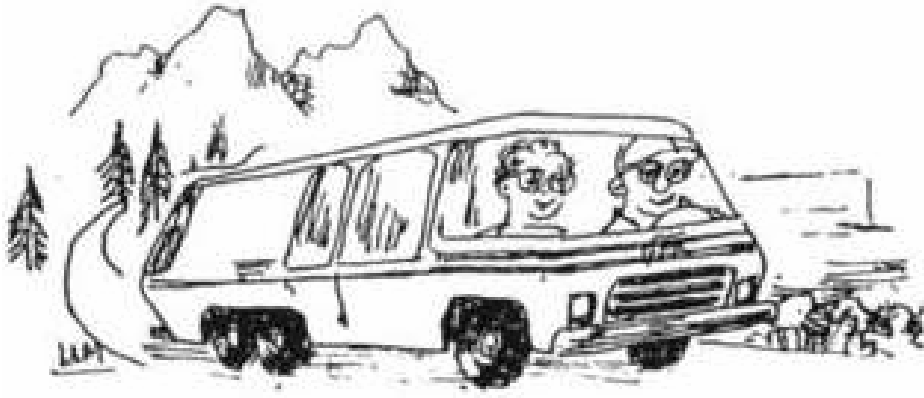


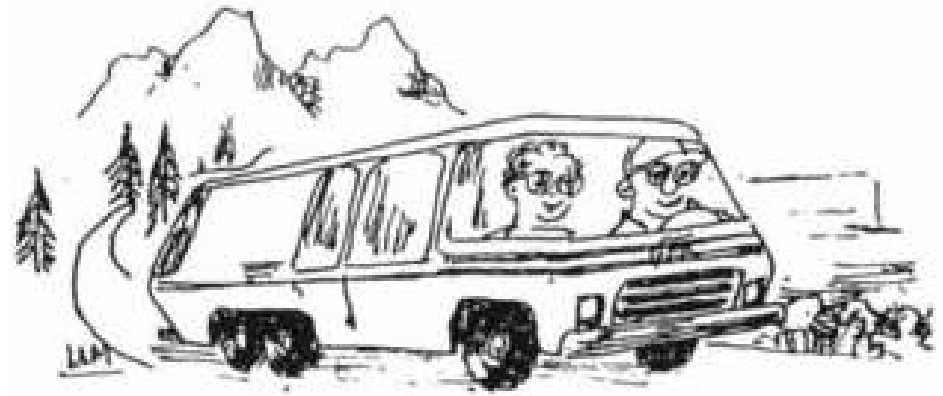
**GMC MOTORHOME
INTERNATIONAL CLUB**



**GMC ONAN POWER DRAWER
ELECTRICAL TROUBLE SHOOTING
DEMO**

**WHEN ALL ELSE FAILS
READ THE MAINTENANCE MANUAL**

**GMC MOTORHOME
INTERNATIONAL CLUB**



**GMC ONAN POWER DRAWER
ELECTRICAL TROUBLE SHOOTING
DEMO**

**PREPARED BY: DUANE M SIMMONS
MARCH 21, 2004
SPRING CONVENTION....LAS VEGAS, NV**

MANY THANKS TO LEN MORTIMER FOR THE COVER ART
WORK & ALL THOSE GMC PACIFIC CRUISERS THAT
REVIEWED THIS DOCUMENT PRIOR TO PUBLICATION.

THE CONTENTS OF THIS DOCUMENT ARE BASED UPON
PERSONAL EXPERIENCE GAINED BY “HANDS-ON”
VEHICLE MAINTENANCE OVER MANY YEARS. THEY ARE
“ONE MAN’S” VIEWPOINT & DO NOT REPRESENT
AUTHORIZED DATA PERTAINING TO THE GMC
MOTORHOME. IT IS THE READER’S RESPONSIBILITY TO
ESTABLISH HIS/HER POSITION ASSOCIATED WITH EACH
SUBJECT MATTER BEFORE VEHICLE REPAIR &/or
MODIFICATIONS ARE ACCOMPLISHED.

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ONAN CONTROL BOARD OPERATION

DATA FORM: TROUBLE SHOOTING AID

	<u>Measured Value</u>
1) Remove Board Cover & Spray/Soak Wire Terminals with 2-26	
2) Measure DC Voltage between <u>Terminals 5 & 1</u>	(s/b ~ 12.8 v dc) _____ v dc
3) Measure DC Voltage between <u>Terminals 8 & 1</u>	(s/b ~ 12.8 v dc) _____ v dc
4) W/Starter engaged, measure dc voltage <u>Term. 10 & 1</u>	(s/b 10.5 v dc min.) _____ v dc
5) Jumper <u>Terminals 9 to 5</u> , Hear Fuel Pump & Start Onan NOTE: If No Start: Ignition, Fuel supply or wiring problem	FUEL PUMP RUN YES _____ NO _____ START YES _____ NO _____
6a) W/Onan Running, Measure AC Voltage between <u>Term. 8 & 11</u>	(s/b 26 to 31 v AC) _____ v ac
6b) Measure DC Voltage between <u>Term. 12 & 11</u>	(s/b near zero) _____ v dc
6c) Measure DC Voltage between <u>Upper Term. 1 & 2</u>	(s/b ~ 12 v dc) _____ v dc
6d) Remove the jumper.....does the Onan continue to run ???	RUN Yes _____ No _____
7a) Stop Onan & measure DC Voltage between <u>Term. 12 & 11</u>	(s/b ~ 12.8 v dc) _____ v dc
7b) Pull wire from <u>Term. 12</u>Try to Start	START YES _____ NO _____*
8a) Stop Onan & measure DC Voltage between <u>Upper Term. 1 & 2</u>	(s/b ~ zero v dc) _____ v dc
8b) Pull wire from <u>UPPER Term. 1, 2 & 3</u>Try to Start	START YES _____ NO _____*

NOTE: 1) *If STEPS 1 THRU 6 (except 6d) is OK & Step 7 & 8 is No Start: Suspect Control Board !!!
2) "S/B~" Means "Should Be Approximate value"

TROUBLE SHOOTING AID: NO STARTER ACTION

**PRESS CONTROL BOARD START SW & NO STARTER ACTION
JUMPER K-1 STARTER RELAY “S” TERMINAL (SMALL) TO CHASSIS GROUND**

STARTER ACTION

- CONTROL BOARD OR WIRING FAULTY

NO STARTER ACTION

- APPLY +12V DC TO K-1 STARTER RELAY “S1” TERMINAL (LARGE, LEFT SIDE)
STARTER ACTION

K-1 RELAY FAULTY

NO STARTER ACTION

APPLY +12V DC TO STARTER SOLENOID “S” TERMINAL (SLIP-ON TERM.)

STARTER ACTION

WIRING BETWEEN K-1 & STARTER SOLENOID FAULTY

- NO STARTER ACTION

- STARTER FAULTY

NOTE:

IF STARTER EVER STAYS ENGAGED AFTER ONAN STARTS

- PULL SLIP-ON TERMINAL WIRE FROM STARTER SOLENOID TO STOP STARTER

IF STARTER WILL NOT STOP: SUSPECT STARTER SOLENOID (CLEAN & LUBE)

NOTE: REMOVE BATTERY CABLE TO STOP

- IF STARTER STOPS: SUSPECT K-1 RELAY & ASSOCIATED DRIVE CIRCUIT

ONAN CONTROL BOARD OPERATION

GENERAL INFORMATION

AIR FILTER:

- K&N WASHABLE FILTER #R-1030 FOR 6 KW ONLY
- CUT OFF UPPER RUBBER ELBOW FOR FLAT SURFACE & MOUNT W/ORIGINAL BOLT

OIL FILTER:

- MANY AFTERMARKET FILTERS AVAILABLE...SELECT ONE W/BUILT IN BYPASS

STARTER MOTOR:

- ORIGINAL STARTER (191-1052) IS DISCONTINUED W/O REPLACEMENT
- ASK FOR 191-1949-03 STARTER...MAY REQUIRE SLIGHT MOD TO CLEAR BRACKET

ONAN CARBURATOR IS DISCONTINUED W/O REPLACEMENT

REBUILD SERVICE AVAILABLE AT:

LUIS SALES, WALBRO CORP. CARBURATOR DIV.

6242 GARFIELD ST

CASS CITY, MI 48726

517-872-2131

**REPLACEMENT CARB. REBUILD GASKET: BRIGGS & STRATTON P/N 281165S
MAIN/RUN JET SEAL: 1/8” ID x 1/4” OD O’RING**

SET FLOAT LEVEL AT 1/16” (NOT 3/32” AS NOTED IN SOME GMC MANUALS)

STARTER MOUNTING BRACKET

REPLACE BROKEN BRACKET W/HIGH STRENGTH STEEL BRACKET FROM

RAGUSA PATTERNS, SANTA ANA, CA 949-261-5898 P/N RV-04

ONAN CONTROL BOARD OPERATION

PRE-TROUBLE SHOOTING ACTIVITY

VERIFY HOUSE/ONAN BATTERY IS FULLY CHARGED, BATTERY CABLES CLEANED AT BOTH ENDS WITH ANTI-CORROSION APPLIED (NCP-2) ANTI-CORROSION COMPOUND TO BATTERY TERMINALS/ CONNECTORS & ANTI-OXIDANT (NOALOX) ANTI-JOINT COMPOUND APPLIED TO OTHER CABLE ENDS.

VERIFY THAT THE CONTROL BOARD CONTAINS 5 AMP FUSE (ONLY).

VIRIFY THAT THE OIL LEVEL IS ABOVE THE "ADD OIL LINE"

OBSERVE THE STARTER RELAY K-1* (LARGE RELAY LOCATED JUST BELOW THE CONTROL BOARD) AS FOLLOWS:

THE SMALL RIGHT TERMINAL "I" SHOULD NOT HAVE ANY WIRES ATTACHED.

IF IT DOES, REMOVE ALL WIRES & ATTACHED TO THE LARGE LEFT TERMINAL.

OBSERVE THE AIR FILTER AS BEING CLEAN.....REPLACE WITH K&N's R-1030 FILTER

PUSH & PULL ON THE STARTER TO VERIFY THAT THE STARTER IS ATTACHED FIRMLY W/O A BROKEN BRACKET OR LOOSE BOLTS.

NOTE:

(*) K-1 Relay is not a common Automotive Starter relay since it has an internal connection of one lead of the coil to the large right terminal. Requires a Good Ground connection to the "S" for Relay action.

ONAN CONTROL BOARD OPERATION

TROUBLE SHOOTING AID: RC PANEL IS NON FUNCTIONAL

IF ANY OF THE RC PANEL FUNCTIONS ARE NON RESPONSIVE

SUSPECT THE 4 WIRE CONNECTOR FAULTY (LOCATED IN ONAN COMPARTMENT NEAR REAR ON COMPARTMENT FLOOR)

ELIMINATE THE 4 WIRE CONNECTOR BY HARD WIRE BYPASS

PRESS RC PANEL START SW & STOP SW: ONAN SHOULD RESPOND

IF NON FUNCTIONAL

REMOVE WIRES FROM UPPER BOARD TERMINALS 1, 2 & 3

JUMPER UPPER TERMINAL 1 TO 3: ONAN SHOULD START
IF FUNCTIONAL

SUSPECT RC PANEL/WIRING FAULTY

IF NON FUNCTIONAL

SUSPECT CONTROL BOARD FAULTY

JUMPER UPPER TERMINALS 1 TO 2 (ONAN RUNNING): ONAN SHOULD STOP
IF FUNCTIONAL

SUSPECT RC PANEL/WIRING FAULTY

IF NON FUNCTIONAL

SUSPECT CONTROL BOARD FAULTY

TROUBLE SHOOTING AID: WILL NOT RESPOND TO STOP SWITCH

PRESS CONTROL BOARD'S STOP SW: NON FUNCTIONAL/WILL NOT STOP
REMOVE WIRES FROM BOARD'S UPPER TERMINALS 1, 2 & 3
ATTACH JUMPER BETWEEN UPPER TERMINALS 1 & 2
NON FUNCTIONAL/WILL NOT STOP
SUSPECT FAULTY CONTROL BOARD

FUNCTIONAL
SUSPECT FAULTY REMOTE CONTROL PANEL OR ASSOCIATED WIRING

TO FORCE STOP FUNCTION
REMOVE WIRE FROM BOARD TERMINAL 11, 9 OR 1

NOTE: RECONNECT WIRES & PROBE BOARD TERMINAL 9 TO 1 THERE SHOULD BE LESS THAN 1 VOLT DC PRESENT WITH ONAN NOT RUNNING. IF VOLTAGE IS PRESENT, REMOVE WIRE FROM BOARD TERMINAL 9 & PROBE TERMINAL 9 & THEN WIRE ONLY FROM TERMINAL 9 TO SEE IF VOLTAGE IS PRESENT FROM THE BOARD OR THE ONAN WIRING.

ONAN CONTROL BOARD OPERATION

BOARD TO 12 PIN CONNECTOR (J-2) CABLE WIRE DEFINITION

J-2 PIN #	TO BOARD TERMINAL #	FUNCTION
1	1 (UPPER)	GROUND <u>TO</u> REMOTE CONTROL
2	2 (UPPER)	STOP <u>FROM</u> REMOTE CONTROL
3	3 (UPPER)	START <u>FROM</u> REMOTE CONTROL
4	1 (LOWER)	MAIN BOARD GROUND (-) <u>INPUT</u>
5	5 (UPPER) or 6 (UPPER)	FUSED +12 V <u>TO</u> REMOTE CONTROL
6	5 (LOWER)	FUSED +12 V <u>TO</u> VOLTAGE REG.
7	7 (LOWER)	GROUND <u>TO</u> K1-S (START CMD)
8	8 (LOWER)	FW ALT. AC VOLTAGE <u>TO</u> BOARD
9	9 (LOWER)	+12 V OUTPUT <u>TO</u> IGN, PUMP, ETC
10	10 (LOWER)	+12 V <u>FROM</u> K-1 W/STARTER ON
11	11 (LOWER)	+12 V <u>INPUT</u> POWER FROM K-1
12	12 (LOWER)	LOP SIG <u>INPUT</u> TO BOARD (P SW)

GENERAL REPAIR COMMENTS

KEEP WATER OFF OF ONAN

IF IT GETS WET, DRY IT OUT BEFORE STARTING [24 HRS MIN.] KEEP WATER OFF OF ONAN

CLEAN CONNECTORS & BOARD TERMINALS W/ ELECTRICAL CLEANER

CRC INC. #2-26 ELECTRICAL GRADE CONTACT CLEANER OR EQUAL @ HOME DEPOT HOME CENTER [ELECTRICAL DEPT.]

REPAIR J1 & J2 W/CLEANER & CAREFULLY CLOSE FEMALE SOCKETS [BACK TO ORIGINAL SHAPE] FOR BETTER CONTACT [HARDWIRE IF NECESSARY]

VERIFY LOW OIL PRESSURE [LOP] CIRCUIT AS NOTED HEREIN [COULD SAVE AN ENGINE WHICH IS LOW IN OIL PRESSURE]

BEFORE YOU DECLARE THE CONTROL BOARD FAULTY VERIFY:

FUSE F-1 [5 AMPS] IS FUNCTIONAL

J1 & J2 CONNECTOR IS FUNCTIONAL [CLEAN & REPAIR]

WIRE TERMINALS /BOARD TERMINALS ARE FUNCTIONAL

NO BROKEN OR SHORTED WIRES

LOP FUNCTIONAL [NOT SHORTED TO GROUND]

VOLTAGE REGULATOR [VR 1] IS DISABLED: TERM. 8 TO 11 @ 28 +/- 2 V AC

BOARD REPAIR & TECHNICAL ASSISTANCE: DUANE SIMMONS

714-633-4731

SIMMEE@JUNO.COM

4320 FERNWOOD AVE.

ORANGE, CA 92869

ONAN CONTROL BOARD OPERATION

TROUBLE SHOOTING AID: NO AC POWER OUTPUT

HIGH SUSPECT IS FAILED BRIDGE RECTIFIER (BR):

REPLACE/ADAPT W/HIGHER VOLTAGE RATED BR (NTE 5328 OR EQUIVALENT)

NOT PIN COMPATIBLE & REQUIRES BASE MODIFICATION TO ALLOW INDIVIDUAL WIRE ATTACHMENT

SEE GMC MAINTENANCE MANUAL FOR BR TEST METHOD

ONAN CIRCUIT BREAKER FAILURE:

REPLACE/ADAPT BUTTON TYPE W/MORE RELIABLE UNIT (GE/WESTINGHOUSE

“QUICK LAG” TYPE @ 40 OR 50 AMP.)

- PROBE EACH CB WIRE TERMINAL W/RESPECT TO CHASSIS GROUND TO DETERMINE IF AC IS PRESENT

LOSS OF RESIDUAL MAGNETISM:

DISASSEMBLY OR ELECTRICAL FAULT MAY CAUSE LOSS/REVERSAL OF RESIDUAL MAGNETISM

POLARIZE MAGNET BY A FLASH/MOMENTARY CURRENT FLOW INTO FIELD WINDING:

- REMOVE BR & APPLY FLASH/MOMENTARY BATTERY + VOLTAGE TO THE FIELD + WIRE & CHASSIS (-) VOLTAGE TO FIELD NEGATIVE (-) WIRE

(MOMENTARY ONLY)

BRUSH FAILURE: SEE GMC MAINTENANCE MANUAL FOR DETAILS

NOTE: THE CONTROL BOARD IS FOR ENGINE OPERATION ONLY & HAS NOTHING TO DO WITH AC POWER GENERATION