR CONSOLE-C	ECM-B(17)	73
558	0.5	W-G	AESSX	REAR CONSOLE-E	ECM-B(30)	74
559	0.5	B-O	AESSX	ECM-B(20)	REAR CONSOLE-E	75
560	0.5	W-B	AESSX	ECM-B(16)	REAR CONSOLE-E	76
566	0.75	BY-W	AEX	REAR CONSOLE-E	REAR GRILL	77
567	0.75	R-Y	AEX	REAR CONSOLE-E	REAR GRILL	78
568	0.5	W	AVSSCS	REAR GRILL	REAR CONSOLE-E	79
569	0.5	Gy	AVSSCS	REAR GRILL	REAR CONSOLE-E	80
601	0.75	V	AEX	REAR CONSOLE-E	JOINT CONNECTOR-F	81
601A	0.75	V	AEX	CENTER-A	JOINT CONNECTOR-F	82
601B	0.75	V	AEX	JOINT CONNECTOR-F	COMPRESSOR(A/C)	83
605	0.75	P	AESSXT	REAR CONSOLE-C	PRESSURE SW(A/C)	84
701	0.75	L-Y	AEX	JOINT CONNECTOR-E	ALT-B	85
701A	0.75	L-Y	AEX	REAR CONSOLE-E	JOINT CONNECTOR-E	86
701B	0.75	L-Y	AEX	CENTER-J	JOINT CONNECTOR-E	87
701E	0.75	L-Y	AEX	JOINT CONNECTOR-E	BATT RELAY-B	88
702A	0.5	L-W	AESSX	REAR CONSOLE-E	ECM-B(28)	89
703	5	R-L	AV	STARTER-B	STARTER RELAY-BE	90
704	5	W-W	AV	STARTER RELAY-BE	STARTER-S	91
705	0.75	BY-B	AEX	REAR CONSOLE-E	STARTER RELAY-SE	92
706	0.5	Y-R	AESSX	REAR CONSOLE-E	ECM-B(32)	93
707	0.75	W-R	AEX	ALT-B	REAR CONSOLE-E	94
708	0.5	G-O	AESSX	GLOW RELAY-A	ECM-B(33)	95
709	5	L	AV	GLOW RELAY-B	ENGINE-H	96
711	0.75	Y-G	AESSX	REAR CONSOLE-E	ECM-B(31)	97
711A	0.75	Y-G	AESSX	711	ECM-B(9)	98
711B	0.75	Y-G	AESSX	711	ECM-B(11)	99
711C	0.75	Y-G	AESSX	711	ECM-B(33)	100
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712	0.5	R-B	AESSX	ECM-B(14)	REAR CONSOLE-E	103
712A	0.5	R-B	AESSX	ECM-B(13)	712	104
713	0.75	W-G	AEX	REAR CONSOLE-C	FUEL PUMP(1)	105
713A	0.75	W-G	AEX	713	FUEL PUMP(2)	106
714	0.75	Y	AESSX	RESISTOR DROP	ECM-B(29)	107
715	0.5	W	AESSCS	ECM-B(18)	REAR CONSOLE-C	108
716	0.5	B	AESSCS	REAR CONSOLE-C	ECM-B(35)	109
716A	0.5	B	AESSX	715	ECM-B(36)	110
717	0.5	R	AESSCS	REAR CONSOLE-C	ECM-B(34)	111
718	0.5	Gy	AESSCS	REAR CONSOLE-C	ECM-B(37)	112
721	0.5	G-R	AESSX	SENSOR BARO	ECM-B(31)	113
722	0.5	R-G	AESSX	SENSOR BARO	ECM-B(31)	114
723	0.5	W-R	AESSX	SENSOR BARO	ECM-B(35)	115
725	0.5	B-W	AESSX	MAF SENSOR	ECM-B(11)	116
726	0.5	Y-B	AESSX	MAF SENSOR	ECM-B(17)	117
727	0.5	G-B	AESSX	MAF SENSOR	ECM-B(37)	118
728	0.5	L-W	AESSX	MAF SENSOR	ECM-B(31)	119
731	0.5	R	AVSSCS	ECM-A(21)	ENGINE-A	120
731A	0.5	R	AVSSCS	731	ENGINE-A	121
732	0.5	W	AVSSCS	ENGINE-A	ECM-A(31)	122
733	0.5	B	AVSSCS	ENGINE-A	ECM-A(11)	123
733A	0.5	B	AESSX	MAF SENSOR	733	124
733B	0.5	B	AVSSCS	ENGINE-A	733	125
734	0.5	Gy	AVSSCS	ENGINE-A	ECM-A(29)	126
735	0.5	W	AVSSCS	ENGINE-A	ECM-A(11)	127
736	0.5	Gy	AVSSCS	ENGINE-A	ECM-A(18)	128
737	0.75	W-R	AEX	ENGINE-A	ENGINE-B	129
738	0.75	G-Y	AEX	ENGINE-A	ENGINE-B	130
739	0.75	W-B	AEX	ENGINE-A	ENGINE-B	131
741	0.75	R-W	AEX	ECM-A(6)	ENGINE-A	132
741A	0.75	R-W	AEX	741	ENGINE-B	133
742	0.5	B-O	AESSX	ENGINE-A	ECM-A(12)	134
743	0.75	V	AEX	ENGINE-A	ECM-A(30)	135
743A	0.75	V	AEX	ENGINE-A	743	136
744	0.5	Br-W	AESSX	ENGINE-B	ECM-A(32)	137
745	0.75	G-W	AEX	ENGINE-B	ECM-A(32)	138
746	0.5	G-O	AESSX	ENGINE-B	ECM-A(34)	139
747	0.75	Lg	AEX	ENGINE-B	ECM-A(14)	140
748	0.75	Y-G	AEX	ENGINE-B	ECM-A(19)	141
751	0.5	W	AVSSCS	ECM-A(20)	ENGINE-B	142
752	0.5	R	AESSX	ENGINE-B	ECM-A(36)	143
753	0.5	G	AESSX	ENGINE-B	ECM-A(42)	144
753A	0.75	B	AESSX	ENGINE-C	753	145
754	0.5	Gy	AESSX	ENGINE-B	ECM-A(33)	146
755	0.5	P-B	AESSX	ENGINE-B	ECM-A(38)	147
756	0.5	P-L	AESSX	ECM-A(39)	ENGINE-A	148

No.	SIZE	COLOR	TYPE	FROM	TO	
757	0.75	L-Y	AESSX	ENGINE-A	ECM-A(37)	149
758	0.75	B-Y	AESSX	ENGINE-A	ECM-A(40)	150
759	0.75	Br	AESSX	ENGINE-A	ECM-A(25)	151
761	0.5	R	AVSSCS	ECM-B(19)	MUFFLER F.P. SW	152
761A	0.5	R	AESSX	761	FUEL FILTER	153
762	0.5	B	AESSX	MUFFLER FILTER	ECM-B(24)	154
763	0.5	B	AVSSCS	MUFFLER FILTER	ECM-B(10)	155
763A	0.5	B	AESSX	FUEL FILTER	763	156
763B	0.5	B	AESSX	MUFFLER FILTER	763	157
763C	0.5	B	AESSX	MUFFLER FILTER	763	158
765A	0.5	B	AESSX	MUFFLER FILTER	763	159
765	0.5	L	AESSX	MUFFLER FILTER	ECM-B(26)	160
765A	0.5	L	AESSX	MUFFLER FILTER	ECM-B(38)	161
767	0.75	O-L	AESSX	ECM-A(41)	ENGINE-C	162
768	0.75	O-L	AESSX	ENGINE-C	ECM-A(31)	163
771	1.25	R	AESSX	ENGINE-A	ENGINE-B	164
772	1.25	S	AESSX	ECM-A(13)	ENGINE-B	165
773	1.25	R-G	AESSX	ECM-A(2)	ENGINE-C	166
774	1.25	B-W	AESSX	ECM-A(46)	ENGINE-B	167
775	1.25	R-B	AESSX	ECM-A(23)	ENGINE-B	168
776	1.25	W	AESSX	ECM-A(35)	ENGINE-B	169
777	1.25	R	AESSX	ECM-A(16)	ENGINE-B	170
778	1.25	O	AESSX	ECM-A(48)	ENGINE-B	171
781	1.25	P	AESSX	ECM-A(17)	ENGINE-B	172
782	1.25	L-R	AESSX	ECM-A(33)	ENGINE-B	173
783	1.25	L-O	AESSX	ECM-A(18)	ENGINE-B	174
784	1.25	B-R	AESSX	ECM-A(47)	ENGINE-B	175
785	0.75	Y-B	AESSX	ECM-A(30)	ENGINE-B	176
785A	0.75	Y-W	AESSX	ECM-A(15)	785	177
786	0.75	G-R	AESSX	ECM-A(49)	ENGINE-B	178
786A	0.75	G-R	AESSX	ECM-A(45)	786	179
788	0.75	BR	AEX	REAR CONSOLE-E	ENGINE-A	180
794	0.5	W-L	AESSX	ENGINE-A	ECM-A(8)	181
795	0.5	L-R	AESSX	ECM-A(50)	ENGINE-A	182
911	8	R	AV	BATTERY RELAY-E	FUSE-M(95A)	183
912	8	R	AV	FUSE-M(95A)	REAR CONSOLE-B	184
961	15	W	AV	BATT RELAY-E	FUSE-C(100A)	185
962	15	W	AV	ALT-B	FUSE-D(100A)	186
963	5	W	AV	FUSE-E(100A)	GLOW RELAY-C	187
964	8	W	AV	FUSE-E(100A)	REAR CONSOLE-A	188
965	8	W	AV	FUSE-E(100A)	REAR CONSOLE-A	189
971	8	Y	AV	BATT RELAY-B	FUSE-B(60A)	190
972	8	Y	AV	FUSE-B(60A)	REAR CONSOLE-B	191
G11	8	B	AV	REAR CONSOLE-B	EARTH-A	192
G12	2	B	AEX	REAR CONSOLE-C	EARTH-A	193
G18	2	B	AEX	REAR CONSOLE-C	EARTH-A	194
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