

Title (en)

Fuel-injection device for internal combustion engines, especially for diesel engines.

Title (de)

Kraftstoffeinspritzeinrichtung für Brennkraftmaschinen, insbesondere für Dieselmotoren.

Title (fr)

Installation d'injection de combustible pour moteurs à combustion interne, notamment pour moteurs diesel.

Publication

EP 0032168 A1 19810722 (DE)

Application

EP 80106901 A 19801108

Priority

DE 3001051 A 19800112

Abstract (en)

1. Fuel injection device for internal combustion machines, in particular for diesel engines, having, for each working cylinder, one mechanically driven pump piston (14a-14d; 14a'-14d') of an injection pump (12a-12d) supplied by a feed pump (33) with fuel under supply pressure, having, for each working cylinder, a control spool valve (24; 24') operable by the control pressure of a control fuel source (32) common to all the injection pumps, which control spool valve is inserted in a transfer duct (22) continually connected with the pump working space (18) and closes this duct for the initiation of the beginning of injection and opens it again for the termination of injection, and having a control device (48; 48'; 48'') by means of which the control pressure can be switched via control lines (29) to the pressure spaces (28) of the control spool valves (24; 24'), characterised by the following features : a) the control fuel source (32) is formed by the feed pump (33) designed for a control pressure (ps) increased by a multiple relative to the supply pressure (pv) of the injection pumps (12a to 12d) and by a first pressure limiting valve (35) limiting the control pressure (ps) in a control pressure line (31) which can be connected to the control lines (29) ; b) a second pressure limiting valve (37), which determines the supply pressure (pv) occurring in the filling lines (21) separated from the control lines (29), is connected downstream of the first pressure limiting valve (35) ; c) the control device consists of a valve arrangement (36; 48; 48'; 48'') determining in common for all the injection pumps (12a to 12d) the beginning and the duration of the period during which the pressure spaces (28) of the control spool valve (24; 24') are subjected to pressure and of a distributor device (43; 53) separate from this valve arrangement, by means of which distributor device one of the control lines (29) leading to the pressure spaces (28) of the control spool valves (24; 24') can be connected at a time, in synchronism with the injections, to the control pressure line (31) ; d) the control pressure (ps) necessary for operating the control spool valve (24; 24') and to which one of the pressure spaces (28) at a time is subjected via the distributor device (43; 53) is built up by the valve arrangement (36; 48; 48'; 48'') blocking the drainage of the control fuel from the control pressure line (31) into a low pressure line (19) and is released again to the low pressure line (19) for the return stroke of the control spool valve (24; 24').

Abstract (de)

Einspritzbeginn und -ende sind durch einen hydraulisch betätigten Steuerschieber (24) bestimmt. Die vorzugsweise mit einer Einspritzdüse (13) zu einer Pumpe-Düse (10a bis 10d) zusammengebauten Einspritzpumpen (12a bis 12d) der Einrichtung weisen eine zentrale, aus einer Förderpumpe (33) und einem ersten Druckbegrenzungsventil (35) gebildete Steuerkraftstoffquelle (32) auf, die einen gegenüber dem von einem zweiten Druckbegrenzungsventil (37) bestimmten Versorgungsdruck (pv) um ein Mehrfaches erhöhten, den Steuerschieber (24) betätigenden Steuerdruck (ps) erzeugt. Der Steuerschieber (24) wird zur Einleitung des Spritzbeginns über eine Verteilereinrichtung (43) von einer Ventilanordnung (36) unter Steuerdruck (ps) gesetzt und verschließt einen aus dem Pumpenarbeitsraum (18) wegführenden Überströmkanal (22). Zur Steuerung des Spritzendes entlastet der Steuerschieber (24) bei seinem Rückhub diesen Überströmkanal wieder zu einer Niederdruckleitung (19). Der zur Betätigung der Hubbewegung des Steuerschiebers (24) erforderliche Steuerdruck (ps) in der Steuerdruckleitung (31) wird mittels der Ventilanordnung (36) durch Sperren des Abflusses aus dieser Leitung (31) aufgebaut.

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