

THE LOW WATER SHUT-OFF SENSES A BOILER LOW-WATER CONDITION AND SHUTS DOWN BURNER BEFORE BOILER DAMAGE CAN OCCUR. CONNECTED TO THE BOTTOM OF THE BOILER AND TO THE BURNER FUEL SUPPLY, A PROPER WATER LEVEL IN THE BOILER KEEPS THE CENTER BRASS TUBE COOL. ON A LOW WATER CONDITION THE BRASS TUBE FILLS WITH STEAM AND EXPANDS LENGTHWISE TO CLOSE OFF THE FUEL FLOW TO THE

WHEN CLOSED THE WATER AUTOMATIC BYPASS VALVE FORCES ALL WATER FROM THE PUMPS TO ENTER THE BOILER. THIS VALVE IS USED TO MANUALLY CONTROL THE WATER LEVEL SHOULD A PROBLEM OCCUR WITH THE WATER AUTOMATIC OR IT BECOMES DESIRABLE TO OVERFILL THE BOILER. A WATER FILTER BELOW THE VALVE INSURES NO FOREIGN MATTER FINDS ITS WAY INTO THE VARIOUS VALVES IN THE WATER LINE.

A FINE SCREEN INSIDE THE FUEL FILTER INSURES NO FOREIGN MATTER FINDS ITS WAY INTO THE VARIOUS VALVES IN THE FUEL LINE OR CAN PLUG THE FINE NOZZLE OPENINGS IN THE BURNER.

A PAIR OF WHEEL-DRIVEN PUMPS UNDER THE FRONT PASSENGER SEAT PUMP WATER FROM THE MAIN TANK TO THE BOILER. THE BOILER CHECK VALVE OPENS ALLOWING WATER TO ENTER THE BOILER WHEN THE WATER AUTOMATIC CALLS FOR WATER TO BE ADDED TO THE BOILER. WHEN THE WATER AUTOMATIC IS RETURNING WATER TO THE MAIN TANK THE BOILER CHECK CLOSING KEEPING BOILER PRESSURE ISOLATED FROM THE WATER PUMPS.

## UNDER THE HOOD RIGHT SIDE

TO LUBRICATE THE CYLINDER WALLS AND PISTONS STEAM OIL MUST BE MIXED WITH THE STEAM SUPPLY TO THE ENGINE. AS THIS STEAM IS ABOUT 600 DEGREES FARENHEIT SPECIAL OIL MUST BE USED THAT WILL RETAIN IT'S LUBRICATING QUALITIES UNDER EXTREAME HEAT AND PRESSURE. STEAM OIL IS THE CONSISTENCY AND COLOR OF HEAVY MOLASSIS AND IS INJECTED INTO THE STEAM LOOP.

BOILER STEAM IS CALLED SATURATED STEAM BECAUSE IT IS THE SAME TEMPERATURE AS THE WATER. TO IMPROVE ENGINE EFFICIENCY, ADDITIONAL HEAT IS ADDED TO THE STEAM BY PASSING IT THROUGH A "SUPERHEATER" PIPE ROUTED OVER THE BURNER FIRE. THE EXPANSION LOOP ALLOWS THE SUPERHEATER PIPING AND THE PIPING BACK TO THE ENGINE TO EXPAND AND CONTRACT WITHOUT BUILDING UP STRESSES THAT MIGHT RUPTURE THE PIPE.

THE SMOKEBOX IS A CHAMBER ABOVE THE BOILER WHERE THE COMBUSTION GASSES FROM EACH OF THE FLUES IS COLLECTED AND PASSED DOWN UNDER THE CAR IN AN EXHAUST DUCT AT THE REAR OF THE BOILER.

THE BOILER GENERATES 600 PSI NOMINAL OPERATING PRESSURE STEAM FOR CAR'S OPERATION. RATED AT 20 BOILER HORSEPOWER THE VERTICAL FIRE-TUBE DESIGN MEASURES 23" DIAMETER BY 18" HIGH. CONSTRUCTED OF BOILER STEEL THERE ARE AROUND 700 STEEL FLUES. THE OUTSIDE OF THE BOILER IS WRAPPED WITH 3 LAYERS OF 300,000-POUND TENSILE STRENGTH PIANO WIRE.

THE WATER AUTOMATIC MAINTAINS PROPER BOILER WATER LEVEL. THE CENTER BRASS TUBE IS CONNECTED TO THE TOP AND BOTTOM OF THE BOILER. WHEN THE BOILER WATER LEVEL IS ABOVE THE HEIGHT OF THE BRASS TUBE THE TUBE IS FULL OF WATER AND COOL. WATER BEING PUMPED FROM THE SUPPLY TANK IS RETURNED TO THE SUPPLY TANK. WHEN THE WATER LEVEL IS BELOW THE LEVEL OF THE BRASS TUBE THE TUBE FILLS WITH STEAM CAUSING IT TO EXPAND. WATER FLOW BACK TO THE SUPPLY TANK IS BLOCKED AND THE PUMPED WATER IS FORCED INTO THE BOILER.