Delco-Remy
DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

BULLETIN NO. 1R-186
DATE 3-1-68
12 PAGES PAGE 1
SUPPLEMENTS
Bulletins 1R-180 and 1R-185
Dated 11-1-65
SUPERSEDES
Bulletin 1R-186, Dated 4-1-66

SERVICE TEST SPECIFICATIONS

REGULATORS

Because of important differences in wiring circuits, design, and operation, Delco-Remy regulators have been classified by groups and identified by table number. If important instructions relating to a particular type of regulator are given, read and follow them carefully to insure accurate results.

Table 1—Standard Regulators
Table 2—Standard Tractor Type Regulators
Table 3—Standard Regulators (Double Contact Type)
Table 4—Standard Regulator (Double Contact Type Used With "Delcotron" Generators)
Table 5—Heavy Duty Regulators (3 and 4 Unit)
Table 6—Step-Voltage Controls
Table 7—Transistorized Regulators (With Field Relay)
Table 8—Transistorized Regulators (With Indicator Light Relay)
Table 9—Transistorized Regulators
Table 10–Transistor Regulators

The specifications listed in this bulletin apply only when regulators are tested under service conditions and according to the methods recommended in the applicable service bulletin.

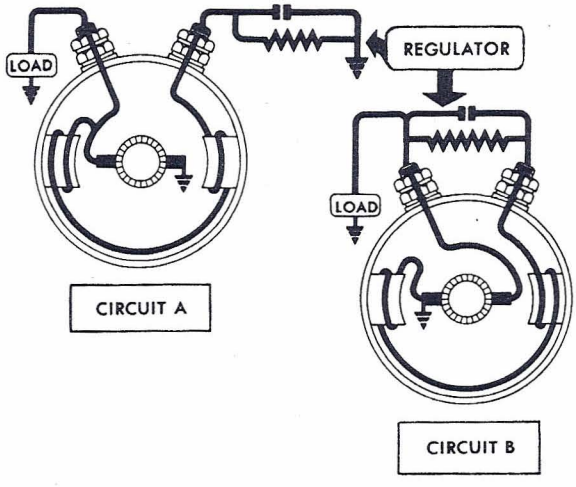
No attempt should be made to substitute regulators on the basis of similarity of test specifications. Regulators are designed to operate with specific generators and should be used only as shown by application information.

REGULATOR CIRCUITS

Two different circuits are used for Delco-Remy regulators; the "A" circuit and the "B" circuit. These regulators are entirely different and must always be used with generators of the corresponding circuits.

"A" Circuit: The field resistance and contact points of the regulator are connected between the field terminal of the generator and ground so that the generator field is grounded through the regulator.

"B" Circuit: The field resistance and contact points of the regulator are connected between the field terminal and main terminal of the generator so that the field circuit is insulated in the regulator and grounded in the generator.



The same two circuits are used for insulated regulators except that a return wire is used between the regulator and generator instead of a ground return.

POLARITY

All regulators are designed for a specific polarity, as indicated in the test specifications. The regulator contacts will be severely damaged if the regulator is connected to a system of opposite polarity.

RELAYS

Separate relays that are not a part of the regulator should be checked in accordance with service bulletin 1R-100. If the relay should fail, it should be serviced by complete replacement.

Delco-Remy

REGULATORS

TABLE 1 STANDARD REGULATOR SERVICE TEST SPECIFICATIONS

Test specifications for regulators with a "B", "C", "D" or "E" suffix following the model number are the same as for the basic model listed below. Checking procedures, when they differ from the basic model, are explained in the bulletin listed in the footnotes.

Generally speaking, a voltage regulator setting any place within the normal range shown is satisfactory if (1) the battery remains satisfactorily charged without an excessive use of water and (2) there is no evidence of damage to lights or other voltage-sensitive equipment. If water consumption in the battery exceeds one ounce per cell each 1,000 miles, lower the voltage regulator setting. Raise the voltage regulator setting if the battery consistently remains undercharged. In either case the setting must be within the specified range.

On applications where no battery history is available, adjust the voltage regulator setting to a value about the middle of the normal range. Generally speaking, a setting slightly above the middle of the normal range will be satisfactory for most cars. However, a slightly lower setting will be more satisfactory for cars operated at high speeds or in warm climates. A slightly higher setting may be more satisfactory for cars normally operated at low speeds or in the cooler climates.

The voltage regulator unit must be set within the range given in the specification. When a range is not given and the chart number is indicated in the specification, the voltage regulator unit must be set in accordance with the temperature-voltage chart on page 6. The voltage regulator unit must be at operating temperature which is reached after 15 minutes of continuous operation, with 1/4 ohm resistance in series with the battery, and with the regulator cover in place. It is not necessary to measure the amount of current flowing during warm-up or testing of the voltage unit; however, it is important that no electrical load other than ignition be turned on during the test. (If a variable resistor is used in series with the battery, set to 1 - 10 amperes for warm-up period.)

Non-compensated current regulator units must be set within the range that is given. When the current regulator unit is temperature compensated it must be set in accordance with the temperature-current chart on page 6. The chart number is indicated in the specifications. The current regulator must also be stabilized by operating it for at least 15 minutes with cover in place. (Non-compensated current regulators operate the same, hot or cold. Operating temperature, therefore, may be disregarded.)

					CUTOUT RELAY			VOLTAGE REGULATOR		CURRENT REGULATOR	
Regulator Model	Service Bulletin	Circuit	Polarity	Spec. No.	†Air Gap (In.)	Point Opening (In.)	Closing Voltage Range	†Air Gap (In.)	Voltage Setting Range or Chart	†Air Gap (In.)	Current Setting Range or Chart
1118259	1R-115	A	N	2132	.020	.020	11.8-13.5	**	13.8-14.8	.075	11-13
1118263	1R-115	A	N	1598	.020	.020	11.8-13.5	**	13.8-14.8	.075	23-27
1118267	1R-115	A	N	1596	.020	.020	11.8-13.5	**	13.9-14.7	.075	33-37
1118325	1R-116	A	N	1596	.020	.020	11.8-13.5	**	13.9-14.7	.075	33-37
1118358	1R-116	A	N	1598	.020	.020	11.8-13.5	**	13.8-14.8	.075	23-27
1118383	1R-116(c)	A	N	2166	.020	.020	11.8-13.5	**	13.8-14.8	.075	11-13
1118384	1R-116(c)	A	N	2167	.020	.020	11.8-13.5	**	13.8-14.8	.075	23-27
1118385	1R-116(c)	A	N	1596	.020	.020	11.8-13.5	**	13.9-14.7	.075	33-37
1118386	1R-116(c)	A	N	2098	.017	.032	24-27	**	27.5-29.5	.075	13.5-16.5
1118423		B	N	3636(d)							
1118424	1R-116A(t)	A	P(i)	1524	.017	.032	24-27	**	27.5-29.5	.075	8.5-11.5
1118704	1R-116(c)	A	N	1596	.020	.020	11.8-13.5	**	13.9-14.7	.075	33-37
1118713	1R-116(c)	A	N	2168	.020	.020	11.8-13.5	**	13.9-14.7	.075	48-52
1118736	1R-116(c)	A	N	2165	.020	.020	11.8-13.5	**	13.9-14.7	.075	18.5-21.5
1118799	1R-116(c)	A	N	2122	.017	.032	24-27	**	27.5-29.5	.075	23-27
1118800	1R-116(c)	A	N(i)	1523	.017	.032	24-27	**	27.5-29.5	.075	18-22
1118840	1R-117	A	N	1579	.020	.020	11.8-13.5	**	13.8-14.5(h)	.075	33-37
1118882	1R-117	A	N	1594	.020	.020	11.8-13.5	**	13.8-14.8	.075	18.5-21.5
1118884	1R-117	A	N	1578	.020	.020	11.8-13.5	**	13.8-14.7	.075	48-52
1118892	1R-117	A	N	1596	.020	.020	11.8-13.5	**	13.9-14.7	.075	33-37

† Tolerance plus or minus 10%.
** Air gap is .075" for basic model and for model having a "B", "C", or "D" suffix. Air gap is .060" for model having an "E" suffix.
(c) For model without suffix "B", "C", "D" or "E", see Service Bulletin listed. For model with suffix "B", "C", or "D", see Service Bulletin 1R-116A. For model with suffix "E", see Service Bulletin 1R-118A.
(d) Voltage control unit air gap .055", point opening .015" min., opening voltage range 29-30.5, closing voltage 24 max.
(h) Paralleling: with no load on BAT. terminal, add 5 amp. load at P-terminal-- voltage regulator to operate 2-3 volts lower.
(i) Insulated.
(t) For model without suffix letter or for model with suffix "C", see Service Bulletin listed. For model with suffix "D", or "E", see Service Bulletin 1R-118A.

REGULATORS

TABLE 1 (CONTINUED) STANDARD REGULATOR SERVICE TEST SPECIFICATIONS

Test specifications for regulators with a "B", "C", "D" or "E" suffix following the model number are the same as for the basic model listed below. Checking procedures, when they differ from the basic model, are explained in the bulletin listed in the footnotes.

					CUTOUT RELAY			VOLTAGE REGULATOR		CURRENT REGULATOR	
Regulator Model	Service Bulletin	Cir-cuit	Po-larity	Spec. No.	†Air Gap (In.)	Point Open-ing (In.)	Closing Voltage Range	†Air Gap (In.)	Voltage Setting Range or Chart	†Air Gap (In.)	Current Setting Range or Chart
1118904	1R-117	A	N	1600	.020	.020	11.8-13.5	**	13.8-14.7	.075	18.5-21.5
1118949(b)	1R-117	A	N	2150	.017	.032	24-27	**	27.5-29.5	.075	14-16
1118951(b)	1R-117	A	N	2145	.017	.032	24-27	**	27.8-29.4	.075	23-27
1118976(b)	1R-116(c)	A	N	2145	.017	.032	24-27	**	27.8-29.4	.075	23-27
1119000	*	A	N	2146	.020	.020	11.8-13.5	**	No. 4	.075	No. 10
1119001	*	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119002	*	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119003	*	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119122	*	A	N	2146	.020	.020	11.8-13.5	**	No. 4	.075	No. 10
1119123	*	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119135	*	A	P	1600	.020	.020	11.8-13.5	**	No. 4	.075	18.5-21.5
1119136	1R-116(c)	A	P(i)	2098	.017	.032	24-27	**	27.5-29.5	.075	13.5-16.5
1119139(h)	1R-116A(c)	A	N	2171	.020	.020	11.8-13.5	**	No. 2(r)	.075	18.5-21.5
1119144(b)	1R-116A(c)	A	N	2150	.017	.032	24-27	**	27.5-29.5	.075	14-16
1119145(h)	1R-116A(c)	A	N	2172	.020	.020	11.8-13.5	**	13.8-14.8	.075	33-37
1119161(a)	1R-118	A	N	2180	.020	.020	11.8-13.5	**	No. 4(r)	.075	27-33
1119165	*	A	N	2184	.020	.020	11.8-13.5	**	No. 4	.075	13-15
1119168	*	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119173	*	A	P	1570	.020	.020	5.9-6.7	**	No. 5	.075	No. 13
1119174	*	A	P	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119176	*	A	P	1568	.020	.020	5.9-6.7	**	No. 5	.075	28-32
1119177	1R-116A(t)	A	P	2137	.017	.032	24-27	(u)	27.5-29.5	.075	16-20
1119178	1R-116A(t)	A	P(i)	2098	.017	.032	24-27	(u)	27.5-29.5	.075	13.5-16.5
1119179	1R-116A(t)	A	P(i)	1523	.017	.032	24-27	(u)	27.5-29.5	.075	18-22
1119180	*	A	P	2184	.020	.020	11.8-13.5	**	No. 4	.075	13-15
1119181	*	A	P	2189	.020	.020	11.8-13.5	**	No. 4	.075	22-26
1119182	*	A	N	2190	.020	.020	5.9-6.7(s)	**	7.4-7.9	.075	48-52
1119184	1R-116	A	N	2122	.017	.032	24-27	**	27.5-29.5	.075	23-27
1119185	1R-116A(t)	A	N(i)	1523	.017	.032	24-27	(u)	27.5-29.5	.075	18-22
1119187	*	A	N	2191	.020	.020	5.9-6.7	**	No. 5	.075	13.5-16.5
1119190	*	A	P	1595	.020	.020	11.8-13.5	**	No. 4	.075	38-42
1119192	*	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119199	1R-116A(t)	A	P(i)	2098	.017	.032	24-27	(u)	27.5-29.5	.075	13.5-16.5
1119200	*	A	N(i)	1578	.020	.020	11.8-13.5	**	No. 4	.075	48-52
1119201	1R-116A(t)	A	N	2122	.017	.032	24-27	**	27.5-29.5	.075	23-27
1119202	1R-116A(t)	A	N	1523	.017	.032	24-27	**	27.5-29.5	.075	18-22
1119203	1R-217	A	N	3206(j)(k)				**	No. 5		
1119204	1R-217	A	P	3206(j)(k)				**	No. 5		
1119205	*	A	N	2189	.020	.020	11.8-13.5	**	No. 4	.075	22-26
1119206	1R-116A(t)	A	N	2137	.017	.032	24-27	(u)	27.5-29.5	.075	16-20

† Tolerance plus or minus 10%.

* For model without suffix letter and for model followed by "C", see Service Bulletin 1R-118.
For model followed by "D" or "E", see Service Bulletin 1R-118A.

** Air gap is .075" for basic model and for model having a "B", "C", or "D" suffix.
Air gap is .060" for model having an "E" suffix.

(a) Paralleling: with 1/4 ohm resistance in series with battery, add 5 amp. load at P-terminal--voltage regulator to operate 1-2 volts lower.

(b) Paralleling: with no load on BAT. terminal, add 2.5 amp. load at P-terminal--voltage regulator to operate 2-3 volts lower.

(c) For model without suffix "B", "C", "D", or "E", see Service Bulletin listed.
For model with suffix "B", "C", or "D", see Service Bulletin 1R-116A.
For model with suffix "E", see Service Bulletin 1R-118A.

(h) Paralleling: with no load on BAT. terminal, add 5 amp. load at P-terminal--voltage regulator to operate 2-3 volts lower.

(i) Insulated.

(j) Circuit breaker air gaps .013", point opening .027". Relay closes 3.8-5.2 volts.

(k) Control relay air gap .035", point opening .025". Relay 3.8-5.2 volts.

(r) Check operating voltage with no current flow at the "P" terminal of the regulator.

(s) With regulator in 120 degrees F ambient air. For higher temperatures, subtract 1% per 10 degrees. For lower temperatures, add 1% per 10 degrees.

(t) For model without suffix letter or for model with suffix "C", see Service Bulletin listed.
For model with suffix "D" or "E", see Service Bulletin listed.

(u) Air gap is .075" for basic model and for model having a "C" suffix.
Air gap is .060" for model having a "D" or "E" suffix.

Delco-Remy

REGULATORS

TABLE 1 (CONTINUED) STANDARD REGULATOR SERVICE TEST SPECIFICATIONS

Test specifications for regulators with a "B", "C", "D" or "E" suffix following the model number are the same as for the basic model listed below. Checking procedures, when they differ from the basic model, are explained in the bulletin listed in the footnotes.

					CUTOUT RELAY			VOLTAGE REGULATOR		CURRENT REGULATOR	
Regulator Model	Service Bulletin	Circuit	Polarity	Spec. No.	†Air Gap (In.)	Point Opening (In.)	Closing Voltage Range	†Air Gap (In.)	Voltage Setting Range or Chart	†Air Gap (In.)	Current Setting Range or Chart
1119207	*	A	N	2184	.020	.020	11.8-13.5	**	No. 4	.075	13-15
1119209	*	A	N	2184	.020	.020	11.8-13.5	**	No. 4	.075	13-15
1119210	*	A	N	1590	.020	.020	5.9-6.7	**	No. 5	.075	16.5-19.5
1119211		A	P	3212				**	13.6-14.5		
1119212(a)	1R-117	A	N	3214	.020	.020	11.8-13.5	**	No. 4(r)	.075	No. 10
1119213	1R-116A(t)	A	N	1524	.017	.032	24-27	(u)	27.5-29.5	.075	8.5-11.5
1119214	1R-116A(t)	A	N	1524	.017	.032	24-27	**	27.5-29.5	.075	8.5-11.5
1119215	*	A	P	2131	.020	.020	11.8-13.5	**	No. 4	.075	14-16
1119216	1R-116A(t)	A	P	1523	.017	.032	24-27	**	27.5-29.5	.075	18-22
1119217	*	A	P	1588	.020	.020	5.9-6.7	**	No. 5	.075	23-27
1119218(b)	1R-116A(c)	A	N	2145	.017	.032	24-27	**	No. 3(r)	.075	23-27
1119219	1R-116A	A	P(i)	1524	.017	.032	24-27	**	27.5-29.5	.075	8.5-11.5
1119220	1R-116A(c)	A	N	1596	.020	.020	11.8-13.5	**	No. 2	.075	33-37
1119221	1R-116A(t)	A	N(i)	1523	.017	.032	24-27	(u)	27.5-29.5	.075	18-22
1119222	1R-118	A	N	2157	.020	.020	5.9-6.7	**	No. 5	.075	43-47
1119223	1R-116A(t)	A	P	2098	.017	.032	24-27	(u)	27.5-29.5	.075	13.5-16.5
1119224	1R-116A(t)	A	N	2168	.020	.020	11.8-13.5	**	No. 2	.075	48-52
1119225	1R-116A(t)	A	P(i)	3219	.017	.032	29-33	**	34.5-36.5	.075	8.5-11.5
1119226	1R-116A(c)	A	N	2165	.020	.020	11.8-13.5	**	No. 2	.075	18.5-21.5
1119232	*	A	N	1586	.020	.020	5.8-6.7	**	No. 5	.075	28-32
1119233	1R-116A(t)	A	N	2098	.017	.032	24-27	(u)	27.5-29.5	.075	13.5-16.5
1119234	*	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119235	*	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119236(f)	*	A	N	2158	.020	.020	11.8-13.5	**	No. 4	.075	53-57
1119237(b)	1R-116A(t)	A	N	3223	.017	.032	22.8-25.2	**	No. 7(r)	.075	38-42
1119238	*	A	P	2189	.020	.020	11.8-13.5	**	No. 4	.075	22-26
1119239	*	A	N	2189	.020	.020	11.8-13.5	**	No. 4	.075	22-26
1119240	1R-116A(t)	A	N(i)	2098	.017	.032	24-27	**	27.5-29.5	.075	13.5-16.5
1119241	*	A	N	1600	.020	.020	11.8-13.5	**	No. 4	.075	18.5-21.5
1119242	*	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119243	*	A	P	2184	.020	.020	11.8-13.5	**	No. 4	.075	13-15
1119244	1R-118A	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119245	*	A	N	3233	.020	.020	11.8-13.5	**	No. 4	.075	No. 11
1119246(h)	1R-116A(t)	A	N	3235	.020	.020	11.8-13.5	**	No. 2	.075	48-52
1119247	*	A	N	2189	.020	.020	11.8-13.5	**	No. 4	.075	22-26
1119248	1R-116A(t)	A	N(i)	3236	.017	.032	24-27	**	27.5-29.5	.075	23-27
1119249	1R-116A(t)	A	P	3238	.017	.032	31.3-35.3	**	36.8-38.8	.075	16-20
1119250	*	A	P	3233	.020	.020	11.8-13.5	**	No. 4	.075	No. 11
1119251	*	A	P	1589	.020	.020	5.9-6.7	**	No. 5	.075	17.5-20.5
1119252	*	A	P	3241	.020	.020	11.8-13.5	**	No. 4	.075	14.5-17.5

† Tolerance plus or minus 10%.

* For model without suffix letter and for model followed by "C", see Service Bulletin 1R-118. For model followed by "D" or "E", see Service Bulletin 1R-118A.

** Air gap is .075" for basic model and for model having a "B", "C", or "D" suffix. Air gap is .060" for model having an "E" suffix.

(a) Paralleling: with 1/4 ohm resistance in series with battery, add 5 amp. load at P-terminal-- voltage regulator to operate 1-2 volts lower.

(b) Paralleling: with no load on BAT. terminal, add 2.5 amp. load at P-terminal-- voltage regulator to operate 2-3 volts lower.

(c) For model without suffix "B", "C", "D", or "E", see Service Bulletin listed. For model with suffix "B", "C", or "D", see Service Bulletin 1R-116A. For model with suffix "E", see Service Bulletin 1R-118A.

(f) Paralleling voltage regulator setting must drop .4-.6V per 30 amperes battery load.

(h) Paralleling: with no load on BAT. terminal, add 5 amp. load at P-terminal-- voltage regulator to operate 2-3 volts lower.

(i) Insulated.

(r) Check operating voltage with no current flow at the "P" terminal of the regulator.

(t) For model without suffix letter or for model with suffix "C", see Service Bulletin listed. For model with suffix "D" or "E", see Service Bulletin 1R-118A.

(u) Air gap is .075" for basic model and for model having a "C" suffix. Air gap is .060" for model having a "D" or "E" suffix.

REGULATORS

TABLE 1 (CONTINUED) STANDARD REGULATOR SERVICE TEST SPECIFICATIONS

Test specifications for regulators with a "B", "C", "D" or "E" suffix following the model number are the same as for the basic model listed below. Checking procedures, when they differ from the basic model, are explained in the bulletin listed in the footnotes.

					CUTOUT RELAY			VOLTAGE REGULATOR		CURRENT REGULATOR	
Regulator Model	Service Bulletin	Circuit	Polarity	Spec. No.	†Air Gap (In.)	Point Opening (In.)	Closing Voltage Range	†Air Gap (In.)	Voltage Setting Range or Chart	†Air Gap (In.)	Current Setting Range or Chart
1119253	*	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119254	1R-116A	A	P	1524	.017	.032	24-27	**	27.5-29.5	.075	8.5-11.5
1119255	*	A	N	2134	.020	.020	11.8-13.5	**	No. 4	.075	8-9
1119256	1R-116A	A	P(i)	2137	.017	.032	24-27	**	27.5-29.5	.075	16-20
1119257	*	A	N	2140	.020	.020	11.8-13.5	**	No. 4	.075	15.5-18.5
1119258	*	A	P	2189	.020	.020	11.8-13.5	**	No. 4	.075	22-26
1119259	*	A	P	1590	.020	.020	5.9-6.7	**	No. 5	.075	16.5-19.5
1119260	*	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119261	1R-118A	A	N	3250(m)	.023	.020	No. 1	**	No. 4	.070	No. 8
1119262	1R-116A(t)	A	N	1524	.017	.032	24-27	(u)	27.5-29.5	.075	8.5-11.5
1119263	1R-118A	A	N	1568	.020	.020	11.8-13.5	**	No. 4	.075	No. 8
1119264	1R-118A	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119265	1R-217	A	P	3260(e)(g)				**	No. 6		
1119266	1R-118A	A	N	1595	.020	.020	11.8-13.5	**	No. 4	.075	38-42
1119267	1R-118A	A	P	1600	.020	.020	11.8-13.5	**	No. 4	.075	18.5-21.5
1119268	1R-116A	A	P(i)	1523	.017	.032	24-27	**	27.5-29.5	.075	18-22
1119269	1R-118A	A	N	2139	.020	.020	11.8-13.5	**	No. 4	.075	53-57
1119270	1R-118A	A	N	2146	.020	.020	11.8-13.5	**	No. 4	.075	No. 10
1119271	1R-118A	A	N	2139	.020	.020	11.8-13.5	**	No. 4	.075	53-57
1119272	1R-118A	A	P	1574	.020	.020	5.9-6.7	**	No. 5	.075	38-42
1119273	1R-116A(t)	A	N	3277	.017	.032	24-27	**	No. 3	.075	38-42
1119274	1R-118A	A	N	3233	.020	.020	11.8-13.5	**	No. 4	.075	No. 11
1119275	1R-118A	A	N	1595	.020	.020	11.8-13.5	**	No. 4	.075	38-42
1119276	1R-116A(t)	A	P(i)	3281	.017	.032	31.3-35.3	**	36.8-38.8	.075	8.5-11.5
1119277	1R-118A	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119278	1R-118A	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119279	1R-118A	A	P	2146	.020	.020	11.8-13.5	**	No. 4	.075	No. 10
1119280	1R-118A	A	P	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119281	1R-118A	A	N	1575	.020	.020	5.9-6.7	**	No. 4	.075	48-52
1119282	1R-116A	A	P(i)	1524	.017	.032	24-27	(u)	27.5-29.5	.075	8.5-11.5
1119285	1R-116A(t)	A	P(i)	2137	.017	.032	24-27	(u)	27.5-29.5	.075	16-20
1119286	1R-116A(t)	A	N	3238	.017	.032	31.3-35.3	**	36.8-38.8	.075	16-20
1119292	1R-116A(t)	A	N(i)	1598	.020	.020	11.8-13.5	**	13.8-14.8	.075	23-27
1119293	1R-116A	A	N(i)	2137	.017	.032	24-27	**	27.5-29.5	.075	16-20
1119294	1R-118A	A	N	4200	.020	.020	11.5-13	**	13.2-14.2(s)	.075	13-15
1119295	1R-116A(t)	A	N(i)	1524	.017	.032	24-27	(u)	27.5-29.5	.075	8.5-11.5
1119299	1R-118A	A	N	2155	.020	.020	11.8-13.5	**	No. 4	.075	No. 12
1119302	1R-118A	A	N	2133	.020	.020	11.8-13.5	**	13.8-14.8	.075	9-11
1119303	1R-118A	A	P	2139	.020	.020	11.8-13.5	**	No. 4	.075	53-57

† Tolerance plus or minus 10%.
* For model without suffix letter and for model followed by "C", see Service Bulletin 1R-118. For model followed by "D" or "E", see Service Bulletin 1R-118A.
** Air gap is .075" for basic model and for model having a "B", "C", or "D" suffix. Air gap is .060" for model having an "E" suffix.
(e) Circuit breaker air gap .013", point opening .027". Relay closes 7.5-10.5 volts.
(g) Control relay air gap .035", point opening .025". Relay closes 7.5-10.5 volts.
(i) Insulated.
(m) Relay to open at 1-4 amperes reverse current at 12.5 volts.
(s) With regulator in 120 degrees F ambient air. For higher temperatures, subtract 1% per 10 degrees. For lower temperatures, add 1% per 10 degrees.
(t) For model without suffix letter or for model with suffix "C", see Service Bulletin listed. For model with suffix "D" or "E", see Service Bulletin 1R-118A.
(u) Air gap is .075" for basic model and for model having a "C" suffix. Air gap is .060" for model having a "D" or "E" suffix.

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REGULATORS

TEMPERATURE-VOLTAGE CHARTS FOR TABLE 1

Regulator Ambient Temperature -- Degrees Fahrenheit	65	85	105	125	145	165	185
Cutout Relay Closing Voltage							
Chart # 1	12.2-13.8	12.1-13.7	11.8-13.4	11.5-13.1	11.2-12.8	11-12.5	10.7-12.2
Voltage Setting							
Chart # 2	14.7-15.7	14.4-15.4	14.2-15	13.9-14.7	13.5-14.3	13.1-13.9	12.7-13.5
Chart # 3	29.4-31.4	28.9-30.8	28.3-30.1	27.8-29.4			
Chart # 4	14.4-15.4	14.2-15.2	14-14.9	13.8-14.7	13.5-14.3	13.1-13.9	
Chart # 5	7.2-7.7	7.1-7.6	7-7.5	6.9-7.3	6.7-7.1	6.5-6.9	
Chart # 6	14-15.1	13.8-14.8	13.6-14.4	13.3-14.1	12.9-13.7	12.5-13.3	12.1-12.9
Chart # 7	27.4-29.5	27.1-29	26.8-28.6	26.5-28.1			

TEMPERATURE-CURRENT CHARTS FOR TABLE 1

Regulator Ambient Temperature -- Degrees Fahrenheit	65	85	105	125	145	165	185
Current Setting							
Chart # 8	30-35	29-34	28-32.5	27-31	25-30	24.5-28.5	23-27
Chart # 9		53.5-59.5	51-57	49-54.5	46.5-52.5		
Chart # 10	25-30	24.5-29	23.5-28	23-27	21.5-25.5	20.5-24.5	19.5-23.5
Chart # 11	20-24.2	19.3-23	18.5-22	17.5-20.8	16.5-19.7	15.5-18.5	14.4-17.3
Chart # 12	35-40	34-38.5	32.5-37	31-35.5	29.5-33.5		
Chart # 13	45.5-50.5	44-48.5	42.5-47	41-45.5	39.5-43.5		

TABLE 2 STANDARD TRACTOR TYPE REGULATOR SERVICE TEST SPECIFICATIONS

Regulators for which specifications are listed in this table must be checked and adjusted according to the procedures given in the applicable service bulletin. These regulators have an internal wiring circuit which is quite different from standard automotive regulators and require special testing methods.

All electrical checks and adjustments must be made with the regulator at operating temperature and on closed circuit.

Regulator Model	Service Bulletin	Circuit	Polarity	Spec. No.	CUTOUT RELAY †Air Gap (In.)	Point Opening (In.)	Closing Range	Voltage Adjust	VOLTAGE REGULATOR †Air Gap (In.)	Voltage Range	Setting Adjust
1118982	1R-111	A	P	1504	.020	.020	5.9-7.0	6.4	.075	6.6-7.2	6.9
1118983	1R-111	A	N	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118984	1R-111	A	N	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118985	1R-111	A	P	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118986	1R-111	A	P	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118987	1R-116	A	N	2138	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118988	1R-111	A	N	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118989	1R-116	A	N	3239	.020	.020	5.0-6.0	5.5	.075	6.5-7.2	6.8
1118990	1R-116	A	N	1510	.020	.020	11.8-13.6	12.8	.075	13.9-14.9	14.3
1118991	1R-116	A	N	2138	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118992	1R-116	A	P	2143	.020	.020	5.9-6.7	6.4	.075	6.8-7.4	7.0
1118993	1R-111	A	P	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118995	1R-116	A	N	3258	.020	.020	5.9-6.7	6.4	.075	7.0-7.7	7.4
1118997	1R-111	A	P	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1118998	1R-111	A	N	1544	.020	.020	23.5-27.0	25.5	.075	27.2-29.0	28.0
1118999	1R-111	A	N	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1119191	1R-116	A	P	2138	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1119298	1R-116	A	N	1510	.020	.020	11.8-13.6	12.8	.075	13.9-14.9	14.3
1119575	1R-111	A	P	1504	.020	.020	5.9-7.0	6.4	.075	6.6-7.2	6.9
1119576	1R-111	A	P	1505	.020	.020	11.8-14.0	12.8	.075	13.6-14.5	14.0
1119577	1R-111	A	N	1505	.020	.020	11.8-14	12.8	.075	13.6-14.5	14.0
1119578	1R-111	A	N	2151	.020	.020	5.9-7.0	6.4	.075	6.8-7.4	7.1

† Tolerance plus or minus 10%.

TABLE 3 STANDARD REGULATOR (DOUBLE CONTACT VOLTAGE REGULATOR) SERVICE TEST SPECIFICATIONS

Regulators listed in this table contain double-contact type voltage regulators which must be set in accordance with the temperature-voltage chart on page 10. The chart number is indicated in the specifications. The voltage regulator must be stabilized by operating it for 15 minutes before the setting is made.

Current regulators which are temperature compensated must be set in accordance with the proper temperature-current chart on page 10. The chart number is indicated in the specifications. The current regulator must also be stabilized by operating it for at least 15 minutes before the final setting is made.

Regulator Model	Service Bulletin	Circuit	Polarity	Spec. No.	CUTOUT RELAY †Air Gap (In.)	CUTOUT RELAY Point Opening (In.)	CUTOUT RELAY Closing Voltage Range or Chart	VOLTAGE REGULATOR Air Gap	VOLTAGE REGULATOR Point Opening (In.)	VOLTAGE REGULATOR Voltage Chart	CURRENT REGULATOR †Air Gap (In.)	CURRENT REGULATOR Current Setting (Amps.) or Chart
1119149	1R-119	A	P	2174	.020	.020	11.8-13.5	‡‡	.016	No. 2(s)	.075	43-47
1119157	1R-119	A	P	2175	.020	.020	11.8-13.5	‡‡	.016	No. 2(t)	.075	48-52
1119158	1R-119	A	P	2176	.020	.020	11.8-13.5	‡‡	.016	No. 2(s)	.075	33-37
1119163	1R-119	A	N	2182	.020	.020	11.8-13.5	‡‡	.016	No. 2(t)	.075	37-42
1119167	1R-119	A	N	2175	.020	.020	11.8-13.5	‡‡	.016	No. 2(t)	.075	48-52
1119175	1R-119	A	N	2188	.020	.020	11.8-13.5	‡‡	.016	No. 2(t)	.075	53-57
1119183	1R-119	A	N	2176	.020	.020	11.8-13.5	‡‡	.016	No. 2(s)	.075	33-37
1119186	1R-119	A	N	2174	.020	.020	11.8-13.5	‡‡	.016	No. 2(s)	.075	43-47
1119600	1R-119A	A	N	2194	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 7
1119601	1R-119A	A	N	2195	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 8
1119602	1R-119A	A	N	2198	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 9
1119603	1R-119A	A	N	2199	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	43-47
1119604	1R-119A	A	N	3200	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 10
1119605	1R-119A	A	N	3202	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	53-57
1119606	1R-119A	A	N	3204	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	48-52
1119607	1R-119A	A	P	3204	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	48-52
1119608	1R-119A	A	N	3207	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 11
1119609	1R-119A	A	P	2199	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	43-47
1119610	1R-119A	A	N	3208	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 12
1119611	1R-119A	A	N	3209	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	33-37
1119612	1R-119A	A	P	3209	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	33-37
1119613	1R-119A	A	P	3202	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	53-57
1119614	1R-119A	A	N	3213	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	9-11
1119615	1R-119A	A	N	3224	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	58-62
1119617	1R-119A	A	N	2195	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 8
1119619	1R-119A	A	N	3240	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 13
1119621	1R-119A	A	P	3243	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	27-33
1119623	1R-119A	A	N	2194	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 7
1119624	1R-119A	A	P	3208	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 12
1119625	1R-119A	A	N	3246	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	22-26
1119626	1R-119A	A	N (i)	3247	.017	.032	22.8-25.2	‡	.016	No. 3(p)	.075	14-16
1119627	1R-119A	A	N	3248	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	38-42
1119628	1R-119A	A	P	3224	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	58-62
1119629	1R-119A	A	N	3249	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 14

‡ Adjust air gap as outlined in applicable service bulletin ONLY when necessary to obtain specified difference between voltage settings of upper and lower contacts. After bench repair only, set air gap to approximately .067"; then make final air gap adjustment per applicable service bulletin.

‡‡ Adjust air gap as outlined in applicable service bulletin ONLY when necessary to obtain specified difference between voltage settings of upper and lower contacts. After bench repair only, set air gap to approximately .080"; then make final air gap adjustment per applicable service bulletin.

† Tolerance plus or minus 10%.

(i) Insulated.

(n) Operation on lower contacts must be .1-.3 volt lower than on upper contacts.

(p) Operation on lower contacts must be .2-.6 volt lower than on upper contacts.

(s) Operation on upper contacts must be .2-.35 volt lower than on lower contacts.

(t) Operation on upper contacts must be .3-.5 volt lower than on lower contacts.

TABLE 3 (CONTINUED) STANDARD REGULATOR (DOUBLE CONTACT VOLTAGE REGULATOR) SERVICE TEST SPECIFICATIONS

Regulator Model	Service Bulletin	Circuit	Polarity	Spec. No.	CUTOUT RELAY †Air Gap (In.)	CUTOUT RELAY Point Opening (In.)	CUTOUT RELAY Closing Voltage Range or Chart	VOLTAGE REGULATOR Air Gap	VOLTAGE REGULATOR Point Opening (In.)	VOLTAGE REGULATOR Voltage Chart	CURRENT REGULATOR †Air Gap (In.)	CURRENT REGULATOR Current Setting (Amps.) or Chart
1119630	1R-119A	A	N	3208	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 12
1119631	1R-119A	A	P	3255	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	48-52
1119632	1R-119A	A	P	3240	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 13
1119633	1R-119A	A	N	3249	.020	.020	No. 1	‡	.016	No. 2(n)	.075	No. 14
1119634	1R-119A	A	P	3257	.020	.020	11.5-12.7	‡	.016	No. 5(n)	.075	23-27
1119635	1R-119A	A	N	3259	.023	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 15
1119636	1R-119A	A	N	3261	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	53-57
1119637	1R-119A	A	N	3255	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	48-52
1119638	1R-119A	A	N	3263	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	38-42
1119639	1R-119A	A	N	3264	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	No. 12
1119640	1R-119A	A	P	3263	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	38-42
1119641	1R-119A	A	N	3265	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	No. 10
1119642	1R-119A	A	N	3266	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	33-37
1119643	1R-119A	A	N	3267	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	No. 16
1119644	1R-119A	A	P	3267	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	No. 16
1119645	1R-119A	A	P	3268	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	23-27
1119646	1R-119A	A	P	3269	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	19-21
1119647	1R-119A	A	N	3269	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	19-21
1119648	1R-119A	A	P	3207	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 11
1119649	1R-119A	A	N	3200	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 10
1119650	1R-119A	A	P	3202	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	53-57
1119651	1R-119A	A	N	3202	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	53-57
1119652	1R-119A	A	N	3273	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	No. 13
1119653	1R-119A	A	N (i)	3274	.017	.032	22.8-25.2	‡	.016	No. 3(p)	.075	19-21
1119654	1R-119A	A	N	3275	.023	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 12
1119655	1R-119A	A	P	3248	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	38-42
1119656(b)	1R-119A	A	N	3278	.017	.032	22.8-25.2	‡	.016	No. 3(p)	.075	48-52
1119657	1R-119A	A	P	3280	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	23-27
1119658	1R-119A	A	N	3204	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	48-52
1119659	1R-119A	A	N	2195	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 8
1119660	1R-119A	A	P	3255	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	48-52
1119661	1R-119A	A	N	3255	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	48-52
1119662	1R-119A	A	P (i)	3289	.017	.032	22.8-25.2	‡	.016	No. 3(w)*	.075	19-21
1119663	1R-119A	A	N	3243	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	27-33
1119664	1R-119A	A	N (i)	3294	.020	.020	11.8-13	‡	.016	No. 2(n)*	.075	9-11
1119665	1R-119A	A	P	3247	.017	.032	22.8-25.2	‡	.016	No. 3(p)	.075	14-16
1119666	1R-119A	A	P	3299	.017	.032	22.8-25.2	‡	.016	No. 3(w)*	.075	14-16
1119667	1R-119A	A	N	3243	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	27-33
1119668	1R-119A	A	N	3200	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 10
1119669	1R-119A	A	P	3261	.020	.020	11.8-13	‡	.016	No. 4(n)*	.075	53-57
1119670	1R-119A	A	P	4203	.017	.032	22.8-25.2	‡	.016	No. 3(p)	.075	17-19
1119671	1R-119A	A	N	3208	.020	.020	11.8-13	‡	.016	No. 2(n)	.075	No. 12
1119672	1R-119A	A	P	4217	.020	.020	11.8-13	‡	.016	No. 6(n)	.075	48-52
1119673	1R-119A	A	P	4218	.020	.020	11.8-13	‡	.016	No. 6(n)	.075	27-33
1119674	1R-119A	A	P	4219	.020	.020	11.8-13	‡	.016	No. 6(n)	.075	33-37
1119676	1R-119A	A	N	4225	.020	.020	11.8-13	‡	.016	No. 4(n)	.075	19-21

‡ Adjust air gap as outlined in applicable service bulletin ONLY when necessary to obtain specified difference between voltage settings of upper and lower contacts. After bench repair only, set air gap to approximately .067"; then make final air gap adjustments per applicable service bulletin.

† Tolerance plus or minus 10%.

* This measurement to be made with the external adjustment screw at "0".

(b) Paralleling: with no load on BAT. terminal, add 2.5 amp. load at P-terminal--voltage regulator to operate 2-3 volts lower.

(i) Insulated.

(n) Operation on lower contacts must be .1-.3 volt lower than on upper contacts.

(p) Operation on lower contacts must be .2-.6 volt lower than on upper contacts.

(w) Operation on lower contacts must be .4-.7 volt lower than on upper contacts.