

Jake Brake®

Troubleshooting:

DDEC II Controls

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Introduction

These instructions are applicable for Jake Brake® Models 71/92A, 750, 760, 760A and 765.

The Jacobs Electronic Control Module, P/N 017179, is a sealed electronic device and is not field serviceable. The Control Module can be operated using the standard dash toggle switches or the Jacobs Dash Switch Module, P/N 017328 or 017346. To test if this device requires replacement, follow the step-by-step procedures within the troubleshooting guide.

Equipment Required for Testing: Voltmeter with 20,000 Ohm/volt input impedance, minimum. Keep the voltmeter on the 20 VDC/div scale for the 12-volt control and 200 VDC/div scale for the 24-volt control for all test measurements.

NOTE:
THIS CONTROL CAN BE USED FOR 12- OR 24-VOLT OPERATIONS. USE +12/24 VOLTS WHEN REFERRING TO THE (+) BATTERY VOLTAGE. THIS GUIDE WILL MAKE REFERENCE TO A 12-VOLT OPERATION. ACTUAL BATTERY VOLTAGE MAY VARY UP TO 2 VOLTS.

If measuring the voltage at the solenoid valves, make sure that all wiring harnesses are connected. If the voltage at the output of the control is measured without the solenoid valves connected, both the BLUE and YELLOW wires will measure approximately +1 volt. These are internal voltages established by the control module when the output wires are disconnected.

Operation Function

The in-line switch module (if used) is connected to the power input side of the control. This is the harness with the RED and GREEN wires, P/N 015708.

The ON/OFF power switch connects the RED wire to the +12 volt vehicle electrical system providing power to the control module.

The PURPLE and GRAY inputs select which one of the DK BLUE or YELLOW outputs will be active. The (AUX LO) GRN/YEL, (AUX HI) ORANGE, (#508) BROWN, and (CLUTCH SWITCH) BLACK and WHITE inputs control when the DK BLUE and YELLOW will be active. To allow the outputs to be active, the following must be true:

1. The clutch switch must be closed connecting the BLACK and WHITE wires together.
2. The (AUX LO) GRN/YEL wire must be connected to ground (0 VDC).
3. The (AUX HI) ORANGE wire must be connected to the WABCO ABS Interface. If the vehicle is not equipped with ABS, the end of the wire should be insulated.

Before active troubleshooting is begun, check the integrity of all wiring and harness connections to verify that connections are tight and that wires are not pinched and do not have damaged insulation.



JAKE BRAKE® MODELS 71/92A WIRING DIAGRAM DDEC SERIES II (2 MODE)

CONTROL GROUP P/N 017363

For Model 750 DDEC II (2-mode), use the wiring diagram for Model 71/92A and change the Harness, P/N 01737B, to P/N 017370. Add the Harness, P/N 017393; Connector, P/N 01482B; and Undercover Wiring, P/N 01909B. Change the housing identification from "LEFT" and "RIGHT" to "REAR" and "FRONT".

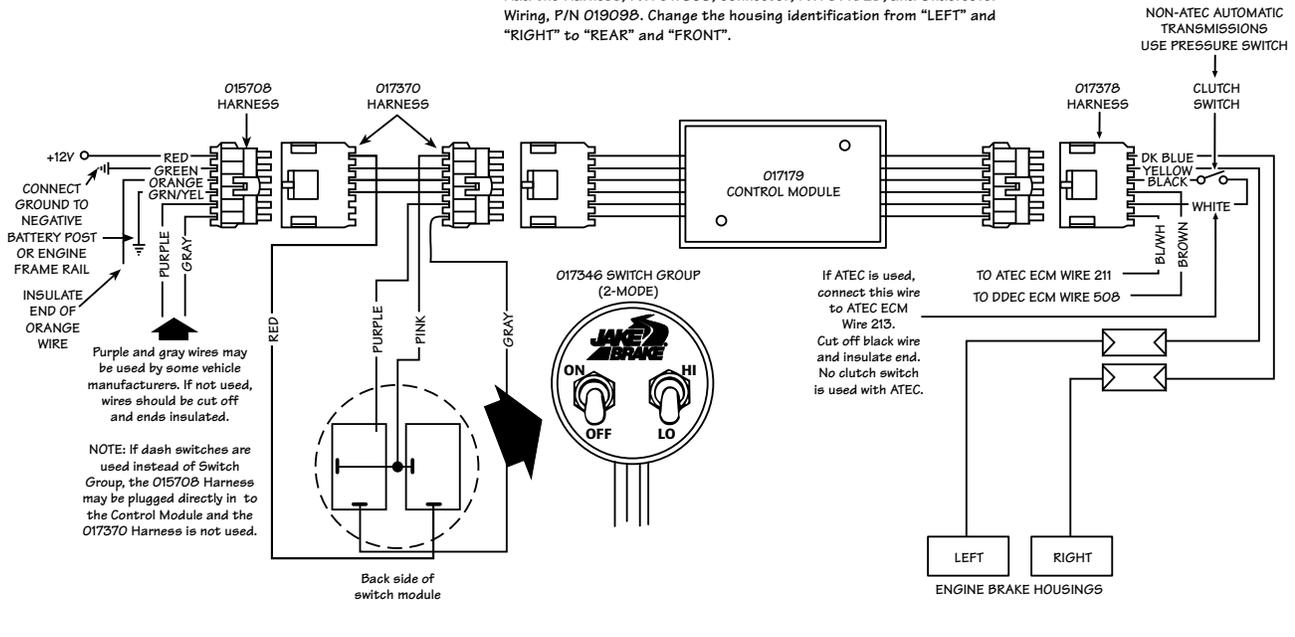


FIG. 1

MODELS 760, 760A AND 765 WIRING DIAGRAM DDEC SERIES II (3 MODE)

RETROFIT/AFTERMARKET INSTALLATION

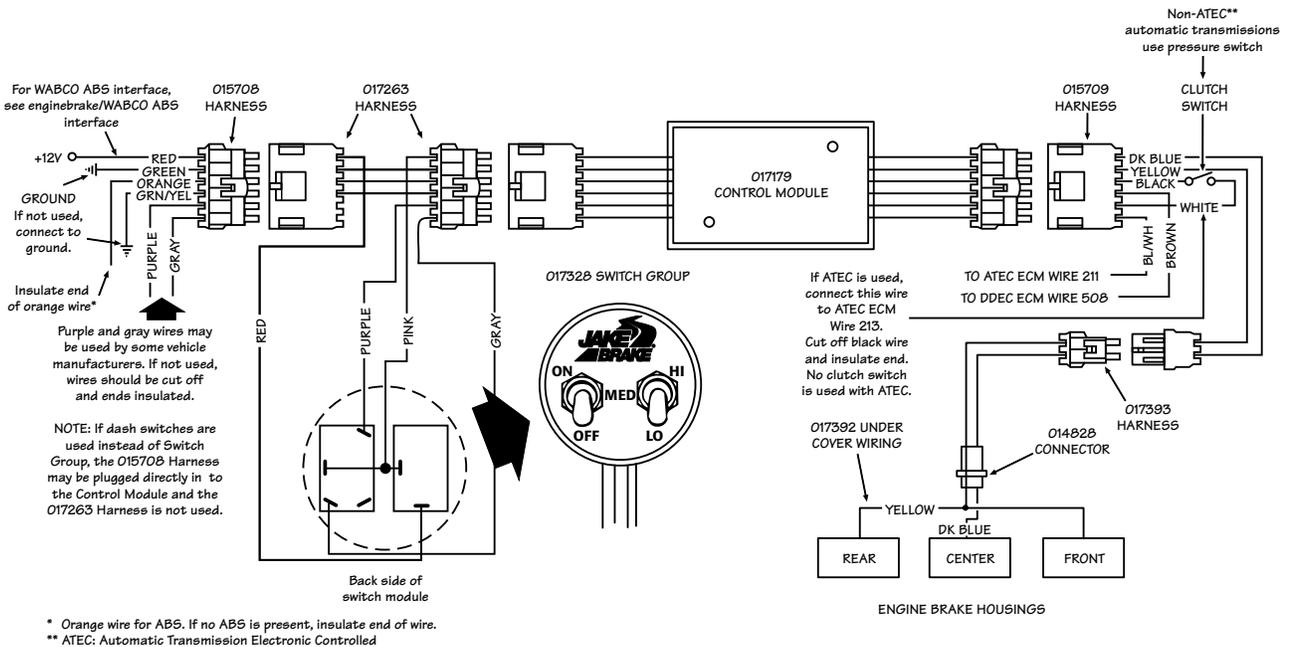


FIG. 2

Problem: Engine Brake will not activate

1. Probable Cause: Check supply voltage

Correction: With the ignition switch on, disconnect the P/N 015708 harness from the control module connector. Measure the voltage at the RED wire. Place the positive probe (+) of the voltmeter on the terminal of the RED wire and the negative probe (-) to ground. The voltmeter should read +12 VDC (Fig. 3). If this condition is not present, check that system is energized and check power supply.

Problem: Engine Brake will not activate (cont.)

2. Probable Cause: Check switches and connections

- a. Corrections:

Optional Selector Switch: Disconnect P/N 015708 harness from control module. Measure voltage at both PURPLE and GRAY wires. With selector switch in HI position, both wires should read +12 VDC (Fig. 4). If this condition is not present, check power supply, connections and switches. Repair or replace as required.

- b. Jacobs Switch Group: Disconnect P/N 017263 (017370) harness from Jacobs control module. Measure the voltage at the RED wire. The voltmeter should read +12 VDC when the main power supply is ON and 0 VDC with main power supply OFF (Fig. 5). If these conditions are not present, check power supply and connections.

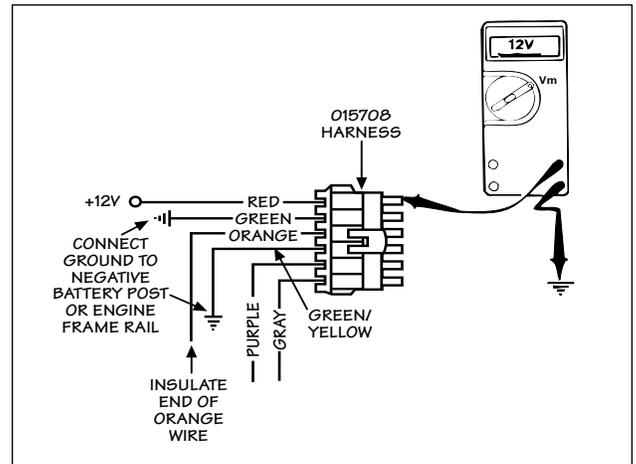


FIG. 3

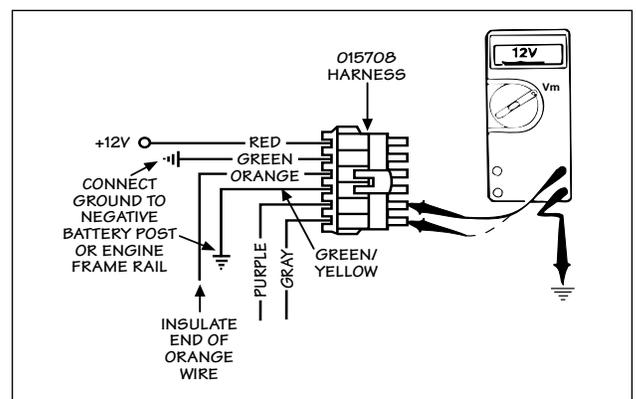


FIG. 4

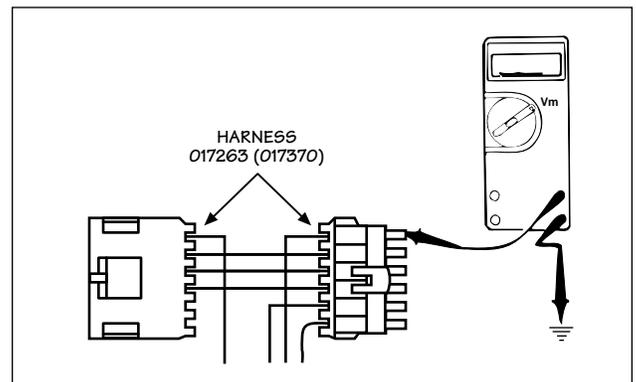


FIG. 5

Problem: Engine Brake will not activate (cont.)

2. Probable Cause: Check switches and connections

b. (continued)

(Fig. 6) With main power supply ON and selector switch in LO, the PURPLE wire should read +12 VDC and GRAY wire 0 VDC. With selector switch in MED position, GRAY wire should measure +12 VDC; PURPLE wire 0 VDC. With selector in HI position, both PURPLE and GRAY wires should measure +12 VDC. If these conditions are not present, check connections, check wiring schematic for proper position of wires to switch and/or replace switch.

3. Probable Cause: Check clutch switch.

Correction: With the P/N 015709 (017378) harness connected to the control module, measure the voltage at the terminal of the WHITE wire. With the clutch engaged (pedal not depressed), a reading of 0 VDC should be measured. With the clutch disengaged (pedal depressed) a reading of +5 VDC +/- 0.5 VDC should be measured (Fig. 7). If this condition does not exist, check continuity of clutch switch and BLACK and WHITE wires.

4. Probable Cause: Check engine brake enable signal.

Correction: Disconnect 015709 (017378) harness from 017179 module. Start the engine. Turn the engine brake switch OFF. Place the positive probe of the voltmeter at the terminal of the BROWN wire and the negative probe on ground (Fig. 8). Increase engine RPM to rated engine speed. The voltmeter should measure +12 VDC. Release throttle; voltage should drop to 0 VDC. When the engine reaches idle, the voltage should again read +12 VDC. If the voltage does not change, check connections and wiring. If problem continues, have the engine ECM checked.

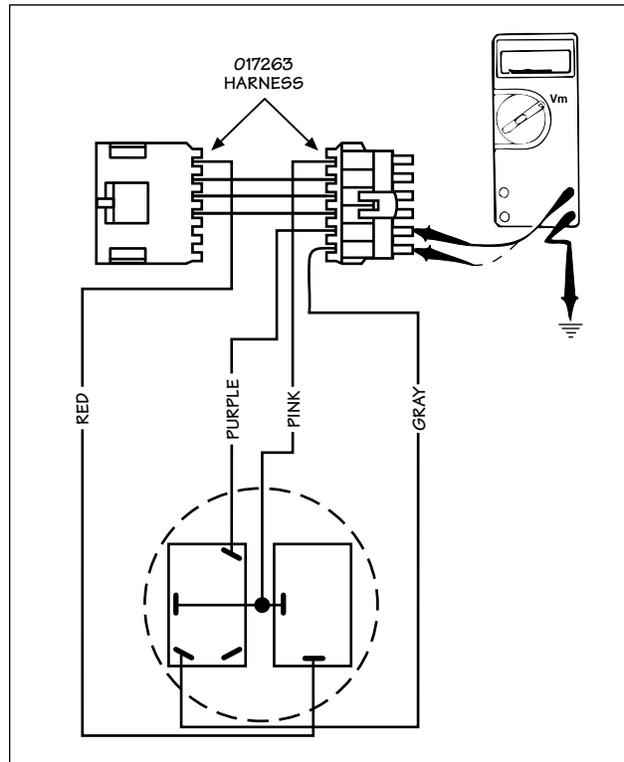


FIG. 6

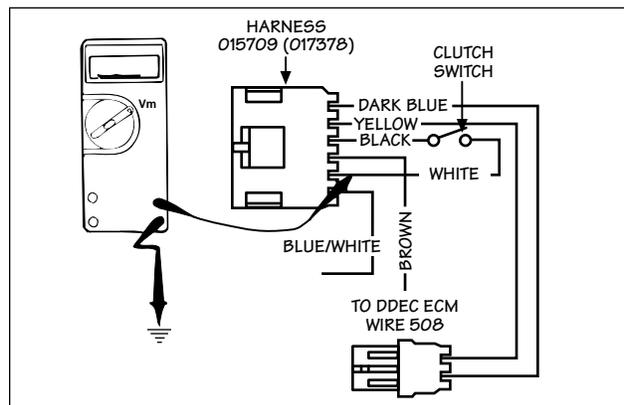


FIG. 7

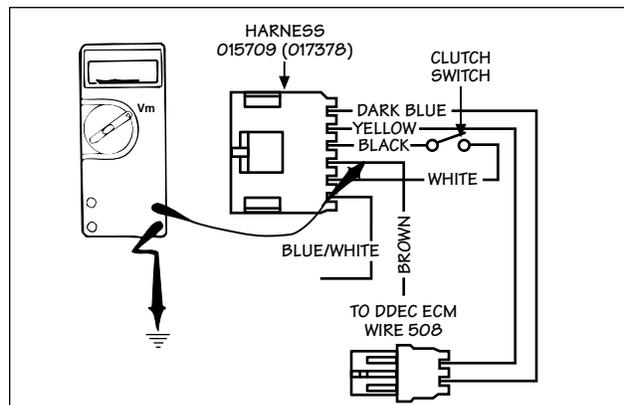


FIG. 8

Problem: Engine Brake will not activate (cont.)

5. Probable Cause: Check output.

Correction: Inspect DK BLUE and YELLOW wires leading to solenoid valve connectors. Check for loose contacts, pinched wires or scraped insulation. Start the engine, turn the engine brake switch ON and select HI. Advance the throttle to rated speed and then release the throttle. Voltage at both YELLOW and DK BLUE wires should measure +12 VDC (Fig. 9).

NOTE:

WHEN MEASURING VOLTAGE, CHECK THAT ALL HARNESS CONNECTIONS ARE TIGHT. IF THE VOLTAGE IS MEASURED WITH THE HARNESS FROM THE SOLENOID LOOSE OR DISCONNECTED, BOTH THE DK BLUE AND YELLOW WIRES WILL MEASURE APPROXIMATELY +1 VDC. THIS IS AN INTERNAL VOLTAGE ESTABLISHED BY THE CONTROL MODULE FOR REFERENCE.

6. Probable Cause: Check Jacobs control module.

Correction: Measure the voltage at the ORANGE wire of the control module. With system power ON, the voltage should measure +5 VDC +/- 0.5 VDC (Fig. 10). If this condition is not present, replace module.

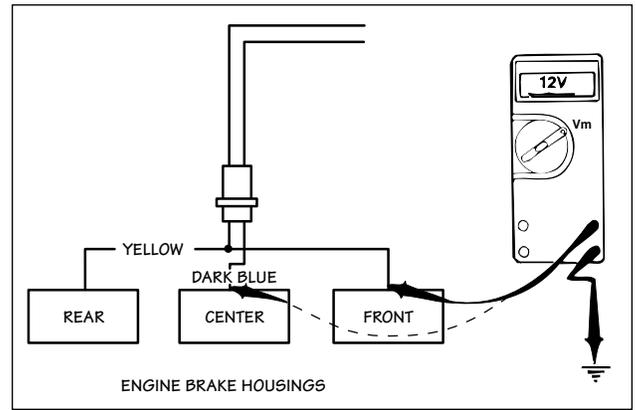


FIG. 9

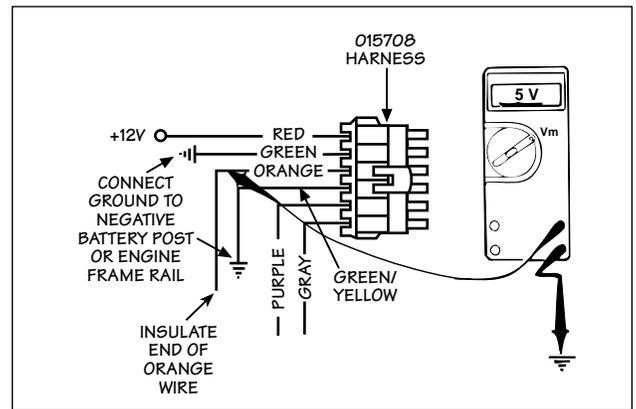


FIG. 10

Problem: Engine Brake performance erratic

1. Probable Cause: Check ground connection.

Correction: The resistance between the engine block and the negative terminal of the battery must be less than 1 ohm (Fig. 11). The resistance between the GREEN wire of the engine brake control module and the negative terminal of the battery must be less than 5 ohms for proper module operation (Fig. 12).

If vehicle is NOT equipped with ABS system:
The GREEN/YELLOW wire must be grounded, preferably to the same point as the GREEN wire. These wires should be isolated from other system ground wires. The ORANGE wire must not be grounded and must be insulated when not in use (no ABS).

Vehicles equipped with ABS system:
Refer to specific ABS or vehicle manufacturer's electrical wiring diagrams or consult a Jacobs distributor for more information

2. Probable Cause: Check undercover wiring.

Correction: Make sure solenoid wires are securely attached to the solenoid valves.

3. Probable Cause: Check for solenoid failure.

Correction: Measure resistance of each solenoid valve (Fig. 13). Solenoid valves not within correct values must be replaced (see chart below).

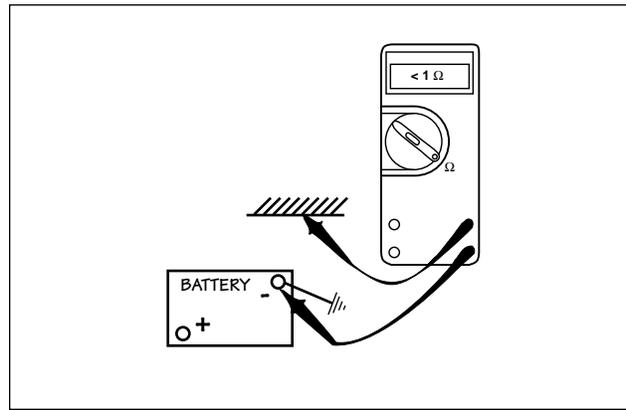


FIG. 11

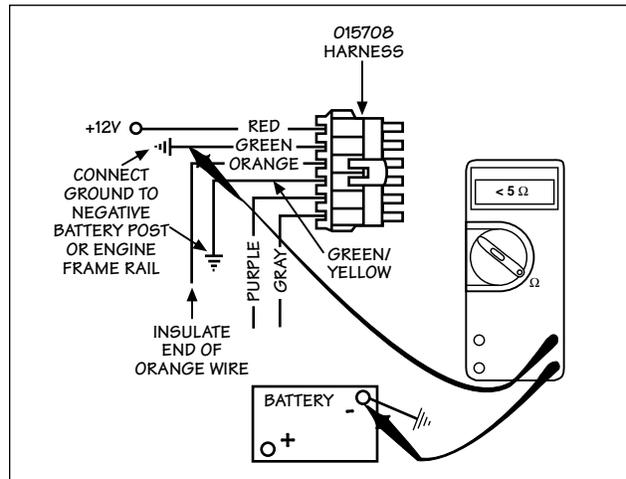


FIG. 12

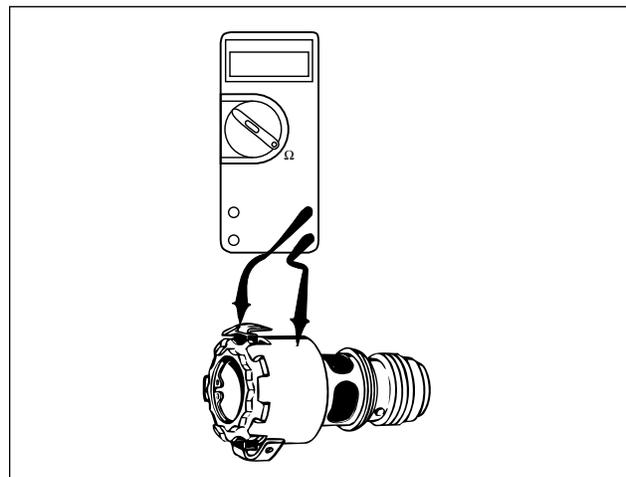


FIG. 13

P/N	VOLTAGE	RESISTANCE (OHMS)	
		COLD	HOT
016440*	12 VDC	9.62 to 10.75	11.8 to 14.3
016441*	24 VDC	31.5 to 38.5	38.2 to 50.0
016442*	24 VDC D/L	31.5 to 38.5	38.2 to 50.0
020239*	12 VDC	9.0 to 10.0	11.5 to 14.0
018674	12 VDC	9.5 to 10.5	11.5 to 14.0
013472*	24 VDC SCREW	34.9 to 38.7	43.3 to 51.3
003784, 004205, 003433, 002689	12 VDC	19.8 to 22.0	24.0 to 29.5
003784, 004205, 003433, 002689	24 VDC	19.8 to 22.0	24.0 to 29.5

* Current Production Solenoid Valves
D/L Dual Lead

NOTES

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22 East Dudley Town Road • Bloomfield CT 06002

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Printed in USA 12/95 P/N 021772