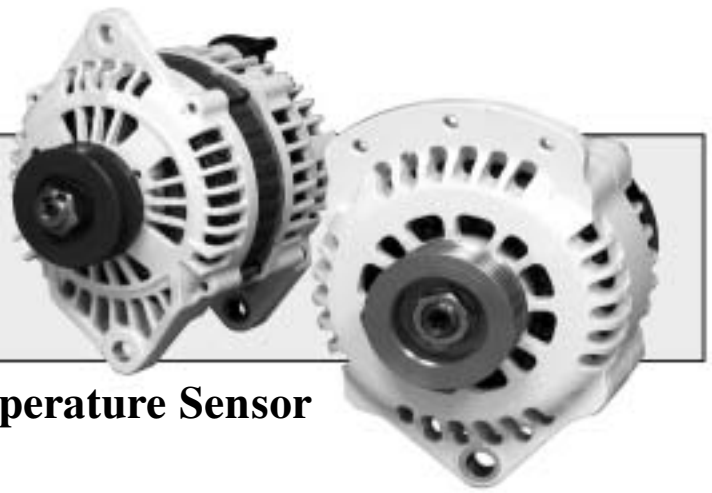


BALMAR[®]

WWW.BALMAR.NET



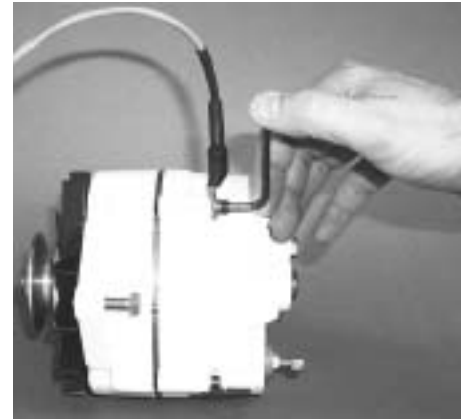
Optional Alternator And Battery Temperature Sensor Installation Instructions

Alternator Temperature Sensor (MC-TS-A)

With the Alternator Temperature Sensor installed, the Max Charge and ARS-4 voltage regulators can monitor the alternator and respond if ambient temperature conditions are detected. Once an over-temperature condition is detected, the regulator will reduce alternator field current to 50%. This will reduce the amperage output and horsepower load on the engine and belts, thus, giving the alternator an opportunity to cool to normal operating temperatures.

At the same time, the regulator will send the Dash Lamp terminal to ground, allowing the operator to identify a potential system problem if a dash warning light or audible alarm are used in conjunction with the Dash Lamp circuit. To install the Alternator Temperature Sensor:

1. Attach the thermister lug to one of the four mid-case mounting bolts as shown in the image at right.
2. Using cable ties, attach the length of the sensor cable to the regulator wiring harness.
3. Plug the positive (red) and negative (black) sensor leads into the Alternator Temperature Sensor terminal pins on the regulator (as indicated by the legend on the side of the regulator). Use care to match polarity as indicated.



Battery Temperature Sensor (MC-TS-B)

In addition to its ability to completely discontinue charging when a thermal runaway condition is detected at your battery, the regulator can also modify charging voltage to compensate for smaller changes in ambient battery temperatures (temperature compensation is only available on Battery #1 terminals – battery #2 terminals react only to over-temperature conditions).

In addition to shutting down charging in a catastrophic over-temperature condition, the regulator will send the Dash Lamp terminal to ground, allowing the operator to identify a potential system problem if a dash warning light or audible alarm are used in conjunction with the Dash Lamp circuit. To install the Battery Temperature Sensor:

1. Attach the thermister lug to the battery's negative post as shown in the image at right. If the bank has multiple batteries connected in parallel, mount the lug on the negative terminal closest to the center of the battery bank.
2. Feed the Battery Temperature Sensor cable from the battery to the regulator. The cable is 20' long to reach batteries located away from the alternator and regulator.
3. Plug the positive (red) and negative (black) sensor leads into the Battery Temperature Sensor terminal pins on the regulator (as indicated by the legend on the side of the regulator). Use care to match polarity as indicated. If only one Battery Temperature Sensor is used, ensure that the sensor terminals are connected to the Battery #1 terminal pins at the regulator.



BALMAR[®]
WWW.BALMAR.NET

19009 61st Ave. NE #4
Arlington, WA 98223
Phone: 360-435-6100

Balmar Battery Temperature Compensation Chart

Bat Temp In Deg F	Bat Temp In Deg C	Delta Temp	Delta temp counts	Flooded Voltage Correction	Volts @ 0o C 2.7315	Lifeline AGM Voltage Correction	EP AGM Voltage Correction	Gel Voltage Correction
-40	-40	-65	32.5	2.34	2.3315	1.4625	2.071875	1.95
-38.2	-39	-64	32	2.304	2.3415	1.44	2.04	1.92
-36.4	-38	-63	31.5	2.268	2.3515	1.4175	2.008125	1.89
-34.6	-37	-62	31	2.232	2.3615	1.395	1.97625	1.86
-32.8	-36	-61	30.5	2.196	2.3715	1.3725	1.944375	1.83
-31	-35	-60	30	2.16	2.3815	1.35	1.9125	1.8
-29.2	-34	-59	29.5	2.124	2.3915	1.3275	1.880625	1.77
-27.4	-33	-58	29	2.088	2.4015	1.305	1.84875	1.74
-25.6	-32	-57	28.5	2.052	2.4115	1.2825	1.816875	1.71
-23.8	-31	-56	28	2.016	2.4215	1.26	1.785	1.68
-22	-30	-55	27.5	1.98	2.4315	1.2375	1.753125	1.65
-20.2	-29	-54	27	1.944	2.4415	1.215	1.72125	1.62
-18.4	-28	-53	26.5	1.908	2.4515	1.1925	1.689375	1.59
-16.6	-27	-52	26	1.872	2.4615	1.17	1.6575	1.56
-14.8	-26	-51	25.5	1.836	2.4715	1.1475	1.625625	1.53
-13	-25	-50	25	1.8	2.4815	1.125	1.59375	1.5
-11.2	-24	-49	24.5	1.764	2.4915	1.1025	1.561875	1.47
-9.4	-23	-48	24	1.728	2.5015	1.08	1.53	1.44
-7.6	-22	-47	23.5	1.692	2.5115	1.0575	1.498125	1.41
-5.8	-21	-46	23	1.656	2.5215	1.035	1.46625	1.38
-4	-20	-45	22.5	1.62	2.5315	1.0125	1.434375	1.35
-2.2	-19	-44	22	1.584	2.5415	0.99	1.4025	1.32
-0.4	-18	-43	21.5	1.548	2.5515	0.9675	1.370625	1.29
1.4	-17	-42	21	1.512	2.5615	0.945	1.33875	1.26
3.2	-16	-41	20.5	1.476	2.5715	0.9225	1.306875	1.23
5	-15	-40	20	1.44	2.5815	0.9	1.275	1.2
6.8	-14	-39	19.5	1.404	2.5915	0.8775	1.243125	1.17
8.6	-13	-38	19	1.368	2.6015	0.855	1.21125	1.14
10.4	-12	-37	18.5	1.332	2.6115	0.8325	1.179375	1.11
12.2	-11	-36	18	1.296	2.6215	0.81	1.1475	1.08
14	-10	-35	17.5	1.26	2.6315	0.7875	1.115625	1.05
15.8	-9	-34	17	1.224	2.6415	0.765	1.08375	1.02
17.6	-8	-33	16.5	1.188	2.6515	0.7425	1.051875	0.99
19.4	-7	-32	16	1.152	2.6615	0.72	1.02	0.96
21.2	-6	-31	15.5	1.116	2.6715	0.6975	0.988125	0.93
23	-5	-30	15	1.08	2.6815	0.675	0.95625	0.9
24.8	-4	-29	14.5	1.044	2.6915	0.6525	0.924375	0.87
26.6	-3	-28	14	1.008	2.7015	0.63	0.8925	0.84
28.4	-2	-27	13.5	0.972	2.7115	0.6075	0.860625	0.81
30.2	-1	-26	13	0.936	2.7215	0.585	0.82875	0.78
32	0	-25	12.5	0.9	2.7315	0.5625	0.796875	0.75
33.8	1	-24	12	0.864	2.7415	0.54	0.765	0.72
35.6	2	-23	11.5	0.828	2.7515	0.5175	0.733125	0.69
37.4	3	-22	11	0.792	2.7615	0.495	0.70125	0.66
39.2	4	-21	10.5	0.756	2.7715	0.4725	0.669375	0.63

41	5	-20	10	0.72	2.7815	0.45	0.6375	0.6
42.8	6	-19	9.5	0.684	2.7915	0.4275	0.605625	0.57
44.6	7	-18	9	0.648	2.8015	0.405	0.57375	0.54
46.4	8	-17	8.5	0.612	2.8115	0.3825	0.541875	0.51
48.2	9	-16	8	0.576	2.8215	0.36	0.51	0.48
50	10	-15	7.5	0.54	2.8315	0.3375	0.478125	0.45
51.8	11	-14	7	0.504	2.8415	0.315	0.44625	0.42
53.6	12	-13	6.5	0.468	2.8515	0.2925	0.414375	0.39
55.4	13	-12	6	0.432	2.8615	0.27	0.3825	0.36
57.2	14	-11	5.5	0.396	2.8715	0.2475	0.350625	0.33
59	15	-10	5	0.36	2.8815	0.225	0.31875	0.3
60.8	16	-9	4.5	0.324	2.8915	0.2025	0.286875	0.27
62.6	17	-8	4	0.288	2.9015	0.18	0.255	0.24
64.4	18	-7	3.5	0.252	2.9115	0.1575	0.223125	0.21
66.2	19	-6	3	0.216	2.9215	0.135	0.19125	0.18
68	20	-5	2.5	0.18	2.9315	0.1125	0.159375	0.15
69.8	21	-4	2	0.144	2.9415	0.09	0.1275	0.12
71.6	22	-3	1.5	0.108	2.9515	0.0675	0.095625	0.09
73.4	23	-2	1	0.072	2.9615	0.045	0.06375	0.06
75.2	24	-1	0.5	0.036	2.9715	0.0225	0.031875	0.03
77	25	0	0	0	2.9815	0	0	0
78.8	26	1	-0.5	-0.036	2.9915	-0.0225	-0.031875	-0.03
80.6	27	2	-1	-0.072	3.0015	-0.045	-0.06375	-0.06
82.4	28	3	-1.5	-0.108	3.0115	-0.0675	-0.095625	-0.09
84.2	29	4	-2	-0.144	3.0215	-0.09	-0.1275	-0.12
86	30	5	-2.5	-0.18	3.0315	-0.1125	-0.159375	-0.15
87.8	31	6	-3	-0.216	3.0415	-0.135	-0.19125	-0.18
89.6	32	7	-3.5	-0.252	3.0515	-0.1575	-0.223125	-0.21
91.4	33	8	-4	-0.288	3.0615	-0.18	-0.255	-0.24
93.2	34	9	-4.5	-0.324	3.0715	-0.2025	-0.286875	-0.27
95	35	10	-5	-0.36	3.0815	-0.225	-0.31875	-0.3
96.8	36	11	-5.5	-0.396	3.0915	-0.2475	-0.350625	-0.33
98.6	37	12	-6	-0.432	3.1015	-0.27	-0.3825	-0.36
100.4	38	13	-6.5	-0.468	3.1115	-0.2925	-0.414375	-0.39
102.2	39	14	-7	-0.504	3.1215	-0.315	-0.44625	-0.42
104	40	15	-7.5	-0.54	3.1315	-0.3375	-0.478125	-0.45
105.8	41	16	-8	-0.576	3.1415	-0.36	-0.51	-0.48
107.6	42	17	-8.5	-0.612	3.1515	-0.3825	-0.541875	-0.51
109.4	43	18	-9	-0.648	3.1615	-0.405	-0.57375	-0.54
111.2	44	19	-9.5	-0.684	3.1715	-0.4275	-0.605625	-0.57
113	45	20	-10	-0.72	3.1815	-0.45	-0.6375	-0.6
114.8	46	21	-10.5	-0.756	3.1915	-0.4725	-0.669375	-0.63
116.6	47	22	-11	-0.792	3.2015	-0.495	-0.70125	-0.66
118.4	48	23	-11.5	-0.828	3.2115	-0.5175	-0.733125	-0.69
120.2	49	24	-12	-0.864	3.2215	-0.54	-0.765	-0.72
122	50	25	-12.5	-0.9	3.2315	-0.5625	-0.796875	-0.75
123.8	51	26	-13	-0.936	3.2415	-0.585	-0.82875	-0.78
125.6	52	27	-13.5	-0.972	3.2515	-0.6075	-0.860625	-0.81
127.4	53	28	-14	-1.008	3.2615	-0.63	-0.8925	-0.84
129.2	54	29	-14.5	-1.044	3.2715	-0.6525	-0.924375	-0.87
131	55	30	-15	-1.08	3.2815	-0.675	-0.95625	-0.9

132.8	56	31	-15.5	-1.116	3.2915	-0.6975	-0.988125	-0.93
134.6	57	32	-16	-1.152	3.3015	-0.72	-1.02	-0.96
136.4	58	33	-16.5	-1.188	3.3115	-0.7425	-1.051875	-0.99
138.2	59	34	-17	-1.224	3.3215	-0.765	-1.08375	-1.02
140	60	35	-17.5	-1.26	3.3315	-0.7875	-1.115625	-1.05
141.8	61	36	-18	-1.296	3.3415	-0.81	-1.1475	-1.08
143.6	62	37	-18.5	-1.332	3.3515	-0.8325	-1.179375	-1.11
145.4	63	38	-19	-1.368	3.3615	-0.855	-1.21125	-1.14
147.2	64	39	-19.5	-1.404	3.3715	-0.8775	-1.243125	-1.17
149	65	40	-20	-1.44	3.3815	-0.9	-1.275	-1.2
150.8	66	41	-20.5	-1.476	3.3915	-0.9225	-1.306875	-1.23
152.6	67	42	-21	-1.512	3.4015	-0.945	-1.33875	-1.26
154.4	68	43	-21.5	-1.548	3.4115	-0.9675	-1.370625	-1.29
156.2	69	44	-22	-1.584	3.4215	-0.99	-1.4025	-1.32
158	70	45	-22.5	-1.62	3.4315	-1.0125	-1.434375	-1.35
159.8	71	46	-23	-1.656	3.4415	-1.035	-1.46625	-1.38
161.6	72	47	-23.5	-1.692	3.4515	-1.0575	-1.498125	-1.41
163.4	73	48	-24	-1.728	3.4615	-1.08	-1.53	-1.44
165.2	74	49	-24.5	-1.764	3.4715	-1.1025	-1.561875	-1.47
167	75	50	-25	-1.8	3.4815	-1.125	-1.59375	-1.5
168.8	76	51	-25.5	-1.836	3.4915	-1.1475	-1.625625	-1.53
170.6	77	52	-26	-1.872	3.5015	-1.17	-1.6575	-1.56
172.4	78	53	-26.5	-1.908	3.5115	-1.1925	-1.689375	-1.59
174.2	79	54	-27	-1.944	3.5215	-1.215	-1.72125	-1.62
176	80	55	-27.5	-1.98	3.5315	-1.2375	-1.753125	-1.65
177.8	81	56	-28	-2.016	3.5415	-1.26	-1.785	-1.68
179.6	82	57	-28.5	-2.052	3.5515	-1.2825	-1.816875	-1.71
181.4	83	58	-29	-2.088	3.5615	-1.305	-1.84875	-1.74
183.2	84	59	-29.5	-2.124	3.5715	-1.3275	-1.880625	-1.77
185	85	60	-30	-2.16	3.5815	-1.35	-1.9125	-1.8
186.8	86	61	-30.5	-2.196	3.5915	-1.3725	-1.944375	-1.83
188.6	87	62	-31	-2.232	3.6015	-1.395	-1.97625	-1.86
190.4	88	63	-31.5	-2.268	3.6115	-1.4175	-2.008125	-1.89
192.2	89	64	-32	-2.304	3.6215	-1.44	-2.04	-1.92
194	90	65	-32.5	-2.34	3.6315	-1.4625	-2.071875	-1.95
195.8	91	66	-33	-2.376	3.6415	-1.485	-2.10375	-1.98
197.6	92	67	-33.5	-2.412	3.6515	-1.5075	-2.135625	-2.01
199.4	93	68	-34	-2.448	3.6615	-1.53	-2.1675	-2.04
201.2	94	69	-34.5	-2.484	3.6715	-1.5525	-2.199375	-2.07
203	95	70	-35	-2.52	3.6815	-1.575	-2.23125	-2.1
204.8	96	71	-35.5	-2.556	3.6915	-1.5975	-2.263125	-2.13
206.6	97	72	-36	-2.592	3.7015	-1.62	-2.295	-2.16
208.4	98	73	-36.5	-2.628	3.7115	-1.6425	-2.326875	-2.19
210.2	99	74	-37	-2.664	3.7215	-1.665	-2.35875	-2.22
212	100	75	-37.5	-2.7	3.7315	-1.6875	-2.390625	-2.25