CTA BUSES

★ PROPANE

★ GASOLINE

★ DIESEL

★ TROLLEY

Chicago Transit Authority operates a fleet of over 3,000 buses. Almost half are propane buses; the remainder are gasoline, diesel, and trolley buses.

PROPANE BUSES

Propane has been used as a fuel for buses for only a comparatively short number of years. Chicago Transit Authority purchased the first of its large fleet of these buses in 1950. It was the first transit company to use propane buses on a large scale.

Propane is a by-product of the petroleum industry. In its natural state propane is a gas and is impractical to handle. However, when put under pressure it becomes a liquid and can be stored in tanks. When released from pressure it returns to its gaseous state. Propane is manufactured under pressure, transported to storage tanks under pressure, transferred from storage tank to bus tank under pressure, and carried in the bus tank and fuel line under pressure.

Propane will burn only when in a gaseous state and mixed with air. If a break or leak occurs in a fuel tank or fuel line, pressure is lost as the fuel escapes and the escaping gas can ignite. Because propane escapes as a gas and can not be seen, an odor similar to cooking gas has been added to the fuel so that leaks can be detected. In the event of a break or leak, the source of the fuel supply should be cut off by closing the fuel shut-off valve located on the fuel tank.

To minimize the chance of breaks or leaks, every precaution has been taken in the construction of CTA's propane buses. The tank is constructed of heavy 1/4 inch collision-proof steel capable of withstanding internal pressures of 1,000 pounds, although the pressure of propane does not exceed 190 pounds. The tank, valves, and fittings are recessed and well protected. The fuel line is heavy-duty seamless stainless steel capable of withstanding high pressures. All joints are flanged and welded.

Propane can be ignited in a bus engine only when it is changed to gas and mixed in proper proportions with air. Liquid propane is changed to gas by means of a pressure regulator and a vaporizer. The gas is then drawn into the carburetor where it is mixed with air. From the carburetor, the gas and air mixture enters the cylinders where it is ignited by the spark plugs.

Because propane enters the engine as a gas, it burns clean and completely; it is quiet and leaves no carbon deposits, no smoke, no obnoxious exhaust odors.

To stop a propane engine, the ignition switch is used to open the ignition circuit. All propane buses are equipped with air brakes.

GASOLINE BUSES

The gasoline bus engine is similar in operation to the automobile engine. A mixture of gasoline and air is drawn through the carburetor into the cylinders where it is ignited by spark plugs. To stop a gasoline engine, the ignition switch is used to open the ignition circuit. All gasoline buses are equipped with air brakes.

DIESEL BUSES

Unlike a gasoline engine, the diesel engine does not have spark plugs to ignite the fuel. In the diesel engine, air is compressed in the cylinders; then a charge of diesel fuel is sprayed into the cylinders. The tremendous heat generated by the compression ignites the fuel. To stop a diesel engine, the engine control switch is used to cut off the fuel supply. All diesel buses are equipped with air brakes.

TROLLEY BUSES

Trolley buses are powered by an electric motor which uses 600 volt direct current. Power is transmitted through a system of overhead wires. The right-hand wire (curb side) is the negative wire; the other wire is the positive wire. To prevent danger of electric shock when handling trolley poles, the power pole should be handled only when the negative pole is up. When putting poles up, the right-hand (negative) pole is put up first; when taking poles down, the right-hand pole is removed last.

The trolley bus braking system is a combination of dynamic and air brakes. Dynamic braking is provided by the bus motor. When the brake pedal is applied, the bus motor acts as a generator and converts the mechanical energy of the movement of the bus into electrical energy. This electrical energy creates a force opposite to the rotation of the armature, causing the motor to slow down. Initially, when the brake pedal is depressed, the dynamic brake provides virtually all the braking power, but as the dynamic brake fades out due to decreased speed the air brake takes effect. Just before the bus comes to a complete stop the dynamic brake fades out completely and the air brake alone completes the stop.

CHICAGO TRANSIT AUTHORITY
TRAINING & ACCIDENT PREVENTION
61-C1-5/61 2M