PART NO.

HITACHI

Technical Manual

EX

EX400-5
EX400LC-5
EX450LC-5
Hydraulic Excavator

Service Manual consists of the following separate Part No.
Technical Manual
Workshop Manual

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FAULT CODES 09, 10 (EC Sensor Failure)

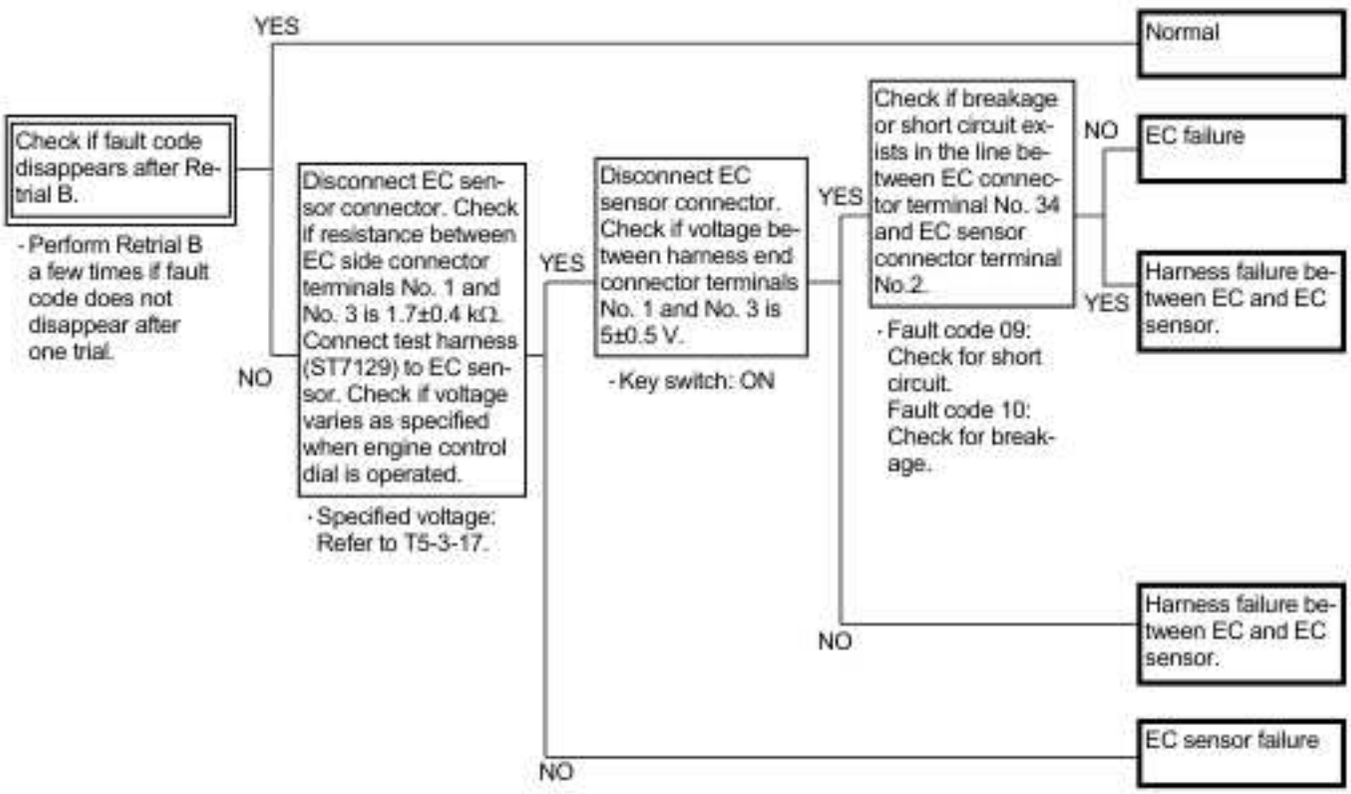
Precondition:

- Be sure inspect wiring connections prior to troubleshooting.

Checking Instruction:

- Fault code 09 indicates the input voltage from the EC sensor is 4.75 V or more.

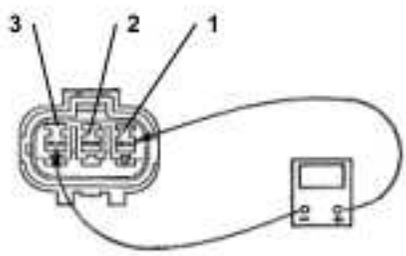
Fault code 10 indicates the input voltage from the EC sensor is 0.25 V or less.



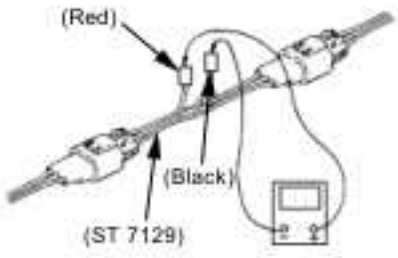
EC Harness End Connector (Open End Side)



EC Sensor Side Connector (Open End Side)

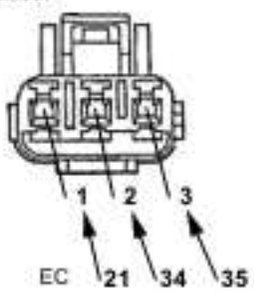


T107-07-03-008



T107-07-03-009

Harness End Connector (Open End Side) EC Sensor



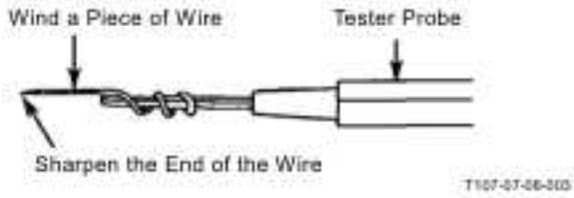
T102-05-03-005

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4. Precaution for using a circuit tester.

1) Before using a circuit tester, refer to the instructions in the circuit tester manual.
Then, set the circuit tester to meet the object to be measured, voltage range and current polarity.

2) Before starting the connector test, always check the connector terminal numbers, referring to the circuit diagram.
When the connector size is very small, and the standard probe size is too large to be used for testing, wind a fine piece of sharpened wire or a pin around the probe to make the test easier.

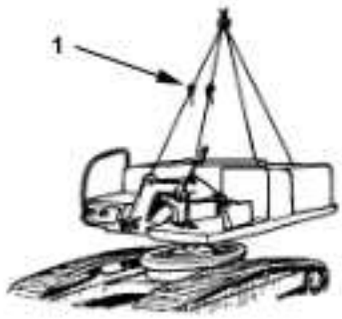


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Installation

CAUTION: Approximate weight of main frame: 9380 kg (20700 lb) (EX400-5) 9500 kg (21000 lb) (EX450H-5)

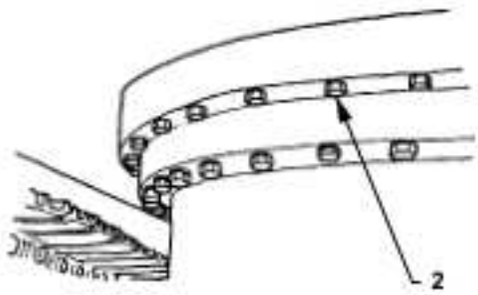
1. Fasten hoist to front and shackle of main frame.
   Level main frame by adjusting chain blocks (1) and lower main frame onto undercarriage.
   Align the matching mark on the swing bearing with that on the main frame.



W157-02-03-002

2. Install bolts (2) and the knock pins on the swing bearing and tighten temporary.
   Remove wire ropes and the special tool (ST 0915).
   Install main frame and tighten bolts to specification.

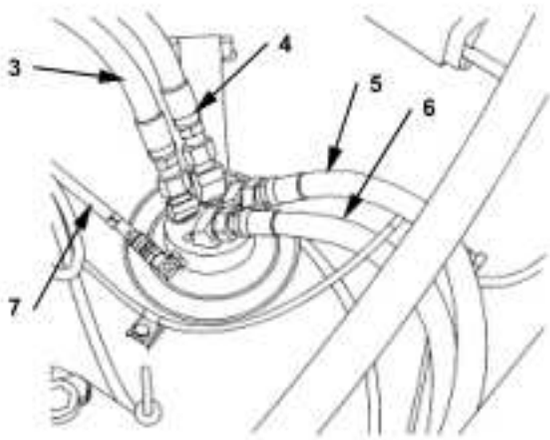
   : 41 mm
   Upperstructure side
   : 1370 N·m (140 kgf·m, 1010 lbf·ft)



W165-02-03-007

3. Connect drain hose (7) to the center joint.

   Connect lines (3 to 6).
   : 22 mm
   : 39 N·m (4 kgf·m, 29 lbf·ft)
   : 27 mm
   : 93 N·m (9.5 kgf·m, 69 lbf·ft)
   : 41 mm
   : 205 N·m (21 kgf·m, 152 lbf·ft)



M162-07-071

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EX400-5, EX400LC-5, EX450LC-5
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EX400-5 EX400LC-5 EX450LC-5 CAB HARNESS (STD) 2

NO.	SIZE	COLOR	CIRCUIT FROM	CIRCUIT TO	COMENT
1	0.5	LOr	E c/u 1	RELAY/H 3	CAVS
2	0.5	BW	E c/u 2	V c/u 11	CAVS
3	0.5	BY	E c/u 3	V c/u 5	CAVS
4	0.5	W	E c/u 4	ENG/H	AV Seald
8	0.5	YR	E c/u 8	ENG/H	CAVS
9	0.5	BR	E c/u 9	V c/u 4	CAVS
10	0.5	BL	E c/u 10	V c/u 12	CAVS
11	0.5	B	E c/u 11	ENG/H	AV Seald
17	0.5	OrL	E c/u 17	RELAY/H 1	CAVS
18	0.5	OrB	E c/u 18	RELAY/H 1	CAVS
19	0.5	BG	E c/u 19	ENG/H	CAVS
20	0.5	RG	E c/u 20	EX2-1 2	CAVS
21	0.5	WG	E c/u 21	ENG/H	CAVS
22	0.5	WG	E c/u 22	(21)	CAVS
23	0.5	WR	E c/u 23	Eng.Control Dial 9	CAVS
24	0.5	BrY	E c/u 24	FUSE 2	CAVS
25	0.5	B	E c/u 25	Floor GND	CAVS
26	0.5	RB	E c/u 26	(39)	CAVS
30	0.5	W	E c/u 30	RELAY/H 1	CAVS
33	0.5	LY	E c/u 33	ENG/H	CAVS
34	0.5	GB	E c/u 34	ENG/H	CAVS
35	0.5	WB	E c/u 35	ENG/H	CAVS
36	0.5	WB	E c/u 36	(35)	CAVS
37	0.5	BrY	E c/u 37	(24)	CAVS
38	0.5	B	E c/u 38	(25)	CAVS
39	0.5	RB	E c/u 39	FUSE 6	CAVS
40	0.5	B	(101)	Pow.Boost SW	CAVS
42	0.5	W	(233)	ENG/H	CAVS
45	0.5	RY	(240)	ENG/H	CAVS
101	1.25	B	E c/u 101	Floor GND	CAVS
102	0.5	BrW	E c/u 102	RELAY/H 3	CAVS
103	0.5	Br	E c/u 103	ENG/H	CAVS
104	0.5	R	E c/u 104	ENG/H	CAVS
105	1.25	B	E c/u 105	(101)	CAVS
106	0.5	BrW	E c/u 106	(102)	CAVS
107	0.5	Or	E c/u 107	ENG/H	CAVS
108	0.5	Y	E c/u 108	ENG/H	CAVS
201	0.5	BW	V c/u 1	ENG/H	CAVS
202	0.5	BG	V c/u 2	ENG/H	CAVS
203	0.5	BrR	V c/u 3	ENG/H	CAVS
206	0.5	BL	V c/u 6	Dr.EX 3	CAVS
207	0.5	RB	V c/u 7	Dr.EX 2	CAVS
208	0.5	BY	V c/u 8	ENG/H	CAVS
209	0.5	WB	V c/u 9	ENG/H	CAVS
210	0.5	BrG	V c/u 10	ENG/H	CAVS
213	0.5	BG	V c/u 13	Dr.EX 1	CAVS
215	0.5	BP	V c/u 15	Dr.EX 4	CAVS
216	0.5	LOr	V c/u 16	ENG/H	CAVS
217	0.5	LB	V c/u 17	ENG/H	CAVS
218	0.5	BY	V c/u 18	ENG/H	CAVS
220	0.5	GrL	V c/u 20	RELAY/H 1	CAVS
221	0.5	BY	V c/u 21	RELAY/H 1	CAVS
222	0.5	YB	V c/u 22	ENG/H	CAVS
223	0.5	L	V c/u 23	D10-A	CAVS
224	0.5	LG	V c/u 24	ENG/H	CAVS
225	0.5	LW	V c/u 25	ENG/H	CAVS
227	0.5	GrR	V c/u 27	RELAY/H 1	CAVS
228	0.5	BR	V c/u 28	RELAY/H 1	CAVS
229	0.5	LOr	V c/u 29	Pow.Boost SW	CAVS
230	0.5	WR	V c/u 30	ENG/H	CAVS
231	0.5	GB	V c/u 31	ENG/H	CAVS
232	0.5	G	V c/u 32	ENG/H	CAVS
233	0.5	W	V c/u 33	ENG/H	CAVS
234	0.5	GOr	V c/u 34	ENG/H	CAVS
235	0.5	RW	V c/u 35	ENG/H	CAVS
236	0.5	Y	V c/u 36	EX3-1 2	CAVS
237	0.5	YG	V c/u 37	FUSE 8	CAVS
238	0.5	B	V c/u 38	(25)	CAVS
239	0.5	BrY	V c/u 39	(24)	CAVS
240	0.5	RY	V c/u 40	ENG/H	CAVS
241	0.5	G	V c/u 41	ENG/H	CAVS
242	0.5	RG	V c/u 42	ENG/H	CAVS
243	0.5	RY	V c/u 43	ENG/H	CAVS
244	0.5	YL	V c/u 44	ENG/H	CAVS

NO.	SIZE	COLOR	CIRCUIT FROM	CIRCUIT TO	COMENT
246	0.5	YG	V c/u 46	(237)	CAVS
247	0.5	B	V c/u 47	(25)	CAVS
248	0.5	BrY	(239)	V c/u 48	CAVS
301	1.25	B	V c/u 101	(101)	CAVS
302	0.5	BrR	V c/u 102	FUSE 9	CAVS
306	0.5	RB	V c/u 106	ENG/H	CAVS
307	0.5	RY	V c/u 107	ENG/H	CAVS
309	1.25	B	V c/u 109	(101)	CAVS
310	0.5	BrR	V c/u 110	(302)	CAVS
312	0.5	OrL	V c/u 112	ENG/H	CAVS
314	0.5	RL	V c/u 114	ENG/H	CAVS
315	0.5	WG	V c/u 115	ENG/H	CAVS
317	0.5	GOr	(234)	ENG/H	CAVS
355	0.5	BrR	(302)	ENG/H	CAVS
362	0.5	BW	RELAY/H 3	FUSE 3	CAVS
364	Seald	Wire	(101)	ENG/H	単線
401	0.5	RL	RELAY/H 1	D16-A	CAVS
402	0.5	WY	RELAY/H 1	ENG/H	CAVS
403	0.5	GL	RELAY/H 1	ENG/H	CAVS
406	0.5	P	RELAY/H 1	Limit SW 2	CAVS
407	0.5	WB	RELAY/H 1	ENG/H	CAVS
408	0.5	L	RELAY/H 1	ENG/H	CAVS
409	0.5	G	RELAY/H 1	ENG/H	CAVS
410	0.5	WL	RELAY/H 1	ENG/H	CAVS
429	0.5	YG	RELAY/H 2	(237)	CAVS
431	0.5	GY	RELAY/H 2	D5-K	CAVS
434	0.5	YL	RELAY/H 2	Eng.Control Dial 1	CAVS
435	0.5	YR	RELAY/H 2	Eng.Control Dial 3	CAVS
438	0.5	YW	RELAY/H 2	Eng.Control Dial 2	CAVS
439	0.5	R	RELAY/H 2	FUSE 4	CAVS
442	0.5	LY	RELAY/H 3	ENG/H	CAVS
446	0.5	Br	RELAY/H 2	ENG/H	CAVS
447	0.5	RG	RELAY/H 2	ENG/H	CAVS
500	5	B	RELAY/H 5	Floor GND	AVS
501	3	B	(500)	ENG/H	AVS
515	0.85	BrB	ENG/H	FUSE 5	AVS
531	3	R	ENG/H	Stater SW 1	AVS
534	3	RW	FUSE 16 +	Stater SW 4	AVS
535	2	RB	D6-A	Stater SW 5	AVS
536	2	BW	FUSE 1 +	Stater SW 6	AVS
537	2	RW	D6-K	ENG/H	AVS
548	8/5	W	FUSE 13 +	ENG/H	AV FUSE BOX 右ﾋｭｰｽﾞBOX
549	2	RB	(535)	FUSE 5 +	AVS
550	0.5	R	(531)	RELAY/H 2	CAVS
552	0.5	RW	(537)	RELAY/H 2	CAVS
553	2	RG	FUSE 13	RELAY/H 4	AVS
557	2	Y	ENG/H	RELAY/H 4	AVS
558	2	RL	ENG/H	RELAY/H 4	AVS
563	0.5	YG	(429)	RELAY/H 3	CAVS
564	2	RL	OPT.Light 2	RELAY/H 4	AVS
566	2	RW	FUSE 18	RELAY/H 4	AVS
568	0.5	P	Horn SW(Fe.)	RELAY/H 3	CAVS
569	0.5	B	Horn SW(Fe.)	(500)	CAVS
570	0.85	RG	RELAY/H 4	ENG/H	CAVS
572	0.5	L	FUSE 12	RELAY/H 2	CAVS
593	0.5	LY	ENG/H	RELAY/H 2	CAVS
595	0.85	BrR	FUSE 17	Room Lamp	CAVS
596	0.5	LgW	Speaker R +	RADIO FM 3	CAVS
597	0.5	LgB	Speaker R -	RADIO FM 9	CAVS
598	0.5	LgY	Speaker L +	RADIO FM 4	CAVS
599	0.5	LgR	Speaker L -	RADIO FM 10	CAVS
600	0.5	B	(500)	RADIO FM 7	CAVS
602	0.5	R	(439)	RADIO FM 6	CAVS
610	0.5	WY	FUSE 7	Air Con./C 1	CAVS
611	3	R	(531)	FUSE 4 +	AVS
612	5	W	(548)	FUSE 10 +	AVS ⇒Diver.from 8
613	3	W	(548)	FUSE 11 +	AVS ⇒Diver.from 8
614	3	W	(548)	FUSE 20 +	AVS ⇒Diver.from 8
620	1.25	Br	FUSE 16	RELAY/H 5	CAVS
621	0.5	BrR	(595)	RADIO FM 2	CAVS
625	2	W	(548)	FUSE 14 +	AVS
630	0.85	R	FUSE 15 +	(531)	CAVS
631	0.85	L	FUSE 15	ENG/H	CAVS

NO.	SIZE	COLOR	CIRCUIT FROM	CIRCUIT TO	COMMENT
633	0.5	BrB	(515)	RELAY/H 3	CAVS
635	0.5	YL	ENG/H	RELAY/H 3	CAVS
636	0.5	Sb	ENG/H	RELAY/H 3	CAVS
637	0.5	BW	ENG/H	RELAY/H 3	CAVS
640	0.85	YW	FUSE 19	ENG/H	CAVS
644	0.85	B	Motion Alarm SW	(500)	CAVS
645	0.85	YL	Motion Alarm SW	ENG/H	CAVS
676	1.25	Y	FUSE 10	ENG/H	CAVS
677	0.5	WL	ENG/H	D10-K	CAVS
678	0.5	WL	(677)	D11-K	CAVS
679	0.5	G	ENG/H	D11-A	CAVS
681	0.5	BrR	(302)	D9-K	CAVS
682	0.5	OrL	(312)	D9-A	CAVS
684	0.5	L	(859)	D12-K	CAVS
685	0.5	B	(500)	D12-A	CAVS
686	0.5	WG	(21)	EX2-1 1	CAVS
687	0.5	WB	(35)	EX2-1 3	CAVS
689	0.5	LR	EX2-2 2	EX2-2 3	CAVS
690	0.5	YW	(438)	Eng.Control Dial 4	CAVS
691	0.5	B	(25)	Eng.Control Dial 6	CAVS
692	0.5	Y	(557)	Eng.Control Dial 7	CAVS
693	0.5	WB	(35)	Eng.Control Dial 8	CAVS
694	0.5	WG	(21)	Eng.Control Dial 10	CAVS
700	0.5	WY	Blower Main Relay 1	(610)	CAVS
701	0.5	G	Blower Main Relay 2	Air Con./C 2	CAVS
702	1.25	RW	Blower Main Relay 3	Blower Motor 2	CAVS
703	2	Br	Blower Main Relay 4	FUSE 11	AVS
706	1.25	B	Blower Hi.Relay 3	(500)	CAVS
707	1.25	BR	Blower Hi.Relay 4	Blower Motor 1	CAVS
708	0.5	WY	Blower Hi.Relay 1	(700)	CAVS
709	0.5	YL	Blower Hi.Relay 2	Air Con./C 5	CAVS
712	1.25	B	Blower Mid.Relay 2 - 3	(706)	CAVS
713	1.25	LR	Blower Mid.Relay 2 - 4	Blower Resistor 2	CAVS
714	0.5	WY	Blower Mid.Relay 2 - 1	(700)	CAVS
715	0.5	L	Blower Mid.Relay 2 - 2	Air Con./C 4	CAVS
718	1.25	B	Blower Mid.Relay 1 - 3	(706)	CAVS
719	1.25	WR	Blower Mid.Relay 1 - 4	Blower Resistor 3	CAVS
720	0.5	WY	Blower Mid.Relay 1 - 1	(700)	CAVS
721	0.5	W	Blower Mid.Relay 1 - 2	Air Con./C 3	CAVS
724	1.25	W	Compress.Relay 3	ENG/H	CAVS
725	1.25	Br	Compress.Relay 4	(703)	CAVS
726	0.5	WY	Compress.Relay 1	(700)	CAVS
727	0.5	BrW	Compress.Relay 2	Dual Press. SW 2	CAVS
730	0.5	P	Air Con./C 6	Dual Press. SW 1	CAVS
731	0.5	LG	Air Con./C 21	Sircu.Servo Motor 1	CAVS
732	0.5	GR	Air Con./C 22	Sircu.Servo Motor 2	CAVS
733	0.5	B	Air Con./C 14	(706)	CAVS
734	1.25	B	Blower Resistor 4	(706)	CAVS
735	1.25	BR	Blower Resistor 1	(707)	CAVS
736	0.5	BrR	Bent.Servo Motor 5	Air Con./C 13	CAVS
737	0.5	Or	Bent.Servo Motor 3	Air Con./C 11	CAVS
738	0.5	Lg	Bent.Servo Motor 4	Air Con./C 23	CAVS
739	0.5	BG	Bent.Servo Motor 2	Air Con./C 18	CAVS
740	0.5	RY	Bent.Servo Motor 1	Air Con./C 17	CAVS
741	0.5	BrR	A/M Servo Motor 5	(736)	CAVS
742	0.5	RW	A/M Servo Motor 3	Air Con./C 10	CAVS
743	0.5	GW	A/M Servo Motor 4	Air Con./C 16	CAVS
744	0.5	BL	A/M Servo Motor 2	Air Con./C 20	CAVS
745	0.5	RL	A/M Servo Motor 1	Air Con./C 19	CAVS
746	0.5	BrR	Thermister 1	(736)	CAVS
747	0.5	PG	Thermister 2	Air Con./C 9	CAVS
750	2	BW	FUSE 1	ENG/H	AVS
751	2	RW	FUSE 18 +	(534)	AVS

NO.	SIZE	COLOR	CIRCUIT FROM	CIRCUIT TO	COMENT
758	0.5	RW	(235)	ENG/H	CAVS
759	0.5	RY	(243)	ENG/H	CAVS
760	0.5	G	(241)	ENG/H	CAVS
762	0.5	WB	(35)	ENG/H	CAVS
763	0.5	RW	(235)	EX3-1 1	CAVS
764	0.5	RY	(243)	EX3-1 3	CAVS
765	0.5	LR	EX3-2 2	EX3-2 3	CAVS
766	2	R	FUSE 20	Aux.+	AVS
767	2	B	(500)	Aux.-	AVS
768	0.5	R	(766)	D7-K	CAVS
769	0.5	B	(767)	D7-A	CAVS
804	2	RY	OPT.Light 1	FUSE 14	AVS
829	0.5	B	(25)	Limit SW 1	CAVS
831	0.5	YL	D16-K	ENG/H	CAVS
832	0.5	YL	D17-K	(831)	CAVS
833	0.5	LY	D17-A	(33)	CAVS
834	0.5	W	D18-K	(724)	CAVS
835	0.5	B	D18-A	(500)	CAVS
850	0.85	Y	Stater SW 2	Preheat Relay 1 - 1	CAVS
851	0.85	L	Stater SW 3	Preheat Relay 2 - 1	CAVS
852	3	R	Preheat Relay 1	(531)	AVS
853	3	R	Preheat Relay 2	(852)	AVS
854	0.85	B	Preheat Relay 1 - 2	(500)	CAVS
855	0.85	B	Preheat Relay 2 -2	(854)	CAVS
856	3	BL	Preheat Relay 1	Resistor 1	AVS
857	3	BY	Preheat Relay 2	(858)	AVS
858	3	BY	Resistor 2	ENG/H	AVS
859	0.85	L	(851)	ENG/H	CAVS
860	2	B	OPT.Light 3	(500)	AVS
862	0.5	BrB	E c/u 29	ENG/H	CAVS
863	0.5	BrR	D19-K	(850)	CAVS
864	0.5	BrB	D19-A	(854)	CAVS
865	0.5	GY	D5-A	(850)	CAVS
866	0.5	L	D4-A	(851)	CAVS
867	0.5	GY	(431)	D4-K	CAVS
868	0.85	Br	HEATER	(703)	CAVS
869	0.85	B	HEATER	(500)	CAVS

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