

IDENTICAL TO A STEAM LOCOMOTIVE, THE STANLEY STEAM CAR HAS TWO PISTONS. THE 20 HORSEPOWER CARS HAVE 4" DIAMETER CYLINDERS AND 5" STROKE. AT 600 PSI BOILER PRESSURE THE FORCE EACH PISTON PROVIDES IS OVER 3-1/2 TONS! THE ENGINE IS DOUBLE-ACTING MEANING THAT STEAM PUSHES ALTERNATELY ON BOTH SIDES OF THE PISTON. THE STANLEY ENGINE PROVIDES THE SAME NUMBER OF POWER IMPULSES PER REVOLUTION AS AN 8-CYLINDER INTERNAL COMBUSTION ENGINE PROVIDES. THE DIFFERENCE BEING THAT IN THE STEAM ENGINE THE CUSHION-LIKE EXPANSIVE FORCE OF THE STEAM IS MUCH MORE EVEN THAN THE HAMMER-LIKE EXPLOSION OCCURING IN THE GAS ENGINE. THE STANLEY ENGINE DEVELOPS MAXIMUM POWER FROM STANDSTILL AND UNLIKE THE GAS ENGINE CAN DEVELOP MAXIMUM POWER AT ALL OPERATING SPEEDS.

STEAM FROM THE BOILER ENTERS THE ENGINE HERE. BY VARYING THE THROTTLE POSITION THE AMOUNT OF STEAM PASSED FROM THE BOILER TO THE ENGINE IS VARIED AND THUS THE SPEED OF THE ENGINE IS CONTROLLED. CYLINDER LUBRICATION IS PROVIDED BY OIL INJECTED INTO THE STEAM SUPPLY. CARRIED BY THE STEAM THE OIL LUBRICATES THE ENGINE CYLINDER AND CYLINDER RINGS.

THE EXHAUST STEAM FROM THE ENGINE IS ROUTED TO A HEAT EXCHANGER WHERE STEAM'S HEAT IS USED TO PREHEAT THE FEED WATER TO THE BOILER.

A PAIR OF D-SHAPED SLIDE VALVES ADMITS STEAM TO ALTERNATE SIDES OF EACH OF THE TWO PISTONS. THE MOTION OF THE VALVES MUST BE EXACTLY TIMED WITH THE MOVEMENT OF THE PISTONS SO THAT STEAM AT BOILER PRESSURE MAY BE PROPERLY ADMITTED ALTERNATELY TO EACH SIDE OF EACH PISTON. THE SLIDE VALVES ALSO EXHAUST SPENT STEAM FROM THE CYLINDERS. THE MOTION OF THE VALVES IS THROUGH A MECHANICAL LINKAGE KNOWN AS STEPHENSON VALVE GEAR. THE HOOK-UP PEDAL TO THE LEFT OF THE BRAKE PEDAL CONTROLS THE OPERATION OF THE ENGINE VALVES THROUGH THIS CONNECTION. THERE IS NO TRANSMISSION FOR A STANLEY AS THE SINGLE PEDAL PROVIDES BOTH FORWARD AND REVERSE CONTROL. STANLEY STEAM CARS CAN MOVE AS FAST BACKWARDS AS THEY DO FORWARDS!

THE PUMP DRIVE OPERATES FOUR PUMPS LOCATED UNDER THE FRONT PASSENGER SEAT. A PAIR OF 3/4" BORE PUMPS DELIVER WATER TO THE BOILER. A SINGLE 1/4" BORE PUMP PROVIDES KEROSENE AT 140 PSI TO THE MAIN BURNER. THE FINAL PUMP INJECTS STEAM OIL INTO THE STEAM SUPPLY LINE

STANLEY BRAKES ARE MECHANICAL. THE FOOT BRAKE IS A CONTRACTING BAND ON THE EXTERIOR OF THE BRAKE DRUM. INSIDE THE DRUM IS AN EXPANDING BRAKE THAT SERVES AS THE PARKING BRAKE. MANY STANLEYS HAVE HAD MORE EFFECTIVE HYDRAULIC BRAKES INSTALLED AND THE EXTERIOR BRAKE NOW SERVES AS THE PARKING BRAKE.

THE 6-VOLT GENERATOR IS DIRECTLY DRIVEN FROM THE DIFFERENTIAL. THIS MEANS THAT THE CAR MUST BE MOVING AT LEAST 10 MPH FOR THE GENERATOR TO PROVIDE SUFFICIENT POWER. THE ONLY ELECTRICAL ITEMS ON A STANLEY ARE THE LIGHTS AND ELECTIC HORN. THE BATTERY IS LOCATED UNDER THE BACK SEAT.

CONTAINED WITHIN THE COPPER CASE ARE THE PISTON RODS, CROSSHEAD, CRANK RODS, CRANKSHAFT, AND VALVE MECHANISM FOR THE OPERATION OF THE STEAM ENGINE. THE CASE IS FILLED WITH A COUPLE OF INCHES OF LUBRICATING OIL. AS THE CAR MOVES THE MOTION OF THE CRANKSHAFT AND THE DIFFERENTIAL GEARS IS SUFFICIENT TO SPLASH THE OIL OVER THE VARIOUS MOVING PARTS OF THE ENGINE. THE STANLEY ENGINE HAS ONLY 15 MOVING PARTS AND STANLEY LITERATURE ADVERTISED ONLY 37 MOVING PARTS ON THE WHOLE CAR! THE GEAR ON THE CRANKSHAFT HAS 40 TEETH WHILE THE DIFFERENTIAL GEAR HAS 60 TEETH (1.5 - 1 RATIO). THERE IS NO TRANSMISSION, CLUTCH, OR SIMILAR MECHANISMS REQUIRED FOR A STANLEY.

THE STANLEY ENGINE UNDER THE REAR OF THE CAR