

Section 4

Identification of Capacitors and Ballasts Containing PCBs

Manufacturers of ballasts and capacitors use distinct catalogue and date codes to identify their product, its date of manufacture, and, for some capacitors, its dielectric fluid. In a ballast filled with asphalt, the capacitor is not very accessible. Therefore, correctly interpreting the manufacturer's codes on the ballast is very important in determining whether a ballast could contain a PCB capacitor. The following section contains information to assist in interpreting these codes.

A NOTE OF PRECAUTION:

DO NOT ATTEMPT TO REMOVE AN ENERGIZED BALLAST FROM ITS MOUNT IN THE LAMP FIXTURE. Under no circumstances should an inexperienced or untrained person attempt to remove a ballast unless the electrical current is **SWITCHED OFF** and locked or otherwise protected to ensure that the current cannot be reactivated while the ballast is being removed.

4.1 Capacitor Manufacturers

4.1.1 Aerovox Canada Limited

Aerovox manufactures capacitors for use in a variety of electrical equipment, including lighting systems assembled and sold by other manufacturers in Canada and the USA. Aerovox switched to non-PCB capacitors in 1979 and capacitors manufactured before 1979 could contain PCBs.

Capacitors manufactured by Aerovox have date codes and catalogue codes stamped on the capacitor can. Therefore, if a fluorescent or HID lamp ballast has been disassembled,

information on the ballast capacitor can be checked to determine if the capacitor contains PCBs. The date code consists of four digits, identifying the year and week of manufacture. For example, the code **8252** indicates that the capacitor was manufactured in the 52nd week of 1982. The date code could be preceded by two letters that indicate which country the capacitor was manufactured in. The letters **AE** indicate that the capacitor was manufactured in Canada; the letters **AH** indicate that the capacitor was manufactured in the United States.

The catalogue code could also be used to determine whether the capacitor contains PCBs. Before 1979, the code had the following form: **P 193 FC**. The first unit, which identifies the material of the capacitor plate, is either **P**, **Z**, **H**, or **N**. The second, third and fourth units (numbers) identify the capacitor's size. The fifth and most important unit is either **G**, **R**, or **F**. An **F** identifies that the ballast capacitor contains PCBs. A **G** or an **R** indicates a non-PCB capacitor. The sixth and final unit is a letter from A to R which identifies the particular brand of dielectric liquid.

After 1979, the catalogue code had the following form: **Z 93 P 3417 E**. As Aerovox capacitors made after 1979 do not have PCBs, a capacitor with such a catalogue code does not contain PCBs. Capacitors with the old style of catalogue code or a date code indicating that the capacitor was manufactured before 1979 could contain PCBs.

Aerovox, like other capacitor manufacturers, voluntarily included the words **NO PCB** on capacitors manufactured after 1979 (Photo 4).



Photo 4 Ballast Capacitor. An Aerovox capacitor with **NO PCB** stamped on the can. The label markings indicate that this capacitor was made in the 19th week of 1987.

4.2 Ballast Manufacturers and Suppliers

4.2.1 Advance Ballasts

In Canada, Advance fluorescent ballasts are supplied by Philips Lighting but Advance has its own date code system which is different from that used by Philips.

The date code is stamped on the ballast cover. An example code would be **1-90**. The first digit represents the month of manufacture and the second and third digits represent the year of manufacture. The code **1-90** therefore indicates that the ballast was manufactured in January 1990.

Advance ballasts manufactured before 1978 could contain PCB capacitors. Those manufactured during 1978 could also contain PCB capacitors because 1978 was a transition year during which the use of PCB capacitors was phased out. Ballasts manufactured from 1979 onwards do not contain PCB capacitors.

4.2.2 Allanson Division of Jannock Limited

Allanson switched from PCB to non-PCB capacitors in 1980. The catalogue identification code stamped on the ballast nameplate identifies whether an Allanson ballast contains a PCB capacitor.

The code consists of two letters representing the year and month of manufacture. An example code would be **DM**. The first letter, **D**, represents the month of manufacture, i.e., April. The second letter, **M**, represents the year of manufacture, with the letter **A** representing the year 1969 and the letter **Q** being omitted in the series. In this example, **M** represents 1981. Ballasts with the code **AM** and higher do not contain PCB capacitors.

In May 1987, Allanson switched from alpha to numeric coding (i.e., May 1987 = **0587**). Ballasts produced after this date have **NO PCB** on the product label.

Allanson uses the same catalogue identification code for their HID ballasts as for their fluorescent lamp ballasts. A more specific method to determine whether an

Allanson HID ballast contains a PCB capacitor, however, is to check the type number located on the ballast nameplate. If the number has the prefix N, the ballast does not contain PCB capacitors. If the N does not appear, the ballast contains PCB capacitors (Photo 5).

4.2.3 Canadian General Electric

Canadian General Electric (CGE) switched to non-PCB capacitors in March 1978. The label on a typical CGE ballast has the following type of manufacturer's code: **17 A 28 7 E**.

The final letter of this code indicates whether the ballast capacitor contains PCBs (Photo 6a). If the final letter is N or A, then the ballast capacitor probably contains PCBs. If the final letter is E, or any combination with E, such as **E1**, **ER**, or **EW**, the ballast capacitor does not contain PCBs (E stands for environmental). If the final letter is T, the ballast capacitor may contain PCBs (Photo 6b). It is unfortunate that the identification cannot be more

positive but the problem arose from the fact that Canadian General Electric used a **T** to identify ballasts manufactured up until shortly after they switched to using a non-PCB dielectric fluid in March 1978. Since the switch to **E** did not occur at the same time as the changeover to non-PCB capacitors, the **T** does not confirm that the ballast has a non-PCB capacitor.

In Canada, some codes on CGE ballasts included the letter **W** after the **E** or **T** code to indicate an extended warranty period.

Canadian General Electric also stamped a date code on the back of the ballast housing or on the nameplate. If the manufacturer's code ends with **T**, the date code can be used to more accurately determine whether the ballast contains a PCB capacitor. If a person has access to a de-energized, unmounted ballast, the date code can easily be read on the ballast housing (Photo 6c).

Ballasts manufactured before March 1978 could contain PCB capacitors. The code shown in Photo 7, **2811**, is interpreted by

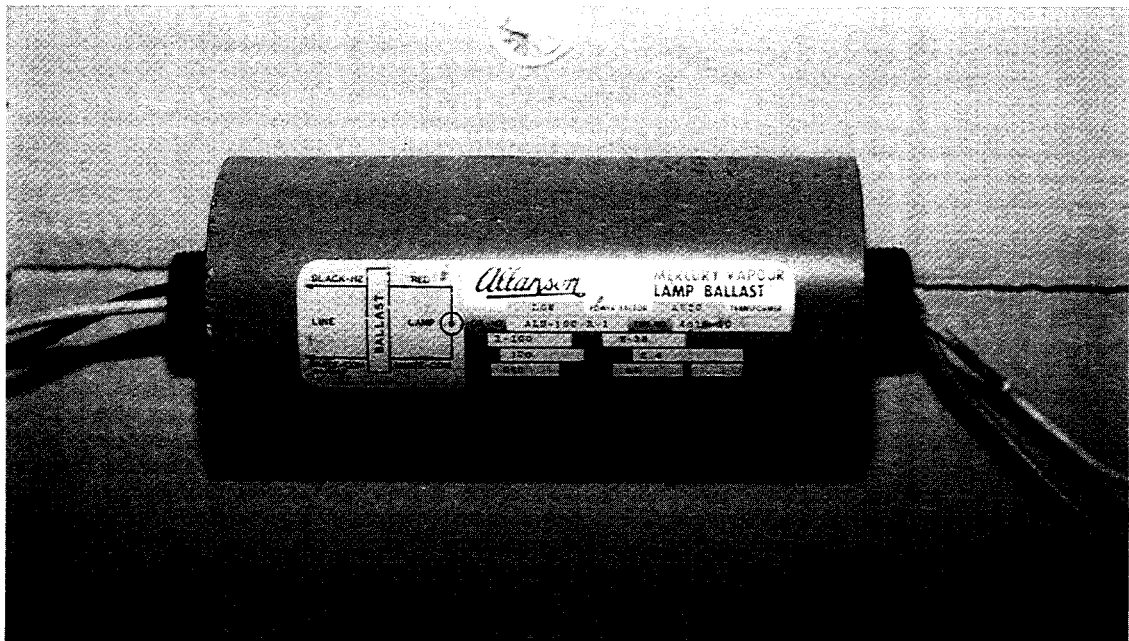
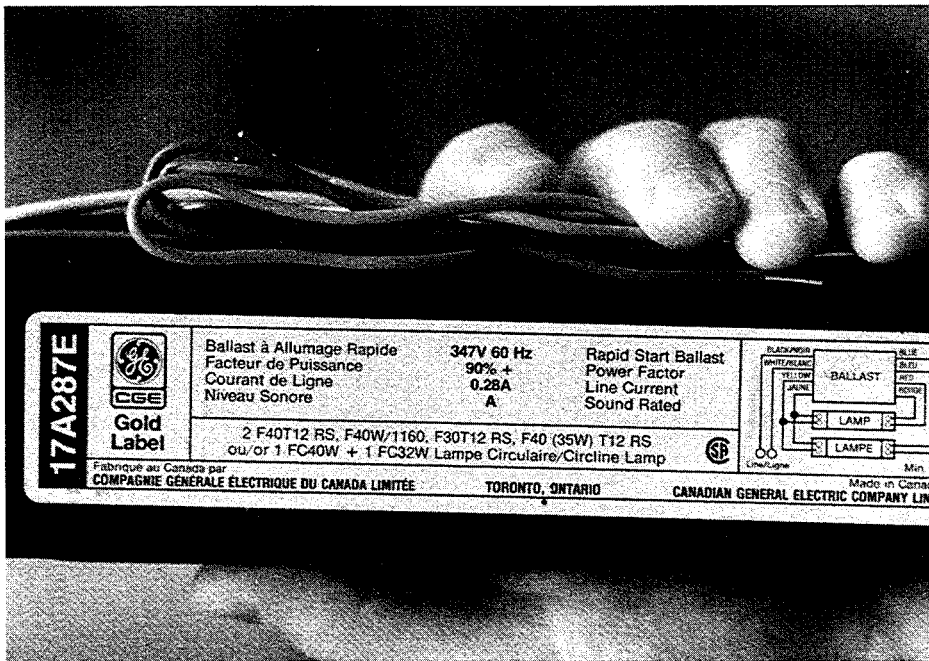
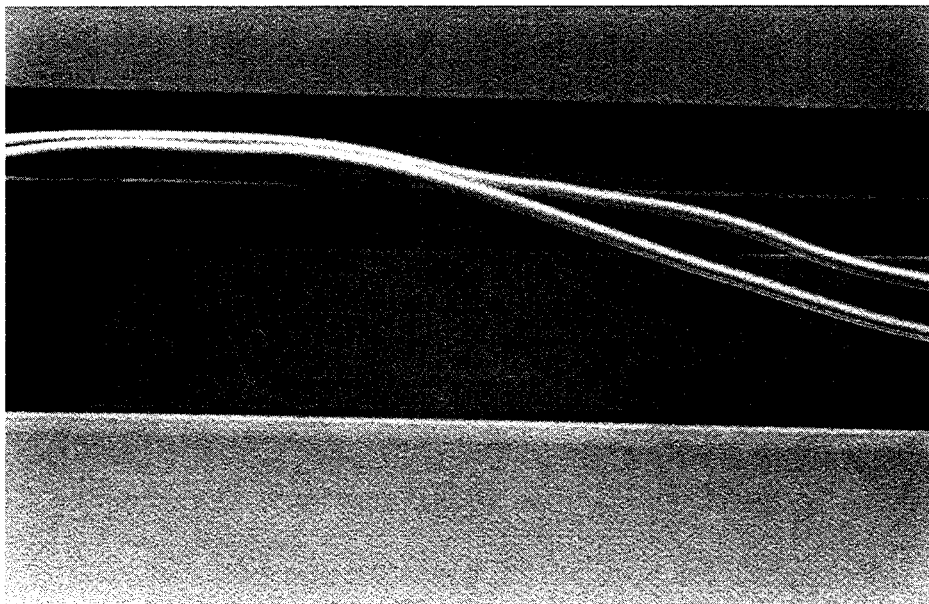


Photo 5 Allanson High Intensity Discharge (HID) Lamp Ballast. The AL at the beginning of the catalogue number indicates that this ballast was made in January (A), 1980 (L). This ballast contains PCBs.



- 6a. The **E** at the end of the manufacturer's code, **17A287E**, clearly identifies this CGE ballast as a non-PCB unit.



- 6b. The **T** at the end of the manufacturer's code, **17A187T**, identifies this ballast as possibly containing PCBs. The date code must be checked to determine PCB or non-PCB status.

Photo 6 Canadian General Electric Lamp Ballasts

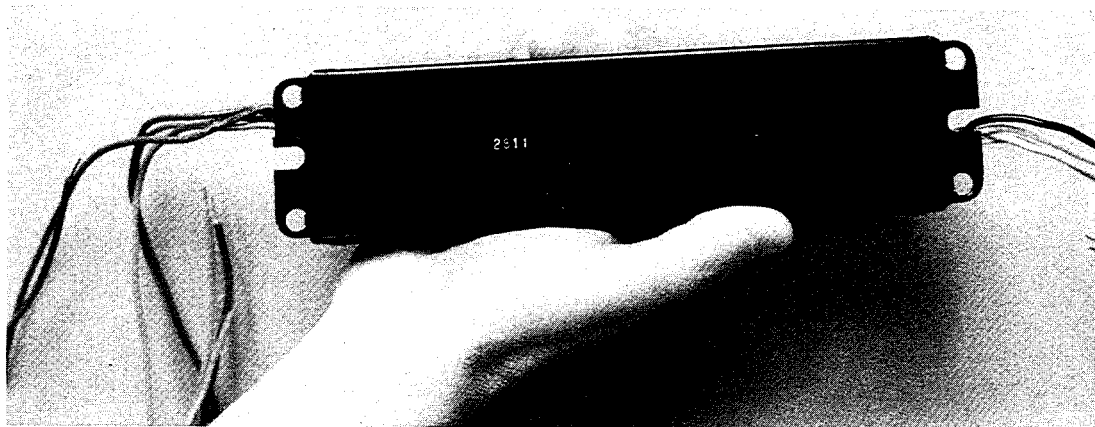


Photo 6c. Example of a Manufacturer's Date Code. The first two digits on this date code must be reversed to determine the year of manufacture. This CGE ballast was made in November (11), 1982 (28).

Photo 6 Canadian General Electric Lamp Ballasts (cont.)

reversing the first two numbers to determine the year of manufacture. The last two numbers represent the month of manufacture. The ballast shown was manufactured in November (11), 1982 (28).

Date codes from **8703** onwards designate non-PCB ballasts, regardless of the manufacturer's code on the label.

Finally, the CGE coding method applies to both HID and fluorescent lamp ballasts.

4.2.4 Holophane Canada Inc.

Holophane manufactures only HID lamp ballasts. Any ballasts manufactured before 1978 contain PCB capacitors while those manufactured after 1980 do not contain PCB capacitors. If a ballast was manufactured between 1978 and 1980, it may contain a PCB capacitor.

If the capacitor is accessible, the Holophane alphanumeric system can be used to assist in determining whether the capacitor contains PCBs. Capacitors marked **BAA nnn** contain PCBs; capacitors marked **BAB nnn** do not

contain PCBs (where **nnn** is a numeric sequence).

4.2.5 Magnatek Polygon

Magnatek Polygon does not manufacture ballasts in Canada. It imports them from Magnatek Universal Manufacturing in the United States for use in Canada. The date code on the ballast will be one of three types:

218 XX XX if made before 1968

J XX XX if made after late 1967

W XX XX if made after 1977

In all three cases, the four Xs are numbers which represent the year and month of manufacture. For example, the code **J 67 12** identifies a ballast made in December 1967. If **High Power Factor** appears on the label and the ballast was manufactured before 1978, it contains at least one PCB capacitor. Any ballasts manufactured after January 1978 contain PCB capacitors unless there is either a green sticker or **NO PCB** appears on the ballast label. Ballasts manufactured after July 1980, do not contain PCB capacitors.

This coding scheme applies to both fluorescent and HID lamp ballasts.

4.2.6 *Magnatek Universal Manufacturing (USA)*

High power factor ballasts manufactured by Magnatek Universal Manufacturing are clearly identified with a date code located on the side of the ballast cover opposite the company label. The date code consists of a letter prefix representing the month and a two-digit number representing the year. For example, the code **C79** identifies a ballast manufactured in March 1979.

Magnatek Universal Manufacturing switched to using non-PCB capacitors in 1978 and since then all ballasts containing non-PCB capacitors have been marked **NO PCB**. Also, for approximately two years after the switch to non-PCB capacitors, all catalogue numbers for equipment containing a non-PCB capacitor included an **N** suffix.

High Intensity Discharge lighting manufactured by Magnatek Universal Manufacturing containing non-PCB capacitors is marked **NO PCB** on either the outside of the unit or directly on the capacitor can inside the unit.

4.2.7 *Philips Lighting*

Fluorescent ballasts manufactured by Philips Lighting are identified with a three- or four-digit manufacturing date code stamped onto the ballast housing, on a tab on the side, or on the side facing the ceiling.

Before 1980, these codes represented only the month and year of manufacture. For example, a three-digit code, such as **575**, represents May (5), 1975 (75). A four-digit code, such as **1175**, represents November (11), 1975 (75). If the ballast was manufactured after 1980, this particular code could also be interpreted as indicating the

year of manufacture as 1981 from the first digit (1); the week of manufacture as the seventeenth week, from the next two digits (17); and the day of manufacture as the fifth day, from the last digit (5).

Philips stopped using PCB capacitors in late 1978. All ballasts manufactured *after* early 1979 were non-PCB units, and marked as such on the label. In other words, if a ballast manufactured by Philips was stamped with the code **1175** and was *not* marked on the label as a non-PCB unit, it was manufactured in 1975 and would contain PCBs. The markings on the label should be checked on ballasts which have an older appearance and are stamped with four-digit codes.

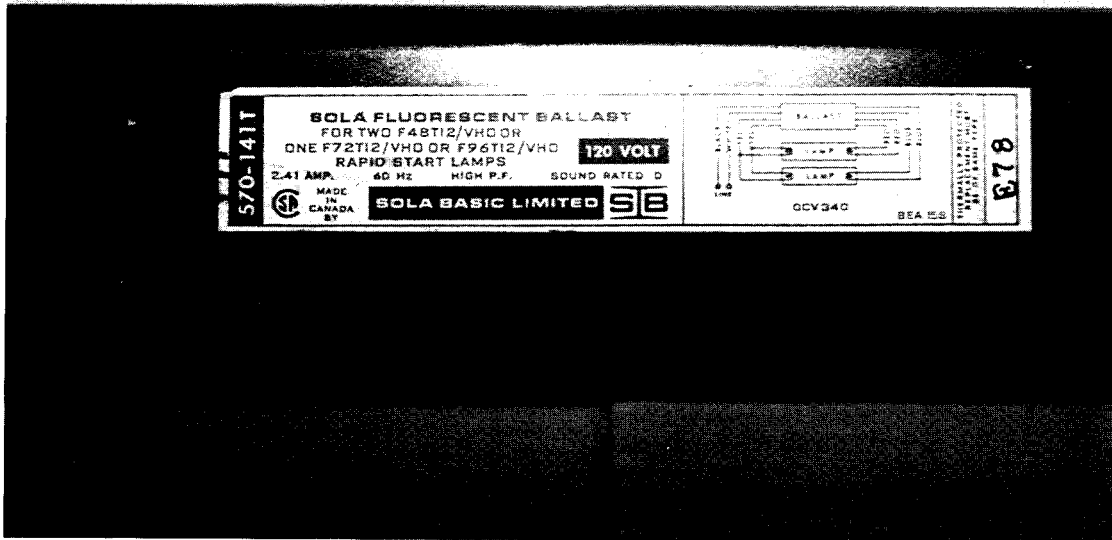
All HID ballasts manufactured by Philips are clearly marked on the capacitor as either **PCB** or **non-PCB**.

4.2.8 *Sola Canada*

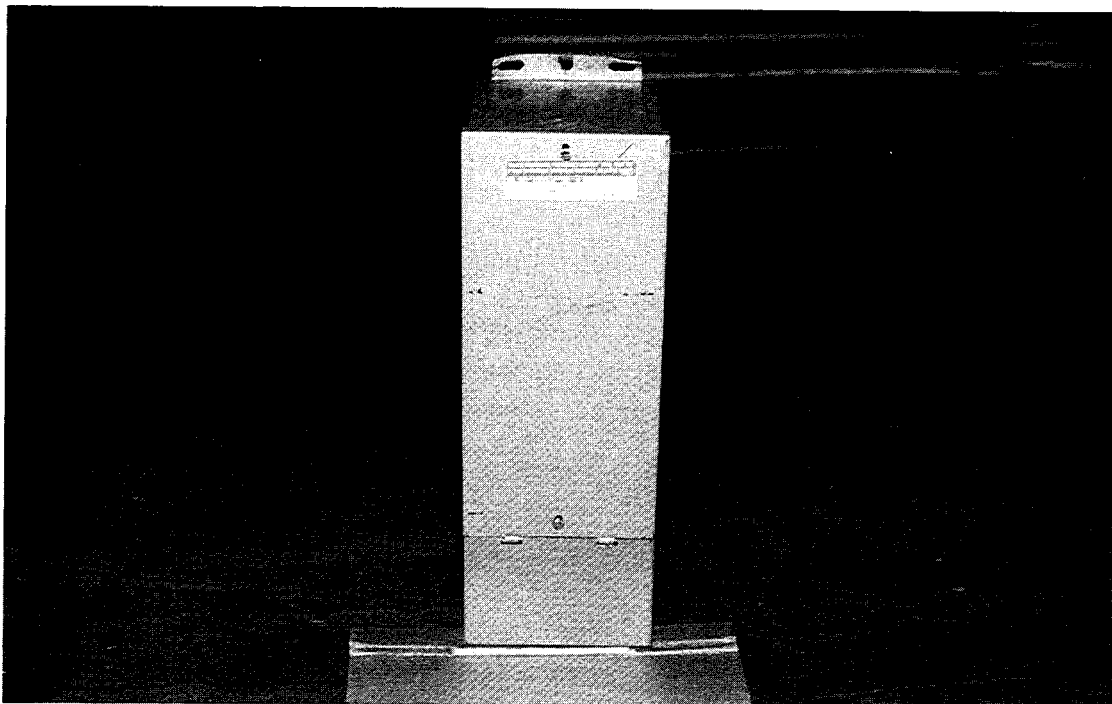
The date of manufacture of Sola ballasts can be determined from the date code on the ballast label (Photo 7). An example code would be **A68**.

The letter indicates the month of manufacture (A = January, B = February, etc.) and the numbers represent the year of manufacture (e.g., 68 = 1968). Any ballast manufactured by Sola in 1980 or later, i.e., with date code **A80** or later, does not contain PCBs. It should be assumed that all ballasts manufactured by Sola Canada before January 1980 contain PCB capacitors unless otherwise indicated on the ballast.

This also applies to HID ballasts, but if the capacitor is accessible, the PCB content of the capacitor can be determined using the Sola part number stamped on the capacitor. An example code would be **ACA 109**. If the first three letters are **ACB**, then the capacitor is non-PCB. If the first three letters are **ACA**, then the capacitor contains PCBs.

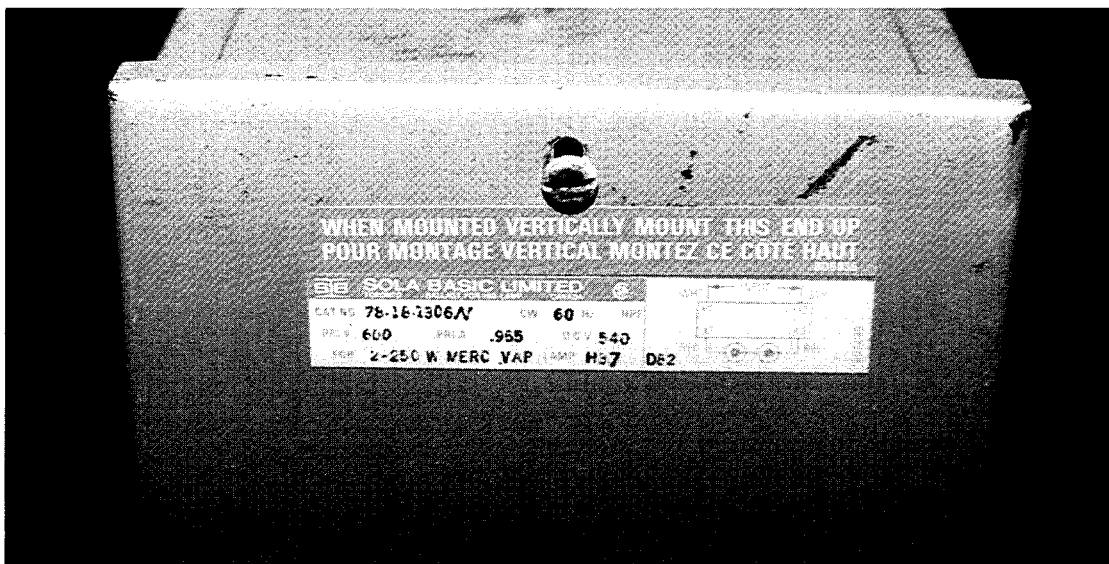


- 7a. A Sola Canada fluorescent lamp ballast. The **E78** at the far right of the label indicates that this ballast was made in May 1978 and, therefore, contains a PCB-filled capacitor.



- 7b. A Sola Canada HID lamp ballast.

Photo 7 Sola Canada Lamp Ballasts



- 7c. Close-up of the ballast label showing the date code stamped near the circuit diagram. **D82** indicates that the ballast was made in April 1982, and is a non-PCB unit.

Photo 7 Sola Canada Lamp Ballasts (cont.)

4.2.9 Sola Electric (USA)

Fluorescent lamp ballasts manufactured by Sola USA are marked with the company name, address, and ratings on a nameplate affixed to the metal housing. These ballasts are also marked with a code showing manufacturing date and location. An example of a code is: **61 F 311 EG**.

The first two numbers, **61**, indicate the year of manufacture (1961). The letter **F** indicates the month of manufacture (F = sixth month, June). The **311** is the serial number of a particular manufacturing lot. This number can be 1 to 4 digits and may not be used for all lots. **EG** indicates that the ballast was manufactured in the Sola plant in Elk Grove Village, Illinois. **FP** indicates manufacture in the Sola plant in Fort Payne, Alabama.

Sola USA stopped producing their standard line of fluorescent ballasts in 1975. All types of ballasts manufactured by Sola USA in 1979 or before could contain PCB capacitors.

4.2.10 Westinghouse Canada

Westinghouse Canada manufactured both fluorescent and HID lamp ballasts until the early 1970s. After that, their fluorescent lamp ballasts were manufactured by Canadian General Electric with Westinghouse labels. Westinghouse continued manufacturing HID lamp ballasts until 1982.

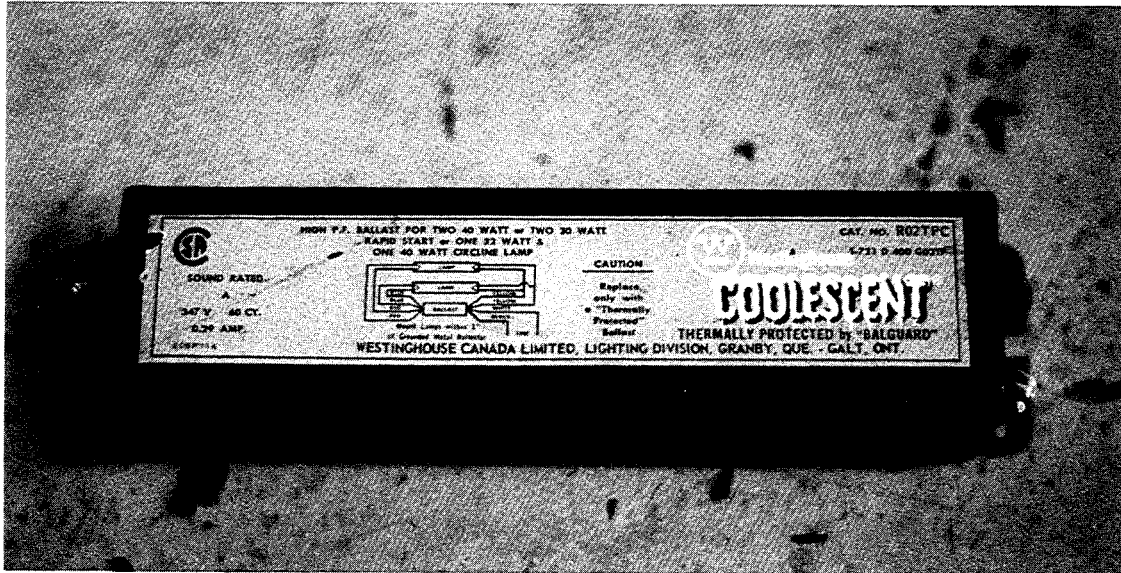
Westinghouse stamped date codes on each fluorescent ballast enclosure and on each HID product label and HID core/coil ballast label (Photo 8b and 8d). At first, Westinghouse used an alphanumeric date code on their fluorescent ballasts; then they switched to a strictly numeric date code.

An example of an alphanumeric code would be **A-78** with the letter representing the month of manufacture (A=January, B=February, etc.) and the numbers representing the year of manufacture (e.g., 78=1978). The numeric code was in the form **01-99** with the first two numbers

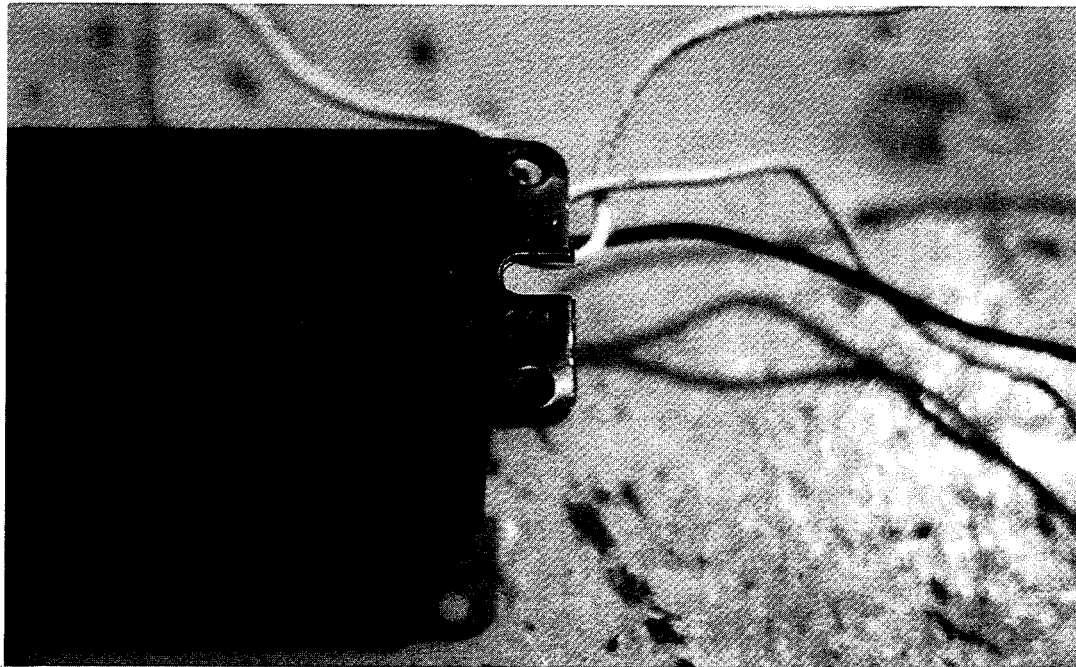
representing the month of manufacture (e.g., 12 = December).

When CGE began manufacturing fluorescent ballasts for Westinghouse, the CGE date code system was used (see section 4.2.3).

Westinghouse continued to use the alphanumeric date code system on their HID ballasts. Fluorescent ballasts made from 1978 onwards have **NO PCB** marked on the label.

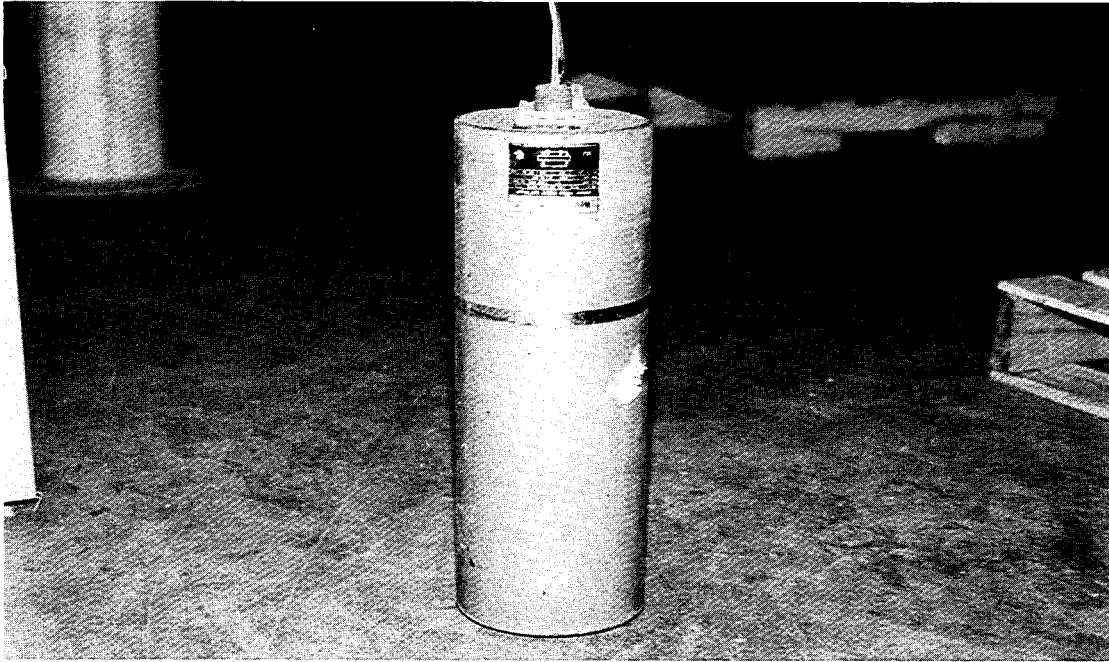


8a. A Westinghouse fluorescent ballast. The date code is on the bottom of the ballast.



8b. Here the date code, 1271, is visible. The code indicates that the ballast was made in December, 1971.

Photo 8 Westinghouse Canada Lamp Ballasts

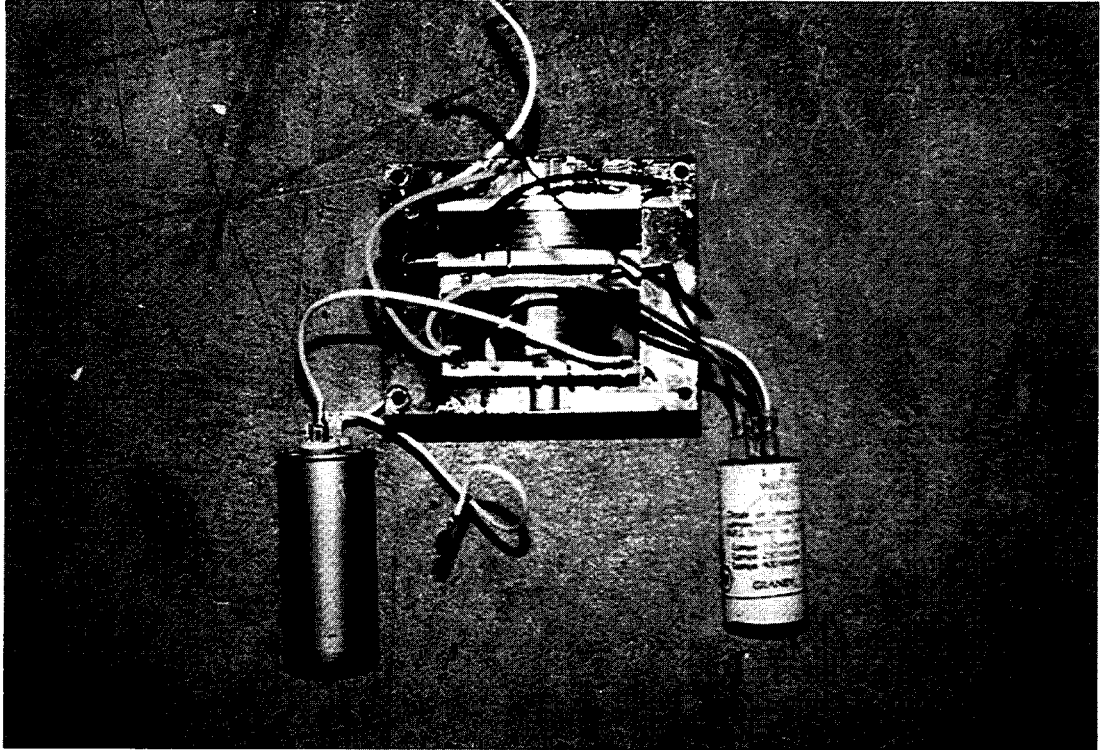


8c. A Westinghouse HID lamp ballast.



8d. Close-up of Photo 8c. The date code, G/73 (located below the word "BALLAST"), indicates that the ballast was made in July 1973, and contains PCB-filled capacitors.

Photo 8 Westinghouse Canada Lamp Ballasts (cont.)



8e. Westinghouse HID ballast showing components.

Photo 8 Westinghouse Canada Lamp Ballasts (cont.)

Section 5

Storage and Disposal

The federal government has published an Interim Order on the Storage of PCB Wastes. This Order specifies requirements for storage of PCB waste, including site location and access, fire protection and emergency procedures, maintenance and inspection, labelling, maintenance of books and records, and reporting requirements.

According to the Interim Order, PCB wastes include PCB liquids, PCB solids, and PCB equipment taken out of service for the purpose of disposal. PCB equipment includes PCB capacitors. Lamp ballasts containing PCB capacitors automatically qualify as PCB waste and must be stored according to the requirements of the Interim Order.

The Interim Order applies to all federal and provincial storage sites, except those in

provinces where legally enforceable requirements have been put in place that are comparable in effect to the Order.

With the exception of federal PCB wastes, the provinces are responsible for disposing of PCB wastes in Canada. Consequently, for non-federal wastes, the appropriate provincial environment agency should be consulted for specific provincial requirements for PCB waste disposal. These offices are listed in Appendix B.

The federal government is currently planning to turn the Interim Order into a regulation. Anyone involved in storing or disposing of lamp ballasts should confirm the current regulatory requirements with Environment Canada. Environment Canada's regional offices are listed in Appendix A.