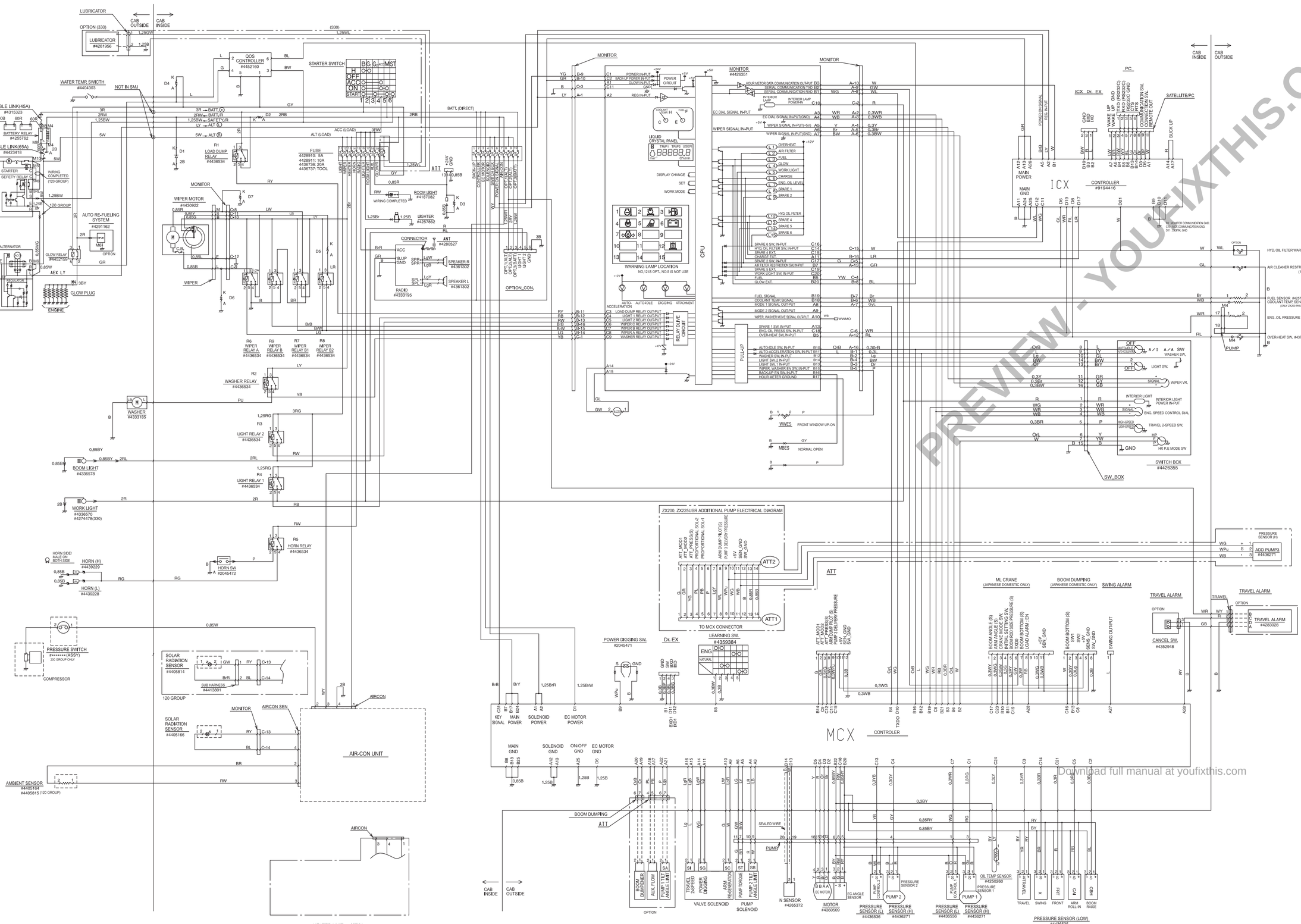
Attach to Vol. No. : TT1F1E-02

ZAXIS 160LC/180LC/180LCN ELECTRICAL CIRCUIT DIAGRAM

⚠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.



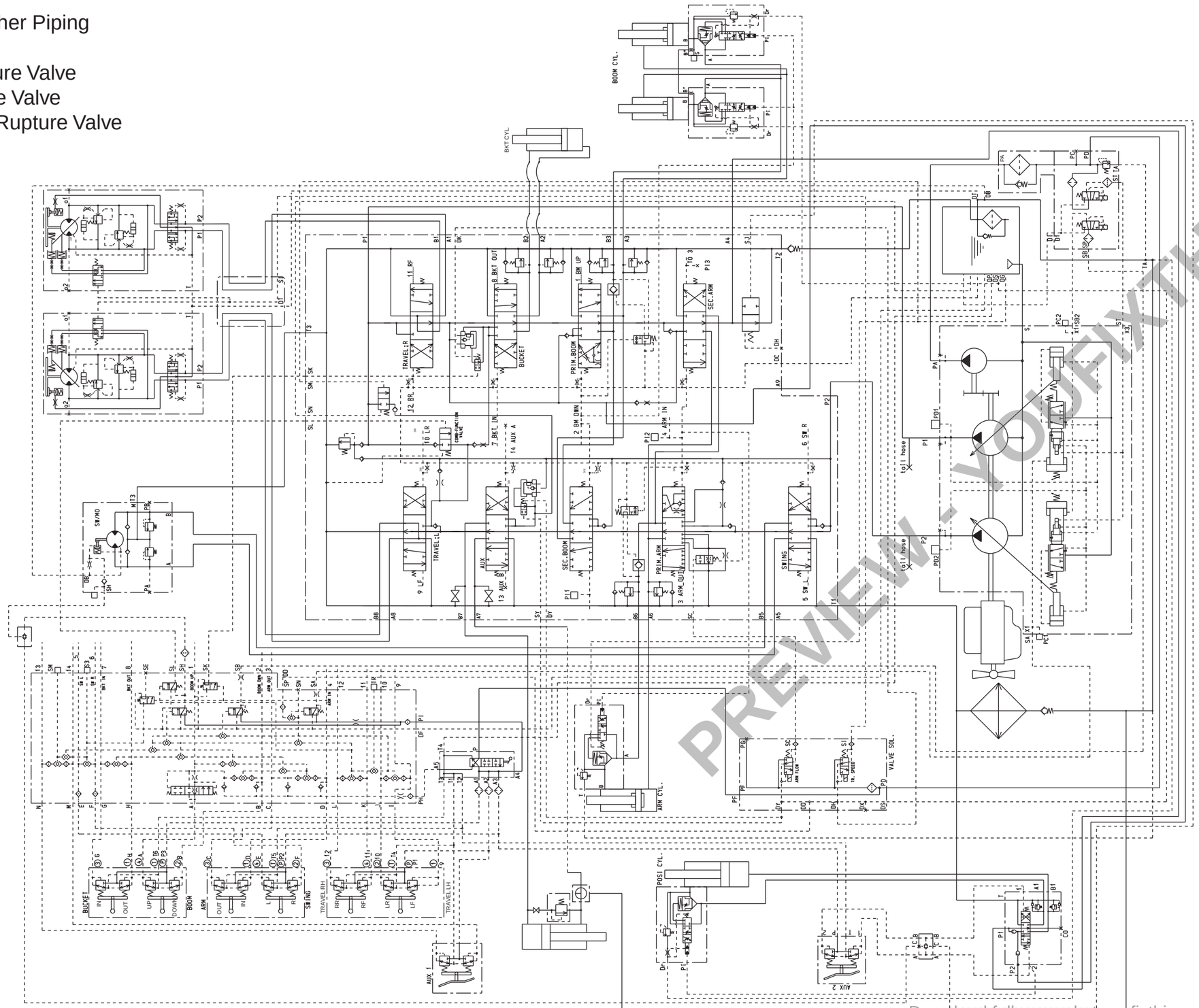
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ZAXIS160LC HYDRAULIC CIRCUIT DIAGRAM (EN)

NOTE: Refer to the PEFORMANCE STANDARD in the technicalmanual for the relief valve pressure setting value.

SPECIFICATIONS
·Breaker and Crusher Piping
·2-piece Boom
·Boom Hose Rupture Valve
·Arm Hose Rupture Valve
·Positioning Hose Rupture Valve



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Dr. EX FAULT CODE LIST

Fault Code	Trouble	Cause
01 02 03	Abnormal EEPROM Abnormal RAM Abnormal A/D Conversion	• Faulty MC
04	Abnormal Sensor Voltage	• Faulty MC • Faulty Harness • Faulty Sensor
06	Abnormal EC Sensor	• Faulty MC • Faulty Harness • Faulty EC Sensor
07	Abnormal Engine Control Dial Angle	• Faulty MC • Faulty Harness • Faulty Engine Control Dial
10 11	Abnormal Pump 1 Delivery Pressure Abnormal Pump 2 Delivery Pressure	• Faulty MC • Faulty Harness • Faulty Pump Delivery Pressure Sensor
12 13	Abnormal Pump1 Pump Control Pressure Abnormal Pump2 Pump Control Pressure	• Faulty MC • Faulty Harness • Faulty Pump Control Pressure Sensor
14 15 16 18	Abnormal Swing Pilot Pressure Abnormal Boom Raise Pilot Pressure Abnormal Arm Roll-In Pilot Pressure Abnormal Travel Pilot Pressure	• Faulty MC • Faulty Harness • Faulty Pilot Pressure Sensor
19	Abnormal Hydraulic Oil Temperature	• Faulty MC • Faulty Harness • Faulty Hydraulic Oil Temperature Sensor

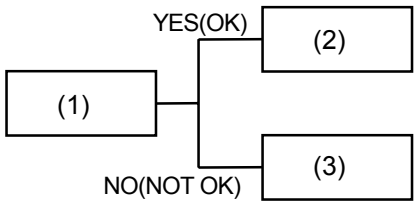
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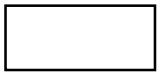
TROUBLESHOOTING B PROCEDURE

Apply troubleshooting B procedure when no fault code is displayed on the Dr. EX (or the built-in diagnosing system) although the machine's operation is abnormal.
On the front section pages of this group T5-4, are 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.

- How to Read the Troubleshoting Flow Charts



- After checking or measuring item (1), select either YES (OK) or NO (NOT OK) and proceed to item (2) or (3), as appropriate.


· Key switch: ON

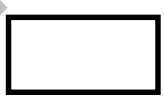
- Special instructions or reference item are indicated in the spaces under the box. Incorrect measuring or checking methods will render troubleshooting impossible, and may damage components as well.



- Explanation of how to use test harness kit required. Refer to "Electrical System Inspection" Group (Group 6) in this section.



- Use Dr. EX (or the built-in diagnosing system) function.



- Causes are stated in a thick-line box. Scanning through thick-line boxes, possible causes can be seen without going through the flow chart.

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VALVE CLEARANCE ADJUSTMENT

Summary:

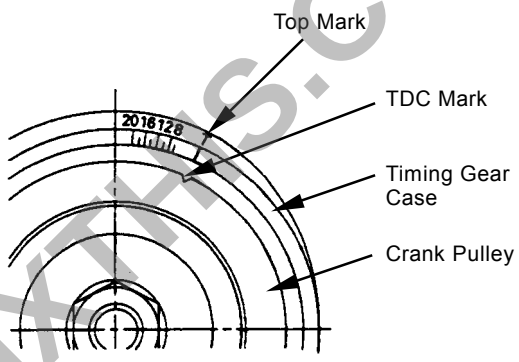
1. Perform the measurement when the engine is cold.
2. Before starting work, clean the head cover mounting area to avoid contamination in the engine.

Preparation:

1. Locate the top dead center (TDC) in the compression stroke.
   Align the TDC mark on the crank pulley with the pointer located on the timing gear case as illustrated. Piston No.1 (or piston No.6) is now positioned at the TDC in its compression stroke.

NOTE: When rotating the crank pulley, remove the fan guard. Then, rotate the fan while holding the fan belt. If it is difficult to rotate, remove all glow plugs to release the compression pressure.

2. Remove the head cover.
3. Move push rods for the intake and exhaust valves on the No.1 cylinder up and down by hand. If any clearances on the both ends of the push rods are found, piston No.1 is positioned at TDC in the compression stroke. (If the exhaust valve of cylinder No.1 is pushed down, piston No.4 is positioned at TDC in the compression stroke.
   Start measurement from the cylinder (No.1 or No.4) positioned at TDC in the compression stroke.



T157-05-02-002

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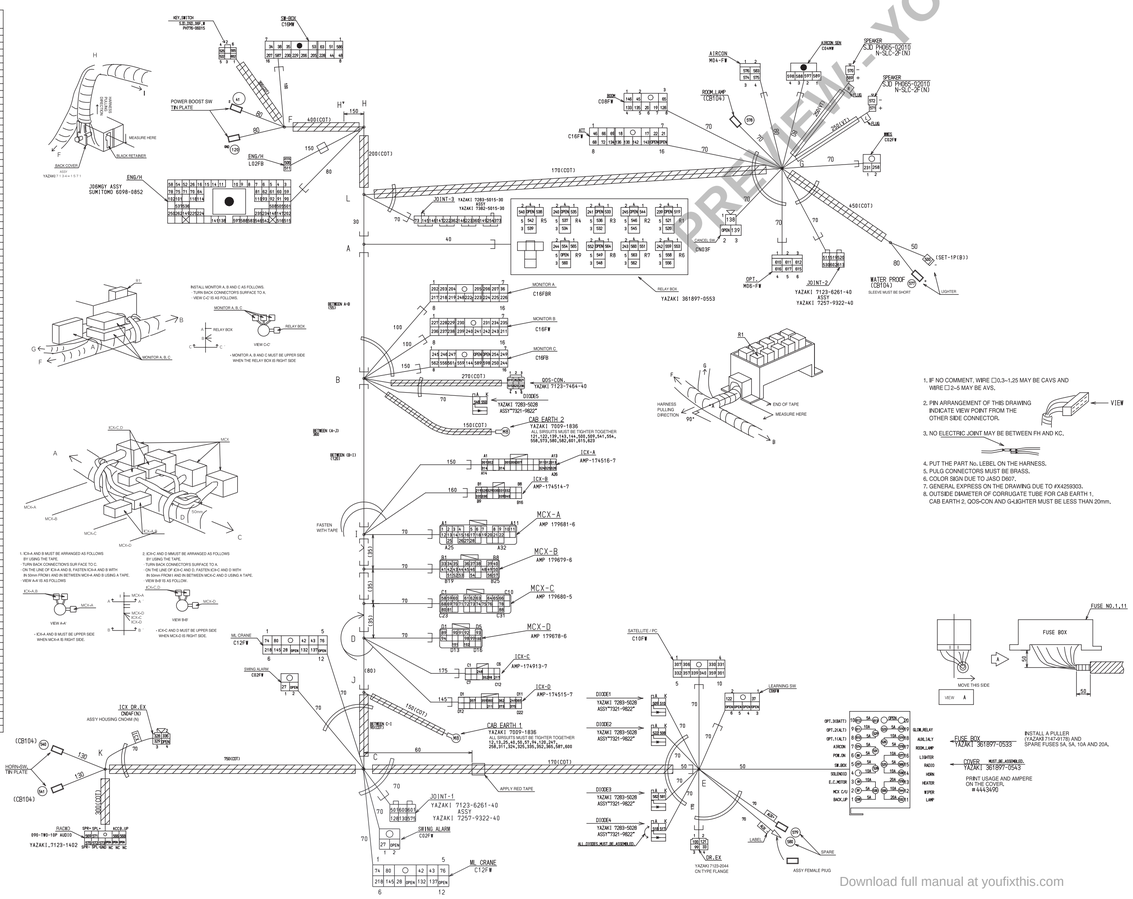
ZAXIS 160LC/180LC/180LCN CAB HARNESS

⚠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	COL.	CIRCUIT FROM	CIRCUIT TO	COMMENT
1	1.25	br-r	KC-101	FUSE-4	
2	1.25	br-r	KC-102	(1)	
3	0.5	r-B	KC-103	E/H	
4	0.5	L-Y	KC-104	E/H	
5	0.5	L-Y	KC-105	E/H	
6	0.5	L-G	KC-106	E/H	
7	0.5	Br-R	KC-107	E/H	
8	0.5	Y-B	KC-108	E/H	
9	0.5	L-Br	KC-109	E/H	
10	0.5	L-Y	KC-110	E/H	
11	0.5	L-g	KC-111	E/H	
12	1.25	R	KC-112	CAB EARTH 1	
13	1.25	R	KC-113	CAB EARTH 1	
14	0.5	L-gR	KC-114	E/H	
15	0.5	L-gB	KC-115	E/H	
16	0.5	L-gR	KC-116	E/H	
17	0.5	R-L	KC-117	ATT-5	
18	0.5	Y-L	KC-118	ATT-4	
19	0.5	G-Y	KC-119	SCH-7	
20	0.5	L-gY	KC-120	ATT-7	
21	0.5	Y-R	KC-121	ATT-6	
22	0.5	F	KC-122	ATT-8	
23					NO.USE
24					NO.USE
25	1.25	R	KC-125	CAB EARTH 1	
26	0.5	W	KC-126	E/H	
27	0.5	L	KC-127	SWING ALARM-1	
28	0.5	W	KC-128	ML-CRANE-6	
29					NO.USE
30					NO.USE
31					NO.USE
32					NO.USE
33	0.3	gr	KC-131	3P-E9-4	
34	0.5	B	KC-132	5P-E03 1	
35	0.3	gr	KC-133	5P-E03 5	
36	0.5	GL	KC-134	MONITOR-A1	
37	0.3	gB	KC-135	LEARNING SW-1	
38	0.5	GrL	KC-136	5P-E03 6	
39	0.5	B-Y	KC-137	FUSE-2	
40	0.85	B	KC-138	CAB EARTH 1	
41	0.5	W-L	KC-139	PDM_R_5B_5	AVS
42	0.3	GB	KC-140	ML-CRANE-3	
43	0.3	L	KC-141	ML-CRANE-4	
44	0.3	L	KC-142	5P-E03 3	
45	0.3	GY	KC-143	E03H-2	
46	0.5	L	KC-144	ATT-1	
47					NO.USE
48	0.3	G-G	KC-145	5P-E05 2	
49	0.5	B-Y	KC-146	CAB EARTH 1	
50	0.85	B	KC-147	CAB EARTH 1	
51	0.5	BL	KC-148	5P-E03 2	
52	0.85	B	KC-149	E/H	
53	0.5	BR	KC-150	5P-E03 4	
54	0.85	B	KC-151	E/H	
55	0.3	Lg	KC-152	E03H-3	
56	0.3	GR	KC-153	ATT-2	
57					NO.USE
58	0.3	GL	KC-157	ATT-9	
59	0.3	YL	KC-158	ATT-3	
60	0.3	YL	KC-159	E/H	
61	0.3	gB	KC-160	E/H	
62	0.3	BrL	KC-161	E/H	
63	0.5	B	KC-162	E/H	
64	0.3	BL	KC-163	ML-CRANE-2	
65	0.3	LY	KC-164	E/H	
66	0.3	BL	KC-165	ML-CRANE-5	
67	0.3	LY	KC-166	E/H	
68					NO.USE
69					NO.USE
70					NO.USE
71	0.3	gB	KC-174	E/H	
72	0.3	Br-L	KC-175	ATT-10	
73	0.5	B	KC-176	E03H-3	
74	0.3	BY	KC-177	ML-CRANE-1	
75	0.5	BB	KC-178	E/H	
76	0.3	GY	KC-179	ML-CRANE-6	
77					NO.USE
78	0.3	B	KC-201	E/H	
79					NO.USE
80	0.3	BL	KC-220	ML-CRANE-7	
81	0.3	LY	KC-221	E/H	
82					NO.USE
83					NO.USE
84					NO.USE
85					NO.USE
86					NO.USE
87					NO.USE
88	0.5	br-b	KC-231	FUSE-6	
89	1.25	br-r	KC-232	FUSE-3	
90	0.5	br-r	KC-233	E/H	
91	0.5	Gr	KC-234	E/H	
92	0.5	r	KC-235	E/H	
93	0.5	r	KC-236	E/H	
94	1.25	r	KC-237	CAB EARTH 1	
95					NO.USE
96					NO.USE
97					NO.USE
98	0.3	BL	KC-251	3P-E01	
99	0.3	GL	KC-301	3P-E01 3	
100	0.3	gL	KC-302	3P-E01	
101	0.5	B	KC-303	E/H	SWING_OP_SHIELD
102	0.5	B	KC-304	E/H	SWING_OP_SHIELD
103					NO.USE
110	0.85	gY	E/H	(12)	
111					NO.USE
112					NO.USE
113					NO.USE
114	0.85	gY	E/H	(13)	
115					NO.USE
116					NO.USE
117					NO.USE
118	0.3	gY	E/H	(14)	
					NO.USE

NO.	SIZE	COL.	CIRCUIT FROM	CIRCUIT TO	COMMENT
120	0.5	B	PDM_R_5B_GND	CAB EARTH 1	AVS
121	0.3	B	2P-E9-2	CAB EARTH 2	
122	0.3	B	LEARNING SW-2	CAB EARTH 2	
123					NO.USE
124					NO.USE
125					NO.USE
126					NO.USE
127					NO.USE
128	0.3	B	E03H-6	J03AT-1	
129					NO.USE
130	0.3	B	ATT-12	J03AT-1	
131					NO.USE
132	0.3	BG	ML-CRANE-12	(A2)	
133	0.3	BL	E03H-4	(A1)	
134	0.3	BL	ATT-13	(A1)	
135	0.3	BB	E03H-5	(B2)	
136	0.3	BG	ATT-11	(B2)	
137	0.3	BB	ML-CRANE-11	(B2)	
138	0.5	SB	CANCEL SW-1	E/H	
139	0.5	B	CANCEL SW-2	CAB EARTH 2	
140					NO.USE
141	0.5	BR	(BR)	E/H	
142	0.85	B	ATT-15	(GR)	
143	0.85	B	ATT-14	CAB EARTH 2	
144	0.5	B	MONITOR-C12	CAB EARTH 2	
145	0.3	B	ML-CRANE-7	J03AT-3	
146	0.5	B	E03H-1	J03AT-3	
147	0.5	BL	J03AT-3	E/H	
148	0.5	GL	J03AT-3	E/H	
149	0.5	BR	J03AT-3	E/H	
201					NO.USE
202	0.5	LT	MONITOR-A1	E/H	
203	0.3	BR	MONITOR-A2	(BR)	
204	0.3	BG	MONITOR-A3	(SB)	
205	0.3	T	MONITOR-A4	5P-E03 11	
206	0.3	Br	MONITOR-A5	5P-E03 12	
207	0.3	BR	MONITOR-A6	5P-E03 16	
208					
209					
210					NO.USE
211	0.5	LR	MONITOR-A10	2CH-D77	
212					NO.USE
213					
217	0.5	BL	MONITOR-A8	2CH-C12	
218	0.5	BR	MONITOR-A9	ML-CRANE-6	
219	0.5	B	MONITOR-A10	E03H-6	
220					NO.USE
221					
222	0.5	BL	MONITOR-A12	J03AT-3	
223	0.5	GL	MONITOR-A13	J03AT-3	
224	0.5	BG	MONITOR-A14	E/H	
225	0.5	GL	MONITOR-A15	E/H	
226	0.3	G-G	MONITOR-A16	(AB)	
227	0.3	L	MONITOR-B1	(AA)	
228	0.5	Lg	MONITOR-B2	5P-E05 10	
229	0.5	Gr	MONITOR-B3	5P-E05 13	
230	0.5	BR	MONITOR-B4	5P-E05 14	
231	0.5	P	MONITOR-B5	MIC1-1	
232					NO.USE
233					NO.USE
234	0.5	BG	MONITOR-B6	E/H	
235	0.5	BL	MONITOR-B7	E/H	
236	0.5	GL	MONITOR-B8	E03H-6	
237	0.5	YL	MONITOR-B9	FUSE-5	
238	0.5	GR	MONITOR-B10	FUSE-1	
239	0.5	BY	MONITOR-B11	RELAY 1-2	
240	0.5	BG	MONITOR-B12	RELAY 4-2	
241	0.5	BB	MONITOR-B13	RELAY 6-2	
242	0.5	LG	MONITOR-B14	RELAY 8-2	
243	0.5	B-R	MONITOR-B15	RELAY 9-2	
244	0.5	B-G	MONITOR-B16	RELAY 7-2	
245	0.5	BL	MONITOR-C1	RELAY 5-2	
246	0.5	R	MONITOR-C2	(BR)	
247	0.5	L	MONITOR-C3	CAB EARTH 1	
248	0.5	LY	MONITOR-B17	2CH-C5	
249	0.5	BR	MONITOR-C4	2CH-C6	
250	0.5	R	MONITOR-C5	E/H	
251					NO.USE
252					NO.USE
253					NO.USE
254	0.5	BR	MONITOR-C6	J03AT-3	
255					
256					
257					NO.USE
258	0.5	B	MIC-2	CAB EARTH 1	
259	0.5	L	E03H-2	E/H	
260					NO.USE
261	0.5	R	2CH-A1	SATELLITE-PC-10	
262	0.5	LY	2CH-A2	(BG)	
263	0.5	B-G	2CH-A3	(BG)	
264	0.5	BR	2CH-A6	SATELLITE-PC-2	
265	0.5	LR	2CH-A7	SATELLITE-PC-1	
266	0.5	B	2CH-A11	CAB EARTH 1	
267	0.5	GY	2CH-A12	(GB)	
268	0.5	B	2CH-A13	(GB)	
269	0.5	B	2CH-A14	2CH-A17	
270	0.5	B	2CH-A24	CAB EARTH 1	
271	0.5	B	2CH-A25	CAB EARTH 1	
272	0.5	GR	2CH-A26	(GB)	
273	0.5	L	2CH-B2	2CH 3B 23-1	
274	0.5	B	2CH-B3	2CH 3B 23-2	
275	0.5	YB	2CH-B4	SATELLITE-PC-3	
276	0.5	BY	2CH-B5	SATELLITE-PC-4	
277	0.5	BL	2CH-B6	SATELLITE-PC-5	
278	0.5	B	2CH-B7	SATELLITE-PC-6	
279	0.5	BR	2CH-B8	SATELLITE-PC-7	
280	0.5	B	2CH-B9	CAB EARTH 1	
281	0.5	BR	2CH-B10	2CH 3B 23-2	
282	0.5	B	2CH-C10	CAB EARTH 1	
283	0.5	LG	2CH-B13	SATELLITE-PC-7	
284	0.5	Gr	2CH-B14	SATELLITE-PC-6	
285					
286	0.5	B	2CH-C13	CAB EARTH 1	
287					
288					
289	0.5	Gr	2CH-C23	SATELLITE-PC-8	
290	0.5	BY	2CH-C25	SATELLITE-PC-9	
291	0.5	GL	2CH-C26	J03AT-3	
292	0.5	GL	2CH-C28	J03AT-3	
293					
294	0.5	B	2CH-D11	CAB EARTH 1	
295	0.5	BR	2CH-D12	J03AT-3	
296	0.5	B	2CH-D21	(GG)	
297					
298					
299					

NO.	SIZE	COL.	CIRCUIT FROM	CIRCUIT TO	COMMENT
501	1.25	R	LIGHTER-1-1	CAB EARTH 2	
502	1	B	E/H	J03AT-1	
503	1.25	BR	E/H	KEY-1B-6	
504	1	B	E/H	FUSE-11+	
508	2	BR	E/H	2D-6	AVS2
509	2	B	2D-4	CAB EARTH 2	AVS2
510	2	BR	2D-4	(GG)	AVS2
511	3	B	E/H	J03AT-2	
512	0.5	G	E05-4	E/H	
513	0.5	GY	E/H	2B-E8	
514	0.5	GY	2A-4	(SW)	
515	0.5	B	E/H	J03AT-2	
516	1.25	R	RELAY 7-1	J03AT-2	
517	2	R	RELAY 1-5	J03AT-2	
518	2	BR	RELAY 1-6	(GG)	
519	2	BR	2D-5	KEY-1B-5	AVS2
520	2	BG	(GG)	FUSE-17+	
524					NO.USE
525	3	BG	KEY_1B-4	FUSE-11+	
526	3	BR	(GG)	FUSE-17+	
527					NO.USE
528	5	R	(GR)	FUSE-4+	
529	5	R	(GR)	FUSE-6+	
530	3	R	J03AT-2	FUSE-1+	
531	3	BG	(GG)	FUSE-6+	
532	3	BG	RELAY 2-3	FUSE-11	
533	1.25	BG	RELAY 3-1	(GG)	
534	3	BG	RELAY 4-3	(GG)	
535	3	BG	RELAY 4-1	(GG)	
536	2	BL	RELAY 3-5	E/H	
537	2	B	RELAY 4-5	E/H	
538	0.5	BG	RELAY 5-1	FUSE14	
539	0.5	BR	RELAY 5-3	(GR)	
540	0.5	P	HORN_5B	RELAY 7-2	AVS
541	0.5	R	HORN_5B	CAB EARTH 2	AVS
542	0.5	BG	RELAY 5-5	E/H	
544	0.5	LY	RELAY 2-1	FUSE-12	
545	0.5	LY	RELAY 2-3	(GW)	
546	0.5	PK	E/H	RELAY 7-4	
548	0.5	LB	RELAY 8-3	2D-4	
549	0.5	B-R	RELAY 8-5	(GR)	
550	0.5	LB	2D-4	(GR)	
551	0.5	LY	RELAY 7-1	(GW)	
552	0.5	B-R	RELAY 8-2	(GR)	
553	0.5	LY	RELAY 8-1	(GW)	
554	0.5	B	RELAY 9-4	CAB EARTH 2	
555	0.5	LgR	RELAY 8-5	MONITOR-C14	
556	0.5	B	RELAY 6-5	CAB EARTH 2	
557	0.5	LB	RELAY 6-4	MONITOR-C11	
558	0.5	BR	RELAY 7-4	RELAY 5-3	
561	0.5	LY	MONITOR-C10	(GW)	
562	0.5	LR	RELAY 7-3	MONITOR-C9	
563	0.5	LY	RELAY 7-5	(GW)	
564	0.5	LY	RELAY 9-1	(GW)	
565	0.5	LY	RELAY 9-1	(GW)	
566	0.5	B-R	RADIO- ACC	FUSE-15	
567					NO.USE
568	0.5	GR	RADIO-3-LIP	(GB)	
569	0.5	LgR	RADIO- SPK+	SPK-	
570	0.5	LgR	RADIO- SPR-	SPR-	
571	0.5	LgR	RADIO- SPL+	SPL+	
572	0.5	LgR	RADIO- SPL-	SPL-	
573	0.5	B	RADIO- GND	CAB EARTH 2	
574	0.5	BY	A/HORN-3	FUSE-7	
575	2	B	A/HORN+	J03AT-1	
576	2	Br	FUSE-13	A/HORN-1	
577	1.25	Br	FUSE-16	LIGHTER-1H	
578	0.5	RB	FUSE-17	RCRN_6AF	AVS
579	0.85	R	FUSE-18	AUXL1A,1+	AVS
580	0.85	R	CAB EARTH 2	AUXL1A,1-	AVS
581	0.5	B	E/H	2D-6	
582	0.5	B	CAB EARTH 2	2D-4	
583	0.85	R	A/HORN-2	E/H	
585					
586	0.5	B	5P-E05 1	(GR)	
587	0.5	B	5P-E05 2	(GR)	
588	1.25	BR	5P-E05 3	CAB EARTH 1	
589	0.5	B	5P-E05 4	(GR)	
590	0.5	B	5P-E05 5	(GR)	
591	0.5	B	5P-E05 6	(GR)	
592	0.5	B	5P-E05 7	(GR)	
593	0.5	B	5P-E05 8	(GR)	
594	0.5	B	5P-E05 9	(GR)	
595	0.5	B	5P-E05 10	(GR)	
596	0.5	B	5P-E05 11	(GR)	
597	0.5	B	5P-E05 12	(GR)	
598	0.5	B	5P-E05 13	(GR)	
599	0.5	B	5P-E05 14	(GR)	
600	0.5	B	5P-E05 15	(GR)	
601	0.5	B	5P-E05 16	(GR)	
602	0.5	B	5P-E05 17	(GR)	
603	0.5	B	5P-E05 18	(GR)	
604	0.5	B	5P-E05 19	(GR)	
605	0.5	B	5P-E05 20	(GR)	
606	0.5	B	5P-E05 21	(GR)	
607	0.5	B	5P-E05 22	(GR)	
608	0.5	B	5P-E05 23	(GR)	
609	0.5	B	5P-E05 24	(GR)	
610	0.5	B	5P-E05 25	(GR)	
611	0.5	B	5P-E05 26	(GR)	
612	1.25	B	5P-E05 27	(GR)	
613	0.5	B	5P-E05 28	(GR)	
614					NO.USE
615	0.5	B	5P-E05 29	(GR)	
616	0.5	B	5P-E05 30	(GR)	
617	0.5	BL	5P-E05 31	(GR)	
618	0.5	BY	5P-E05 32	(GR)	
619	0.5	GY	5P-E05 33	(GR)	
620	0.5	B	5P-E05 34	(GR)	
621	1.25	BR	5P-E05 35	(GR)	
622	0.5	B	5P-E05 36	(GR)	
623	0.5	B	5P-E05 37	(GR)	



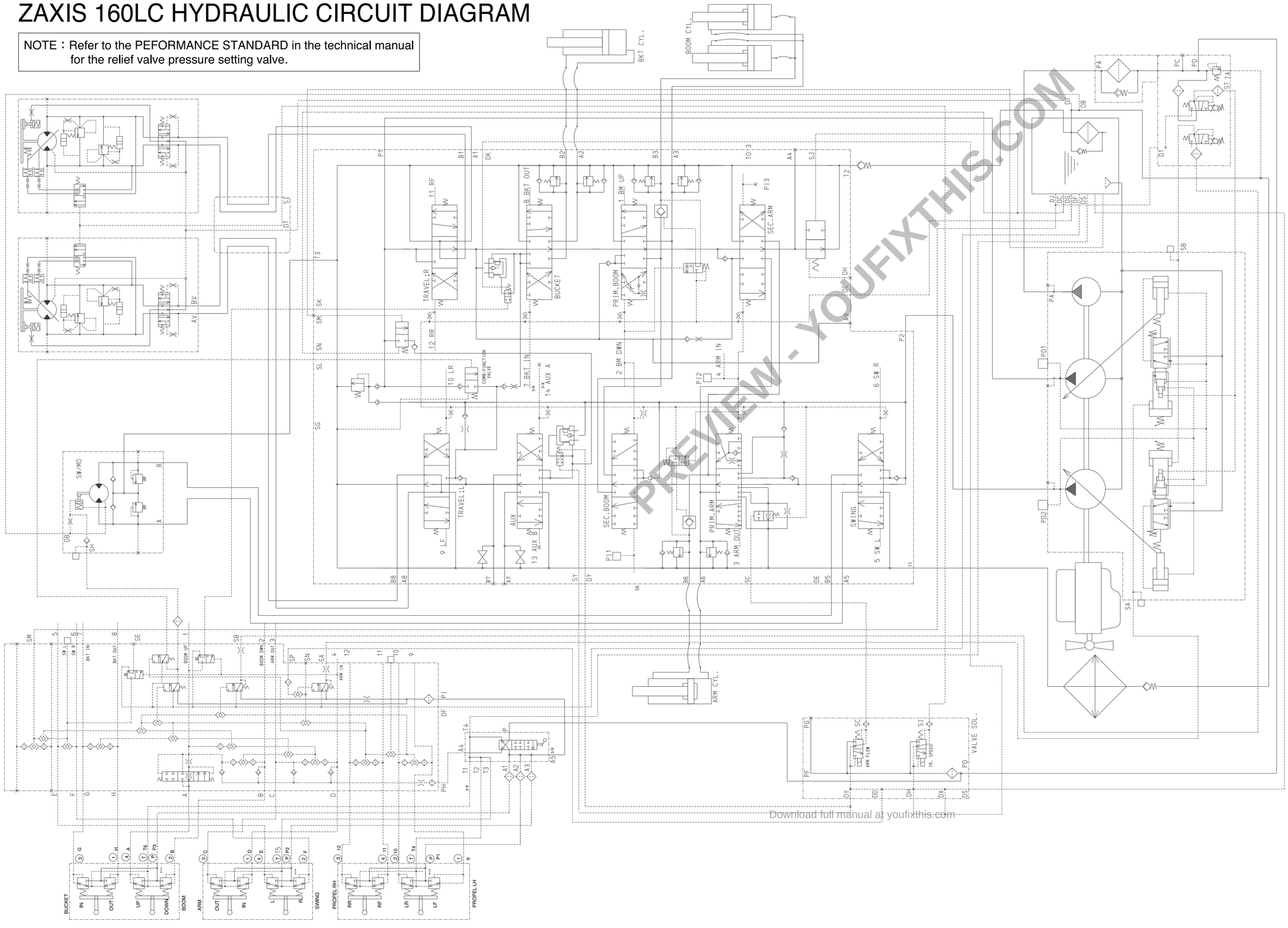
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Attach to Vol. No. :TT1F1E-02

ZAXIS 160LC HYDRAULIC CIRCUIT DIAGRAM

NOTE : Refer to the PEFORMANCE STANDARD in the technical manual for the relief valve pressure setting valve.



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FAULT CODE LIST

Fault code	Problem	Cause
01 02 03	Abnormal EEPROM Abnormal RAM Abnormal A/D Conversion	• Faulty MC
04	Abnormal Sensor Voltage	• Faulty MC • Faulty Harness • Faulty Sensor
06	Abnormal EC Sensor	• Faulty MC • Faulty Harness • Faulty EC Sensor
07	Abnormal Engine Control Dial Angle	• Faulty MC • Faulty Harness • Faulty Engine Control Dial
10 11	Abnormal Pump 1 Delivery Pressure Abnormal Pump 2 Delivery Pressure	• Faulty MC • Faulty Harness • Faulty Pump Delivery Pressure Sensor
12 13	Abnormal Pump1 Pump Control Pressure Abnormal Pump2 Pump Control Pressure	• Faulty MC • Faulty Harness • Faulty Pump Control Pressure Sensor
14 15 16 18	Abnormal Swing Lever Stroke Abnormal Boom Raise Lever Stroke Abnormal Arm Roll-In Lever Stroke Abnormal Travel Lever Stroke	• Faulty MC • Faulty Harness • Faulty Pilot Pressure Sensor
19	Abnormal Oil Temperature	• Faulty MC • Faulty Harness • Faulty Oil Temperature Sensor

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RELATIONSHIP BETWEEN MACHINE TROUBLE SYMPTOMS AND RELATED PARTS

This table indicates the relationship between machine trouble symptoms and the potential problem parts, which may cause trouble if failed, and the evaluation methods of these components.

Parts		EC Motor	EC Sensor
Function		• Moves governor.	• Detects minimum governor speed position (2.5 V) only when key switch is turned ON. • Detects minimum and maximum speed position when engine learning is conducted.
Symptoms in control system when trouble occurs.		• Governor lever doesn't move.	• Engine speed is controlled based on idle position set when key switch is turned ON. Therefore, engine speed is always controlled with error in idle position setting if set incorrectly.
Symptoms in machine operation when trouble occurs.		• Even if engine control dial is turned, engine speed doesn't increase from slow idle speed. • Engine start may be difficult though starter rotates. • Engine will stall if discontinuity occurs in EC motor while engine is running at more than a specified speed. • Engine will become uncontrollable if discontinuity occurs in EC motor while engine is running at lower than a specified speed. Engine cannot be stopped with key switch.	• Error in setting will seldom occur so that change in machine operation will not be noticed. • In case error is set on lower side, engine speed changes but runs slower than normal through the full range when engine control dial is turned. (Note: In case error is set on upper side, EC motor is driven so that it runs faster than the control range. However, motor, a worm gear type, holds governor lever at maximum constant position, preventing engine stall. When engine control dial is turned to minimum speed position, governor lever is returned to idle position.) • When starting engine, engine speed fluctuates. • Starting engine is occasionally difficult.
Evaluation	By Fault Code	—	Fault code 06 is displayed.
	By Monitor Function	—	Monitor Item: EC Angle (Displayed by built-in diagnosing system)
	Using Test Harness	• Install lamp harness (ST 7125) to check EC output signal and harness for any abnormality.	—
	Others	—	—
NOTE		• Engine is stopped by EC motor. (Engine stop motor is not provided.) Fuel cut-off cable is provided.	• If EC sensor is faulty, engine learning is not performed.
Descriptions of Control (Operational Principle Section in T/M)		T2-1	T2-1

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NOZZLE CHECK

Summary:

1. Check the injection pressure and the spray pattern with a nozzle tester.
2. Before starting work, clean the nozzle holder mounting area to avoid contamination in the engine.

Preparation:

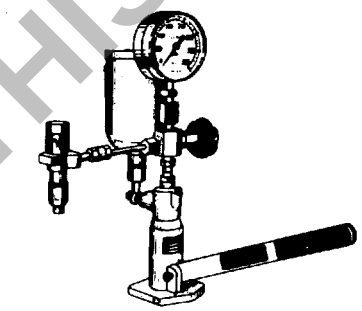
1. Remove the nozzle holders.
   Remove all nozzle holders and fuel injection pipings from the engine.
2. Attach a nozzle holder to the nozzle tester.

Measurement:

CAUTION: Never touch spray directly. The fuel spray from the nozzle may penetrate the skin, resulting in serious injury. If fuel penetrates into the blood stream, it may cause blood toxication.

1. Injection pressure
   After attaching the nozzle holder to the nozzle tester, strongly make several strokes of the tester to inject fuel. Then, while operating the tester at approx. 60 time strokes a minute, measure the fuel injection pressure.
   If adjustment is required, loosen the lock nuts and adjust the adjusting screws. Turn clockwise to increase the pressure, and counterclockwise to decrease the pressure.
2. Spray pattern
   For this test, turn the pressure tester knob to bypass the pressure gauge. Attach the nozzle holder to the nozzle tester. Strongly make several strokes of the tester and check the fuel spray pattern.
3. Oil tight condition
   Keep the pressure slightly below the injection pressure. Check for fuel leak from around the nozzle tip.

NOTE: Use clean diesel oil.



T107-06-02-006

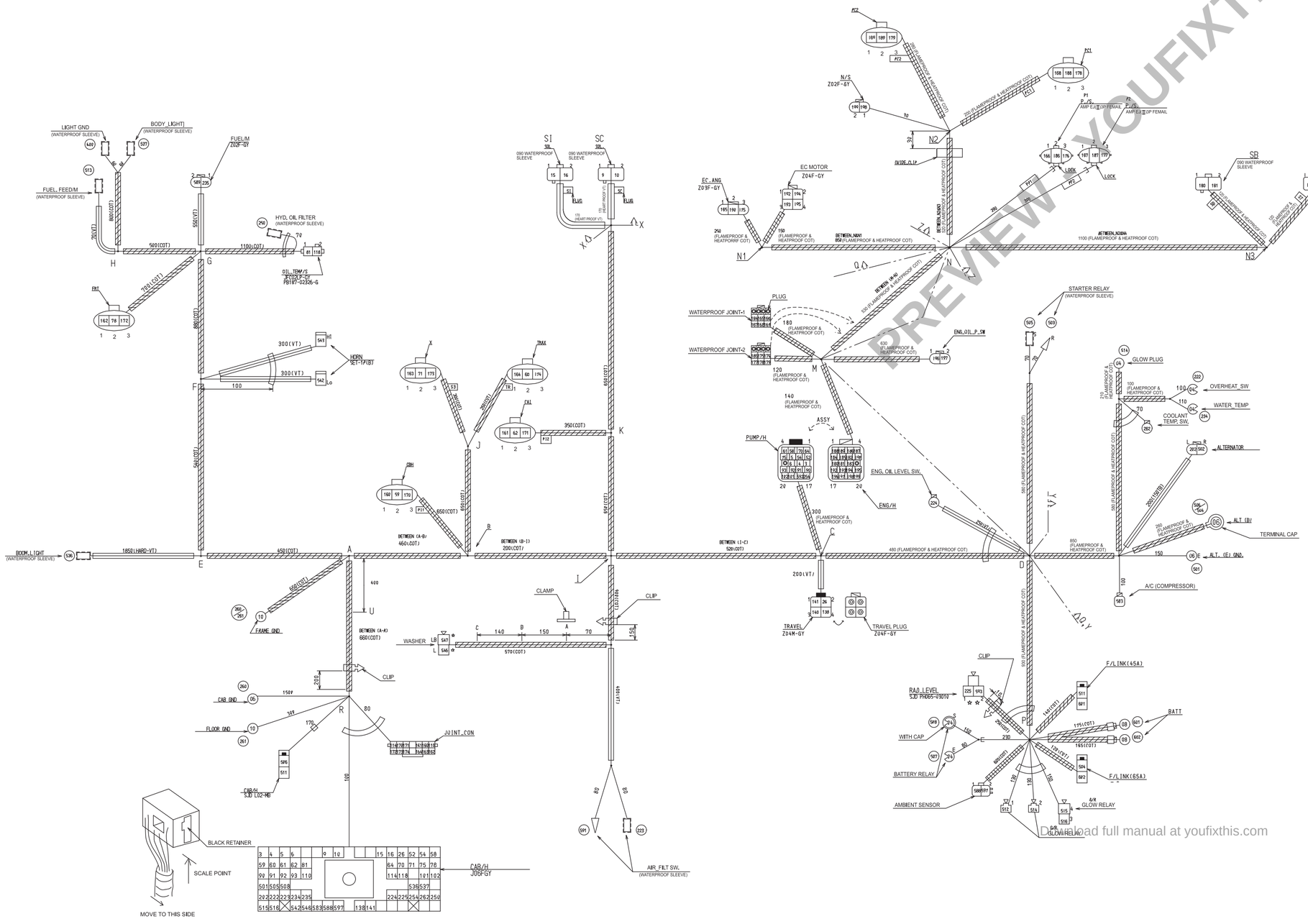
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ZAXIS 160LC/180LC/180LCN ENGINE HARNESS

NO	SIZE	COLOR	CIRCUIT FROM	CIRCUIT TO	COMMENT
3	0.5	LB	CAB/H	PUMP/H-9	
4	0.5	LR	CAB/H	PUMP/H-10	
5	0.5	W-R	CAB/H	PUMP/H-7	
6	0.5	GR	CAB/H	PUMP/H-11	
7					NO_USE
8					NO_USE
9	0.5	W	CAB/H	SC-1	AVX
10	0.5	G	CAB/H	SC-2	AVX
11					NO_USE
14					NO_USE
15	0.5	L	CAB/H	S1-1	AVX
16	0.5	Lg	CAB/H	S1-2	AVX
26	0.5	R	CAB/H	TRAVEL ALARM-2	
52	0.85	RY	CAB/H	PUMP/H-5	
54	0.85	BY	CAB/H	PUMP/H-6	
58	0.5	RG	CAB/H	PUMP/H-3	
59	0.5	BL	CAB/H	CBH-2	CAVS
60	0.5	YR	CAB/H	TRAV-2	CAVS
61	0.5	GY	CAB/H	PUMP/H-4	
62	0.5	RB	CAB/H	CA1-2	CAVS
64	0.5	WG	CAB/H	PUMP/H-1	
70	0.5	YB	CAB/H	PUMP/H-2	
71	0.5	BR	CAB/H	X-2	CAVS
75	0.5	RW	CAB/H	PUMP/H-8	
78	0.5	R	CAB/H	FAT-2	CAVS
81	0 5	LY	CAB/H	OIL_TEMP/S-1	
90	0.5	B-	CAB/H	PUMP/H-13	
91	0.5	Or	CAB/H	PUMP/H-14	
92	0.5	R	CAB/H	PUMP/H-15	
93	0.5	Y	CAB/H	PUMP/H-16	
101	0.5	W	CAB/H	PUMP/H-19	INNER_IF_SHIELD
102	0.5	B	CAB/H	PUMP/H-20	OUTER_IF_SHIELD
110	0.85	RY	CAB/H	JOINT_CON	
114	0.85	BY	CAB/H	JOINT_CON	
118	0.5	BY	CAB/H	OIL_TEMP/S-2	
130	0.5	GR	CAB/H	TRAVEL ALARM-4	
140	0.5	B	TRAVEL ALARM-3	(GY)	
141	0.5	WY	CAB/H	TRAVEL ALARM-1	
160	0.5	RY	JOINT_CON	CBH-1	CAVS
161	0.5	RY	JOINT_CON	CA1-1	CAVS
162	0.5	RY	JOINT_CON	FRT-1	CAVS
163	0.5	RY	JOINT_CON	X-1	CAVS
164	0.5	RY	JOINT_CON	TRAV-1	CAVS
165	0.5	RY	WATERPROOF-1	EC ANG-1	
166	0.5	R	WATERPROOF-1	P/S_P1-1	OR-1
167	0.5	R	WATERPROOF-1	P/S_P2-1	OR-1
168	0.5	R	WATERPROOF-1	PT1-1	OR-1
169	0.5	R	WATERPROOF-1	PC2-1	OR-1
170	0.5	BY	JOINT_CON	CBH-3	CAVS
171	0.5	BY	JOINT_CON	CA1-3	CAVS
172	0.5	BY	JOINT_CON	FRT-3	CAVS
173	0.5	BY	JOINT_CON	X-3	CAVS
174	0.5	BY	JOINT_CON	TRAV-3	CAVS
175	0.5	RY	WATERPROOF-2	EC ANG-3	
176	0.5	R	WATERPROOF-2	P/S_P1-3	OR-1
177	0.5	R	WATERPROOF-2	P/S_P2-3	OR-1
178	0.5	R	WATERPROOF-2	PT1-3	OR-1
179	0.5	R	WATERPROOF-2	PC2-3	OR-1
180	0.5	W	ENG/H-9	SB-1	OR-1
181	0.5	R	ENG/H-10	SB-2	OR-1
182	0.5	BR	ENG/H-7	ST-1	OR-1
183	0.5	B	ENG/H-11	ST-2	OR-1
184	0.85	RY	ENG/H-5	WATERPROOF-1	
185	0.85	RY	ENG/H-6	WATERPROOF-2	
186	0.5	Gr	ENG/H-3	P/S_P1-2	OR-1
187	0.5	L	ENG/H-4	P/S_P2-2	OR-1
188	0.5	O	ENG/H-1	PC1-2	OR-1
189	0.5	WL	ENG/H-2	PC2-2	OR-1
190	0.5	RW	ENG/H-8	EC ANG-2	
191					NO_USE
192	0.5	Br	ENG/H-13	EC MOTOR 1	
193	0.5	Gr	ENG/H-14	EC MOTOR 3	
194	0.5	R	ENG/H-15	EC MOTOR 2	
195	0.5	Y	ENG/H-16	EC MOTOR 4	
196	0.5	WR	ENG/H-17	ENG OIL P SW-1	
197	0.5	B	ENG/H-18	ENG OIL P SW-2	
198	0.5	W	ENG/H-19	NC-1	ENGA_IF_SHIELD
199	0.5	B	ENG/H-20	NC-2	ALTER_IF_SHIELD
202	0.5	LY	CAB/H	ALT-L	AEX
222	0.5	RL	CAB/H	OVERHEAT	AEX
223	0.5	GL	CAB/H	AIR_FILT-F	
224	0.5	WR	CAB/H	ENG_OIL_LEV	
225	0.5	Gr	CAB/H	RAD_LEV-1	
234	0.5	WR	CAB/H	WATER_TEMP	AEX
235	0.5	Br	CAB/H	FUEL_M-1	
250	0.5	WL	CAB/H	HYD. OIL FILTER	
252					NO_USE
253					NO_USE
254	0.5	WR	CAB/H	PUMP/H-17	
259					NO_USE
260	5	B	FRAME_GND	CAB_GND	
261	5	B	FRAME_GND	FLOOR_GND	
262	0 5	L	CAB/H	COOLANT TEMP. SW.	AEX
501	3	B	CAB/H	ALT-E	
502	0 85	W	ALT-R	(GN) (⊕)	AEX
503	0 85	WG	(GY) (⊕)	SAFE/R-R	
504	8Y	W	65A_F/L	ALT-B	AEX
505	1.25	BW	CAB/H	SAFE/R-S	
506	5	W	ALT-B	CAB/H	
507	2	B	(GY)	BATT/R-E	
508	2	RB	CAB/H	BATT/R-S	
511	3	R	45A_F/L	CAB/H	
512	3	R	(GY) (⊕)	G/R-1	
513	2	R	(GY) (⊕)	FUEL_FEED/M	
514	3	BY	G/R-2	GLOW	
515	0 5	GR	CAB/H	G/R-4	
516	0 5	GY	CAB/H	G/R-3	
536	2	RL	CAB/H	BOOM_LIGHT	
537	2	R	CAB/H	BODY_LIGHT	
542	0 5	RG	CAB/H	HORN-LO	
543	0 5	RG	(GR) (⊕)	HORN-HI	
546	0 5	Pu	CAB/H	WASHER-L	
547	0 5	B	(GY)	WASHER-LB	
583	0.85	W	CAB/H	A/C (COMPRESSOR)	
588	0 5	RB	CAB/H	AMBIENT SENSOR-1	
589	0 5	B	(GY)	FUEL_M-2	
591	0.5	B	(GY)	AIR_FILT-H	
592	0 5	B	(GY)	PUMP/H-18	
593	0 5	B	(GY)	RAD_LEVEL-2	
597	0 5	BR	CAB/H	AMBIENT SENSOR-2	
600	2	B	LIGHT GND.	(GY)	
601	5	R	45A_F/L	BATT	
602	8Y	W	65A_F/L	BATT	AEX



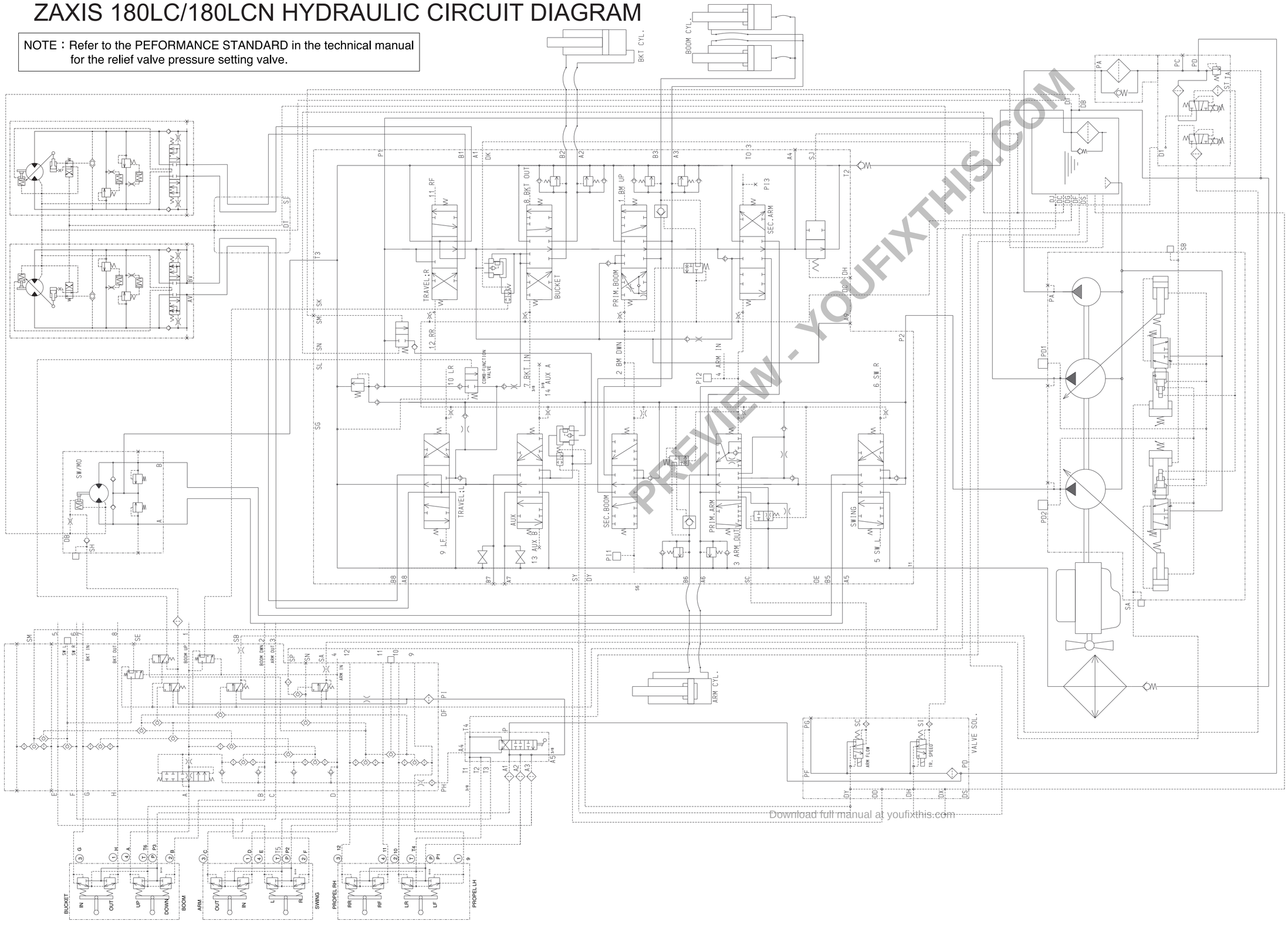
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ZAXIS 180LC/180LCN HYDRAULIC CIRCUIT DIAGRAM

NOTE：Refer to the PEFORMANCE STANDARD in the technical manual for the relief valve pressure setting valve.



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ICX FAULT CODE LIST

Fault Code	Trouble	Remarks
1	Abnormal Internal RAM	In case of SAM error
2	Abnormal Flush Memory	In case of SAM error
3	Abnormal Exterior	In case of SAM error or read-write error
4	Abnormal EEPROM	In case of SAM error
5	Overwritten Data Save Area	In case data save area was overwritten.
6	Abnormal Time	In case RTC data was other than figures.
7	MC Communication Timeout (For ZAXIS)	In case MC communication didn't last for more than 7 seconds.
8	Monitor Communication Timeout	In case monitor communication didn't last for more than 24 seconds.
9*	MC Communication Timeout (For EX5)	In case MC communication didn't last for more than 20 seconds.
10	Satellite Terminal Communication Timeout	In case satellite communication didn't last for more than 1 minute.

*NOTE * Fault code 9 may be displayed on only the machine (Type: EX5 with minor change), to which the ICX is installed later.*

SATELLITE TERMINAL FAULT CODE LIST

Fault Code	Trouble	Remarks
101	Satellite Terminal: Internal Error	Abnormal EEPROM
102	Satellite Terminal: Internal Error	Abnormal sent data
103	Satellite Terminal: Internal Error	In case reception is difficult.
104	Satellite Terminal: Communication Error	In case satellite communication cannot be accomplished.
105	Satellite Terminal: Internal Error	In case sending retry over occurred or local loop back test failed with power ON.
106	Satellite Terminal: Communication Error	In case sending retry over occurred.
107	Satellite Terminal: Abnormal Harness	In case reception data doesn't match sending data.

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Engine Control Dial	Pump Control Pressure Sensor	Pump 1 Delivery Pressure Sensor
• Indicates governor lever position (engine target speed).	• Monitors pump control pressure to control auto-acceleration system and travel motor swash angle controls.	• Monitors pump delivery pressure to control HP mode, auto-acceleration, and travel motor swash angle controls.
• Engine speed doesn't change even if engine control dial is turned. • If discontinuity or short circuit occurs in engine control dial, target speed of 1400 min^{-1} is used as back-up value.	• No signals arrive to MC	• If pump delivery pressure sensor output is 0 or 5 V, following symptoms will be presented by back-up mode function.
• Engine speed is kept unchanged from 1400 min^{-1}. (Auto-idle system functions. Engine can be stopped by key switch.)	• Auto-acceleration control is inoperable (but not noticeable). • Travel speed is kept in slow mode, not allowing to automatically change to fast mode.	• HP mode is inoperable. • Auto-acceleration control is inoperable. • Travel speed is kept in slow mode, not allowing to automatically change to fast mode.
Fault code 07 is displayed.	Fault code 12 and 13 are displayed.	Fault code 10 is displayed.
Monitor Item: Engine Target Speed, Dial Angle (Displayed by built-in diagnosing system)	Monitor Item: Pump 1 and 2 pump control pressure (Displayed by built-in diagnosing system)	Monitor Item: Pump 1 delivery pressure (Displayed by built-in diagnosing system)
—	—	—
—	—	—
—	• Evaluation by Dr. EX Broken Circuit: 0.25 V or less Short Circuit: 4.75 V or more	—
T2-1	T2-1	T2-1

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INJECTION TIMING

Inspection:

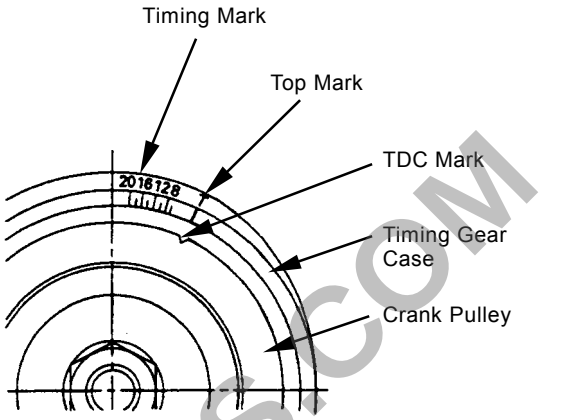
1. Position No.1 piston to the top dead center. Turn the crank pulley in the direction of rotation (clockwise as seen from the front of the engine) to set a "TDC" mark on the crank pulley under the "Top mark", located on the timing gear case.

NOTE: When rotating the crank pulley, remove the fan guard. Then, rotate the fan while holding the fan belt. If it is difficult to rotate, remove all glow plugs to release the compression pressure.

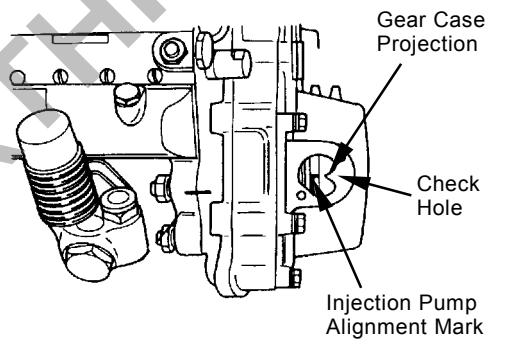
2. Remove the timing check hole cover on the front section of the fuel injection pump.
   When the mark on the injection pump is set under the projection of the gear case, No.1 piston is positioned at the top dead center. If the mark is not set under the projection, keep turning to adjust.

NOTE: The alignment mark on the injection pump cannot be directly seen through the check hole. Use a mirror for checking.

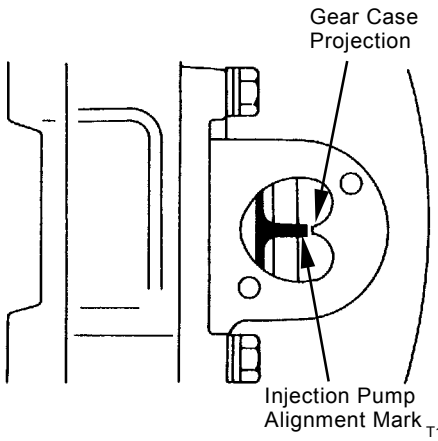
3. Remove the injection piping from No.1 cylinder.
4. Remove the delivery valve holder for No.1 cylinder from the injection pump to pull the delivery valve and the spring out. Reinstall the delivery valve holder.
   : 39 to 44 N·m
   (4 to 4.5 kgf·m, 28.9 to 32.6 lbf·ft)



T157-05-02-002



T107-02-12-007

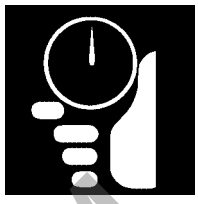


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SECTION 4
OPERATIONAL PERFORMANCE TEST



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RECOGNIZE SAFETY INFORMATION

- This is the **SAFETY ALERT SYMBOL**.
  - When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.
  - Follow recommended precautions and safe operating practices.



001-E01A-0688

SA-688

UNDERSTAND SIGNAL WORDS

- On machine safety signs, signal words designating the degree or level of hazard - DANGER, WARNING, or CAUTION - are used with the safety alert symbol.
  - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
  - **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
  - **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
    DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on **CAUTION safety signs**.
  - Some safety signs don't use any of the designated signal words above after the safety alert symbol are occasionally used on this machine.
- **CAUTION** also calls attention to safety messages in this manual.
- To avoid confusing machine protection with personal safety messages, a signal word **IMPORTANT** indicates a situation which, if not avoided, could result in damage to the machine.
- ***NOTE*** indicates an additional explanation for an element of information.

002-E01C-1223



SA-1223

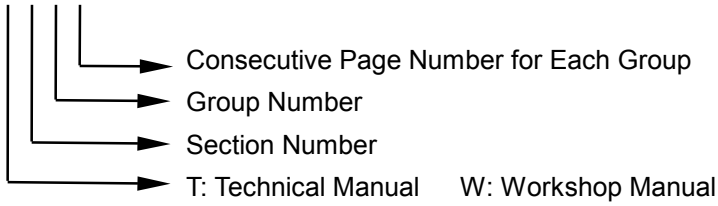
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PAGE NUMBER

- Each page has a number, located on the center lower part of the page, and each number contains the following information:

Example : T 1-3-5



SAFETY ALERT SYMBOL AND HEADLINE NOTATIONS

In this manual, the following safety alert symbol and signal words are used to alert the reader to the potential for personal injury of machine damage.

⚠ This is the safety alert symbol. When you see this symbol, be alert to the potential for personal injury.
Never fail to follow the safety instructions prescribed along with the safety alert symbol.
The safety alert symbol is also used to draw attention to component/part weights.
To avoid injury and damage, be sure to use appropriate lifting techniques and equipment when lifting heavy parts.

- ⚠ **CAUTION:**
  Indicated potentially hazardous situation which could, if not avoided, result in personal injury or death.

- **IMPORTANT:**
  Indicates a situation which, if not conformed to the instructions, could result in damage to the machine.

- *NOTE:*
  Indicates supplementary technical information or know-how.

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