

Description

This invention relates generally to connectors and more particularly to connectors for sealably coupling fluid lines which conduct pressurized fluid through a bulkhead or partition.

In order to join external and internal fuel supply lines passing through the wall of an engine cylinder head or valve-rocker-arm cover, it has been conventional practice to create at least two joints in the fuel supply path at that location by connecting an elongated bulkhead adapter or union between the fuel lines.

In US-A-3,402,703 issued to Dickerson et al on September 24, 1968 and US-A-3,489,435 issued to Weber et al on January 13, 1970, such an adapter has at each end a conical counterbore and an externally or internally threaded end portion. Each fuel line has a fitting or nut which tightens onto the respective threaded end portion of the adapter and forces, by means of an intermediate slideable ferrule or collar, the end of the respective fuel line against the respective conical counterbore of the adapter.

Some disadvantages of this typical bulkhead fuel line connection, having multiple joints in the fuel supply path, are that assembly of the two fuel lines through the bulkhead is relatively complex and time-consuming, and each additional joint in the fuel supply path may also present more opportunity for improper assembly and consequential high pressure fuel leakage.

Furthermore, it is desirable to minimize the amount of vibration developed in the internal and external fuel lines by securing them to the low-frequency-vibrating engine cylinder head or valve-rocker-arm cover. In US-A-3,402,703, the adapter has external threads which fit a threaded opening in the bulkhead. However, such a securing means is not satisfactory where the adapter is typically made of steel and the bulkhead is made of a lighter weight yet softer material such as aluminum. In such a case, the adapter may be accidentally over tightened or over torqued thereby over stressing the bulkhead or even stripping the internal threads in the bulkhead opening.

GB-A-398346 describes an arrangement in accordance with the precharacterizing part of claim 1. This prior arrangement however, uses a double conical ring which mates with both of the line ends to be joined. The line ends are each flared and are urged onto the ring by contact with frusto-conical internal surfaces on a collar and the fitting through the bulkhead, respectively. As such the arrangement presents two possible leakage paths, and introduces the possibility of poor sealing through misalignment of the lines and variations in the tolerances between the socket and its respective line.

The conventional bulkhead-fuel-line adapters thus require a plurality of fuel path joints between the external and internal fuel supply lines. Such a configuration is relatively complex, time-consuming to assemble, and may present more oppor-

tunity for improper assembly and consequential high pressure fuel leakage at each of the multiple fuel path joints in the adapter.

The present invention provides a bulkhead-fluid-line connector in accordance with claim 1 having a single fluid path joint generally where the fluid line assembly passes through the bulkhead. The single connection is relatively easier to properly assemble and minimizes the number of potential sources of high pressure fuel leakage due to improper assembly.

Brief Description of the Drawings

Fig. 1 is a diagrammatic cross-sectional view of an exemplary embodiment of the present invention as incorporated in a valve-rocker-arm cover of an internal combustion engine;

Fig. 2 is a diagrammatic enlarged partial view of Fig. 1 taken in the area indicated by circle II; and

Fig. 3 is a diagrammatic view similar to Fig. 2 of an alternative embodiment of the present invention.

Best Mode for Carrying Out the Invention

Referring to Figs. 1, 2, and 3, wherein similar reference numbers designate similar components in all the views, a typical application of the bulkhead-fluid-line connector 10 is shown for joining and supporting a tubular fluid line assembly 12 which passes through a chamfered aperture 14 of a housing wall 16 associated with an internal combustion engine 18.

The tubular line assembly 12 includes an outer or first fluid line 20 and an inner or second fluid line 22 both of which are adapted to internally conduct a pressurized fluid such as fuel. The housing wall 16 has outside and inside flat parallel surfaces 24, 26, and in the embodiments illustrated, forms an integral part of a valve-rocker-arm housing 28 although the connector 10, housing wall 16, and aperture 14 therethrough referred to may be located elsewhere through the engine 18 as a convenience such as angularly through a sidewall 30 and top deck 32 of a cylinder or combustion chamber head 34 shown in phantom outline.

Referring more particularly to Fig. 1, a fluid supply tank 36 is connected in series to a fluid transfer line 38, a conventional fluid-metering pump 40, the outer line 20, the inner line 22, and a conventional fluid injection nozzle 42. The fluid injection nozzle 42 is conventionally mounted within the cylinder head 34 and communicates with a combustion chamber 44 defined within an engine block 46 also shown in phantom outline. The inner fluid line 22 and a conventional valve-rocker-arm assembly (not shown) are enclosed by the valve-rocker-arm housing 28, which is shown partially in cross section and partially in phantom outline, and a housing cover 48 which is removably fastened to the housing 28 by a plurality of bolts 50.

The bulkhead-fluid-line connector 10 comprises an enlarged end portion 52 integrally formed on the outer line 20; another enlarged end portion 54

integrally formed on the inner line 22, the end portions 52, 54 being sealably mateably complementarity; and means 56 for releasably coupling the fluid line end portions 52, 54 in direct surface-to-surface sealable contact. Preferably, the releasable coupling means 56 is adapted to extend through the housing wall aperture 14 and to be releasably clamped against the outside and inside housing wall surfaces 24, 26.

Referring to Fig. 2, the releasable coupling means 56 includes an elongated fitting 58 slideably positioned and extending through the housing wall aperture 14, first and second collars or washers 60, 62, a first retainer such as an internally-threaded nut 64 releasably clamping the fitting 58 against the outside and inside housing wall surfaces 24, 25, and a second retainer such as an internally-threaded cap nut 66 releasably coupling the mateably complementary end portions 52, 54 of the outer and inner fluid lines 20, 22 in direct surface-to-surface sealable contact.

The exterior of the fitting 58 preferably has an enlarged hexagonally shaped head-end portion 68, which is of a larger diameter than that of the housing wall aperture 14 and defines an external annular shoulder 70; another or externally threaded end portion 72, and an intermediate annular guide portion 74 which slideably fits in the housing wall aperture 14. The interior of the fitting 58 defines a stepped longitudinal bore 77, through which the fluid line assembly 12 passes, having an internal annular shoulder 78. The external shoulder 70 of the fitting 58 abuts one of the inside or outside surfaces 26, 24 of the housing wall 16 and the first retainer 64 releasably and threadably connects to the externally threaded portion 72 of the fitting 58 and abuts the other of the inside or outside surfaces 26, 24 of the housing wall 16 thereby releasably securing the fitting 58 to the housing wall 16 and merely subjecting the wall to a harmless compressive stress state. In the preferred embodiment, the fitting 58 is oriented so that the fitting shoulder 70 abuts the inside housing wall surface 26. Furthermore, the inside surface 26 of the housing wall 16 is preferably provided with an integral outwardly projecting rib or lug 75 having a flat face 76. The rib 75 is oriented, for example, horizontally or, alternatively, vertically so that one of the flat sides of the hexagonal head-end portion 68 of the fitting 58 can slidably and radially abut the rib flat face 76 thereby preventing rotation of the fitting 58 within the housing wall aperture 14 as the first or second retainers 64, 66 are fastened to or loosened from the fitting 58. An annular fluid seal 79 is positioned snugly on the fitting 58 between the first retainer 64 and the fitting guide portion 74. The second retainer 66 is thereafter also releasably and threadably connected to the threaded end portion 72 of the fitting 58.

Preferably, the enlarged end portion 52 of the outer line 20 is cold formed by a tube swaging operation and has an annular shoulder 80 and an external end surface 82 which is frusto-conically shaped to an included angle of about 60°.

Similarly, the another enlarged end portion 54 of the second line 22 is cold formed by a tube swaging operation and has an external annular frusto-conical shoulder 84 and a frusto-conical internal end surface 86 which is sealably, mateably complementarity with respect to the end surface 82 of the outer line 20.

Preferably prior to the tube swaging operation, the first and second collars 60, 62 are slideably positioned adjacent the nonenlarged end portions 52, 54 of the respective outer and inner fluid lines 20, 22 so that the collars 60, 62 become pressed onto the respective lines 20, 22 by an interference fit during the tube swaging operation. As shown in Fig. 1, the inner line 22 is similarly provided with a third collar or washer 88 and a slideable third retainer or cap nut 90 before the inner line is swaged at its opposite end portion. Furthermore, the releasable coupling means 56 preferably includes at least one fluid leakage path 92 extending adjacent the joint of the contacting fluid line end surfaces 82, 86 and leading to the outside of the second retainer 66. The fluid leakage path 92 includes a cavity 94, defined by the inside of the second retainer 66 and one or more angularly drilled passages 96 located in the first collar 60. Two parallel and spaced apart passages 96 are preferably provided as shown to ensure that one of the passages 96 will always communicate with the cavity 94 regardless of which side of the first collar 60 abuts the annular shoulder 80 of the first line 20 during assembly. Another annular fluid seal 98 is positioned in a radially peripheral annular groove 100 of the second collar 62. The two annular seals 79, 98 tightly seal the fluid leakage path 92 from the inside surface 26 of the housing wall 14 and, consequently in the embodiments illustrated, seal the fluid leakage path 92 from the inside of the valve-rocker-arm housing 28.

Fig. 3 illustrates an alternative embodiment of the present invention which basically differs from that shown in Figs. 1 and 2 in that the internal shoulder 78' of the fitting bore 77' is positioned closer to the head-end portion 68 of the fitting 58'. The releasable coupling means 56' further includes an elongated sleeve 102 positioned concentrically, between the first line 20 and the fitting 56', and transversely slideably positioned between the first collar 60 and the second retainer 66. A first annular clearance 104 is provided concentrically between the sleeve 102 and the fitting 58' and a second annular clearance 106 is provided between the sleeve 102 and the first line 20. The releasable coupling means 56' shown in Fig. 3 effectively shortens the required overall length of the inner line 22 in order to facilitate easier installation and removal of the inner line within the housing 28. In Fig. 3 instead of providing the passage or passages 96 in the first collar 60, alternatively, the sleeve 102 may, for example, be provided with a cross hole 108 drilled through its middle portion or a notch (not shown) at either end of the sleeve 102.

Industrial Applicability

While the assembly and operation of the present invention is believed clearly apparent from the foregoing description, further amplification will be made in the following brief summary of such assembly and operation.

To assemble the fluid line assembly 12 through the housing wall 16, an unbent and nonswaged inner line 22 is slideably passed through the second collar 62 and bore 77 of the fitting 58. With the fitting 58 temporarily slideably positioned out of the way, the second collar 62 is slideably positioned adjacent the end portion 54 of the inner line 22 and then the end portion 54 is enlarged by swaging to form the internal frusto-conical surface 86, external shoulder 84, and an interference fit between the second collar 62 and the inner line 22. The opposite end portion of the inner line 22 may at the same time be provided with the third retainer 90, which is temporarily remotely slideably spaced while the opposite end portion is swaged, and the third collar 88 which is press-fitted thereon. The second line may then be bent to a preselected shape in order to fit within the housing 28 and connect between the releasable coupling means 56 and the fluid injection nozzle 42.

The annular seal 98 is positioned in the groove 100 of the second collar 62 and the second collar 62 is then snugly positioned in the fitting bore 77 against the internal shoulder 78 of the fitting 58.

With the housing cover 48 removed from the housing 28, the inner line 22 and the components 58, 62, 88, 90, 98 assembled to or trapped on it are positioned in the housing 28 and the fitting 58 is slideably positioned through the housing wall aperture 14 until one of the sides of the hexagonal head-end portion 68 radially abuts the flat face 76 of the housing wall rib 75, the external shoulder 70 abuts the inside surface 26 of the housing wall 16, and the externally threaded portion 72 of the fitting 58 projects outwardly from the outside surface 24 of the housing wall 16. The annular seal 79 is then positioned on the exterior of the fitting 58 between the threaded end portion 72 and the guide portion 74. The first retainer 64 is then loosely threadably fastened to the fitting threaded end portion 72. The third retainer 90 is then threadably fastened to the fuel injection nozzle 42. At this point the first retainer 64 may be threadably tightened thereby clamping the fitting 58 against the outside and inside housing wall surfaces 24, 26 and subjecting the housing wall 16 to a harmless compressive stress state between the first retainer 64 and the head-end portion 68 of the fitting 58. This ensures that the fluid line assembly 12 may be supported and secured to a low frequency vibrating structure such as the valve-rocker-arm housing 28 without adversely stressing or cracking the housing. The outer line 20 is then positioned so that the end surfaces 82, 86 are in direct sealable mating contact and the second retainer 66 is threadably tightened onto the threaded end portion 72 of the fitting 58 so that the end surfaces 82, 86 seal against each other.

The bulkhead-fluid-line connector 10 having a single fluid path joint is relatively easier and less time consuming to assemble and service as compared with adapters having multiple fluid path joints and thereby minimizes the number of potential sources of high pressure fuel leakage due to improper assembly.

In operation a fluid, such as fuel, is delivered from the fluid supply tank 36, through the fluid transfer line 38, and then through pump 40 where the fluid is periodically metered and delivered under high pressure through outer line 20, through inner line 22, through fluid injection nozzle 42 and sprayed into the engine combustion chamber 44.

In the event that the second retainer 66 is not properly tightened, high pressure fluid leaking between the end surfaces 82, 86 of the single fluid path connection will be prevented by the seals 79, 98 from entering the housing 28 and contaminating or diluting a lubricating fluid which is normally circulated therein. In Fig. 2 any fluid leakage may flow into the second retainer cavity 94 and out to the exterior of the second retainer 66 via either one of the angularly drilled passages 96 in the first collar 60 or along the threaded end portion 72 of the fitting 58. In Fig. 3, any fluid leakage will flow out to the exterior of the second retainer 66 either via one of the collar passages 96 and second annular clearance 106 or along the first annular clearance 104 and past the threaded end portion 72 of the fitting 58'.

Claims

1. A bulkhead-fluid-line connector (10) for joining and supporting a tubular fluid line assembly (12) adapted for passing through an aperture (14) of a housing wall (16), said housing wall (16) having outside and inside surfaces (24, 26), said fluid line assembly (12) including first and second fluid lines (20, 22), said bulkhead-fluid-line connector (10) comprising:

an enlarged end portion (52) integrally formed on the first line (20) and having frusto-conically shaped end surface (82);

another enlarged end portion (54) integrally formed on the second line (22) and having an internally disposed and frusto-conically shaped end surface (86); and

means (56) for releasably coupling said end surfaces (82, 86) of the fluid line end portions (52, 54) creating a joint between the first and second fluid lines (20, 22) generally where the fluid line assembly (12) is adapted to pass through the housing wall aperture (14), said releasable coupling means (56) including a fitting (58), first and second retainers (64, 66) and a first collar (60) positioned between the first fluid line end portion (52) and the second retainer (66), said fitting (58) adapted to slidably extend through the housing wall aperture (14) and defining a longitudinal bore (77) through which the fluid line assembly (12) passes, said fitting (58) having an enlarged head-end portion (68) defining an external shoulder

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While the assembly and operation of the present invention is believed clearly apparent from the foregoing description, further amplification will be made in the following brief summary of such assembly and operation.

To assemble the fluid line assembly 12 through the housing wall 16, an unbent and nonswaged inner line 22 is slideably passed through the second collar 62 and bore 77 of the fitting 58. With the fitting 58 temporarily slideably positioned out of the way, the second collar 62 is slideably positioned adjacent the end portion 54 of the inner line 22 and then the end portion 54 is enlarged by swaging to form the internal frusto-conical surface 86, external shoulder 84, and an interference fit between the second collar 62 and the inner line 22. The opposite end portion of the inner line 22 may at the same time be provided with the third retainer 90, which is temporarily remotely slideably spaced while the opposite end portion is swaged, and the third collar 88 which is press-fitted thereon. The second line may then be bent to a preselected shape in order to fit within the housing 28 and connect between the releasable coupling means 56 and the fluid injection nozzle 42.

The annular seal 98 is positioned in the groove 100 of the second collar 62 and the second collar 62 is then snugly positioned in the fitting bore 77 against the internal shoulder 78 of the fitting 58.

With the housing cover 48 removed from the housing 28, the inner line 22 and the components 58, 62, 88, 90, 98 assembled to or trapped on it are positioned in the housing 28 and the fitting 58 is slideably positioned through the housing wall aperture 14 until one of the sides of the hexagonal head-end portion 68 radially abuts the flat face 76 of the housing wall rib 75, the external shoulder 70 abuts the inside surface 26 of the housing wall 16, and the externally threaded portion 72 of the fitting 58 projects outwardly from the outside surface 24 of the housing wall 16. The annular seal 79 is then positioned on the exterior of the fitting 58 between the threaded end portion 72 and the guide portion 74. The first retainer 64 is then loosely threadably fastened to the fitting threaded end portion 72. The third retainer 90 is then threadably fastened to the fuel injection nozzle 42. At this point the first retainer 64 may be threadably tightened thereby clamping the fitting 58 against the outside and inside housing wall surfaces 24, 26 and subjecting the housing wall 16 to a harmless compressive stress state between the first retainer 64 and the head-end portion 68 of the fitting 58. This ensures that the fluid line assembly 12 may be supported and secured to a low frequency vibrating structure such as the valve-rocker-arm housing 28 without adversely stressing or cracking the housing. The outer line 20 is then positioned so that the end surfaces 82, 86 are in direct sealable mating contact and the second retainer 66 is threadably tightened onto the threaded end portion 72 of the fitting 58 so that the end surfaces 82, 86 seal against each other.

The bulkhead-fluid-line connector 10 having a single fluid path joint is relatively easier and less time consuming to assemble and service as compared with adapters having multiple fluid path joints and thereby minimizes the number of potential sources of high pressure fuel leakage due to improper assembly.

In operation a fluid, such as fuel, is delivered from the fluid supply tank 36, through the fluid transfer line 38, and then through pump 40 where the fluid is periodically metered and delivered under high pressure through outer line 20, through inner line 22, through fluid injection nozzle 42 and sprayed into the engine combustion chamber 44.

In the event that the second retainer 66 is not properly tightened, high pressure fluid leaking between the end surfaces 82, 86 of the single fluid path connection will be prevented by the seals 79, 98 from entering the housing 28 and contaminating or diluting a lubricating fluid which is normally circulated therein. In Fig. 2 any fluid leakage may flow into the second retainer cavity 94 and out to the exterior of the second retainer 66 via either one of the angularly drilled passages 96 in the first collar 60 or along the threaded end portion 72 of the fitting 58. In Fig. 3, any fluid leakage will flow out to the exterior of the second retainer 66 either via one of the collar passages 96 and second annular clearance 106 or along the first annular clearance 104 and past the threaded end portion 72 of the fitting 58'.

Claims

1. A bulkhead-fluid-line connector (10) for joining and supporting a tubular fluid line assembly (12) adapted for passing through an aperture (14) of a housing wall (16), said housing wall (16) having outside and inside surfaces (24, 26), said fluid line assembly (12) including first and second fluid lines (20, 22), said bulkhead-fluid-line connector (10) comprising:
 - an enlarged end portion (52) integrally formed on the first line (20) and having frusto-conically shaped end surface (82);
 - another enlarged end portion (54) integrally formed on the second line (22) and having an internally disposed and frusto-conically shaped end surface (86); and
 - means (56) for releasably coupling said end surfaces (82, 86) of the fluid line end portions (52, 54) creating a joint between the first and second fluid lines (20, 22) generally where the fluid line assembly (12) is adapted to pass through the housing wall aperture (14), said releasable coupling means (56) including a fitting (58), first and second retainers (64, 66) and a first collar (60) positioned between the first fluid line end portion (52) and the second retainer (66), said fitting (58) adapted to slidably extend through the housing wall aperture (14) and defining a longitudinal bore (77) through which the fluid line assembly (12) passes, said fitting (58) having an enlarged head-end portion (68) defining an external shoulder



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(70) and another end portion (72), said fitting shoulder (70) adapted to abut one of the inside or outside housing wall surfaces (26, 24), said first retainer (64) releasably connected to said another end portion (72) of the fitting (58) and adapted to abut the other of the inside or outside housing wall surfaces (26, 24), said second retainer (66) also releasably connected to the another end portion (72) of the fitting (58) and releasably coupling the end surfaces (82, 86) of the fluid line end portions (52, 54),

characterized in that said frusto-conically shaped end surface (82) of said enlarged end portion (52) of the first line (20) is externally disposed and is sealingly mated complementarily with respect to said frusto-conically shaped end surface (86) of the second line (22) in direct surface-to-surface sealed contact whereby said joint is a single fluid path joint,

and in that said fitting bore (77) is stepped, a second collar (62) being sealedly positioned in the fitting bore (77) against an internal shoulder (78) of the fitting (58) and abutting the second line another end portion (54).

2. The bulkhead-fluid-line connector (10) as in claim 1, wherein said releasable coupling means (56) further includes a fluid leakage path (92) extending adjacent the single joint of the sealedly contacting fluid line end surfaces (82, 86) and adapted to be sealed from the inside surface (26) of the housing wall (16) and further adapted to lead only to the outside of the housing wall (16).

3. The bulkhead-fluid-line connector (10) as in claim 2, wherein said fluid leakage path (92) includes a cavity (94), defined by the inside of the second retainer (66), and at least one passage (96) located in the first collar (60) which communicates the cavity (94) with the external surface of the second retainer (66).

Patentansprüche

1. Verbindungsstück (10) einer Fluidleitung zur Verbindung und zur Halterung einer rohrförmigen Fluidleitungsanordnung (12), geeignet zur Hindurchführung durch eine Öffnung (14) einer Gehäusewand 16, wobei die Gehäusewand (16) Außen- und Innenoberflächen (24, 26) aufweist und die Fluidleitungsanordnung (12) erste und zweite Fluidleitungen (20, 22) besitzt und das Verbindungsstück (10) folgendes aufweist:

einen vergrößerten Endteil (52) integral ausgebildet an der ersten Leitung (20) und mit einer kegelstumpfförmigen Endoberfläche (82);

ein weiteres vergrößertes Endteil (54) integral ausgebildet an der zweiten Leitung (22) und mit einer intern angeordneten und kegelstumpfförmig ausgebildeten Endoberfläche (86), und Mittel (56) zur lösbaren Kupplung der Endoberflächen (82, 86) der Fluidleitungsendteile (52, 54) zur Schaffung einer Verbindung zwischen den ersten und zweiten Fluidleitungen (20, 22), im allgemeinen wo die Fluidleitungsanordnung (12) durch die Gehäusewandöffnung (14) läuft, wobei die lösbaren Kupplungsmittel (56) ein Fitting (58),

erste und zweite Halter (64, 66) und einen ersten Kragen (60) aufweisen, und zwar positioniert zwischen dem ersten Fluidleitungsendteil (52) und dem zweiten Halter (66), wobei das Fitting (58) geeignet ist, zur gleitenden Erstreckung durch die Gehäusewandöffnung (14) und eine Längsbohrung (77) definiert, durch welche die Fluidleitungsanordnung (12) läuft, wobei das Fitting (58) einen vergrößerten Kopfendteil (68) aufweist und eine externe Schulter (70) und einen weiteren Endteil (72) definiert, wobei die Fitting-schulter (70) dazu geeignet ist, an einer der Innen- oder Außengehäusewandoberflächen (26, 24) anzustoßen, wobei der erste Halter (64) lösbar mit dem anderen Endteil (72) des Fitting (58) in Verbindung steht und an der anderen Oberfläche der Innen- und Außengehäusewandoberflächen (26, 24) anstößt, wobei schließlich der zweite Halter (66) auch lösbar mit dem anderen Endteil (72) des Fitting (58) verbunden ist und in lösbarer Weise die Endoberflächen (82, 86) der Fluidleitungsendteile (52, 54) kuppelt, dadurch gekennzeichnet, daß die kegelstumpfförmig geformte Endoberfläche (82) des vergrößerten Endteils (52) der ersten Leitung (20) extern angeordnet ist und in abdichtender Weise zusammenpaßt, und zwar komplementär bezüglich der kegelstumpfförmigen Endoberfläche (86) der zweiten Leitung (22) in direktem abgedichteten Oberflächen-zu-Oberflächenkontakt, wodurch die Verbindung eine einzige Fluidbahnverbindung ist, und ferner dadurch gekennzeichnet, daß die Fittingbohrung (77) abgestuft ist, wobei ein zweiter Kragen (62) abdichtend in der Fittingbohrung (77) an der Innenschulter (78) des Fitting (58) angeordnet ist und an dem anderen Endteil (54) der zweiten Leitung anstößt.

2. Verbindungsstück (10) für eine Fluidleitung nach Anspruch 1, wobei die lösbaren Kupplungsmittel (56) ferner einen Fluidleckpfad (92) aufweisen, der sich benachbart zu der einzigen Verbindung der sich abdichtend berührenden Fluidleitungsendoberflächen (82, 86) angeordnet ist und geeignet ist, von der Innenoberfläche (26) der Gehäusewand (16) abgedichtet zu sein und ferner geeignet dazu, nur zu der Außenseite der Gehäusewand (16) zu leiten.

3. Verbindungsstück (10) für eine Fluidleitung nach Anspruch 2, wobei der Fluidleckpfad (92) einen Hohlraum (94) definiert durch die Innenseite des zweiten Halters (66) aufweist und mindestens einen Durchlaß (96) angeordnet im ersten Kragen (60), und zwar zur Verbindung des Hohlraums (94) mit der Außenoberfläche des zweiten Halters (66).

Revendications

1. Raccord (10) de canalisations de fluide au niveau d'une cloison, servant à relier et à supporter un ensemble (12) de canalisations tubulaires de fluide adapté pour traverser une ouverture (14) d'une paroi (16) d'un carter, ladite paroi (16) du carter comportant des surfaces extérieure et intérieure (24, 26), ledit ensemble (12) de canalisations



tions de fluide comprenant des première et seconde canalisations de fluide (20, 22), ledit raccord (10) de canalisations de fluide au niveau d'une cloison comprenant:

- une partie d'extrémité élargie (52) formée d'un seul tenant sur la première canalisation (20) et comportant une surface d'extrémité de forme tronconique (82);
- une autre partie d'extrémité élargie (54) formée d'un seul tenant sur la seconde canalisation (22) et comportant une surface d'extrémité (86) prévue intérieurement et possédant une forme tronconique; et
- des moyens (56) pour accoupler, d'une manière détachable, lesdites surfaces d'extrémité (82, 86) des parties d'extrémité (52, 54) des canalisations de fluide, établissant un raccordement entre les première et seconde canalisations de fluide (20, 22), d'une manière générale à l'endroit où l'ensemble (12) des canalisations de fluide est adapté pour traverser l'ouverture (14) de la paroi du carter, lesdits moyens d'accouplement détachables (56) comprenant un organe de raccordement (58), des premier et second organes de retenue (64, 66) et un premier collier (60) disposé entre la partie d'extrémité (52) de la première canalisation de fluide et le second organe de retenue (66), ledit organe de raccordement (58) étant adapté pour s'étendre avec possibilité de glissement à travers l'ouverture (14) de la paroi du carter, et définissant un perçage longitudinal (77) que traverse l'ensemble (12) des canalisations de fluide, ledit organe de raccordement (58) comportant une partie d'extrémité de tête élargie (68) définissant un épaulement extérieur (70) et une autre partie d'extrémité (72), ledit épaulement (70) de l'organe de raccordement étant adapté pour venir en butée contre l'une des surfaces intérieure ou extérieure (26, 24) de la paroi du carter, ledit premier organe de retenue (64) étant raccordé de façon détachable à ladite autre partie d'extrémité (72) de l'organe de raccordement (58) et étant adapté pour venir en butée contre l'autre des surfaces intérieure et extérieure

(26, 24) de la paroi du carter, ledit second organe de retenue (66) étant également raccordé de façon détachable à l'autre partie d'extrémité (72) de l'organe de raccordement (58) et accouplant d'une manière détachable les surfaces d'extrémité (82, 86) des parties d'extrémité (52, 54) des canalisations de fluide,

caractérisé en ce que ladite surface d'extrémité de forme tronconique (82) de ladite partie d'extrémité élargie (52) de la première canalisation (20) est disposée extérieurement et est accouplée de façon étanche, d'une manière complémentaire à ladite surface d'extrémité de forme tronconique (86) de la seconde canalisation (22) en établissant un contact étanche surface contre surface, ce qui a pour effet que ledit raccordement est un raccordement unique du trajet de fluide, et

en ce que ledit perçage (77) de l'organe d'accouplement est étagé, un second collier (62) étant positionné d'une manière étanche dans le perçage (77) de l'organe de raccordement (58), contre un épaulement intérieur (78) de l'organe de raccordement (58) et en butée contre l'autre partie d'extrémité (54) de la seconde canalisation.

2. Raccord (10) de canalisations de fluide au niveau d'une cloison selon la revendication 1, dans lequel lesdits moyens d'accouplement détachables (56) comprennent en outre un trajet de fuite de fluide (92) s'étendant au voisinage du raccordement unique des surfaces d'extrémité (82, 86) des canalisations de fluide qui sont en contact étanche, adapté pour être étanchéifié vis à vis de la surface intérieure (26) de la paroi (16) du carter, et adapté en outre pour déboucher uniquement à l'extérieur de la paroi (16) du carter.

3. Raccord (10) de canalisations de fluide au niveau d'une cloison selon la revendication 2, dans lequel ledit trajet de fuite de fluide (92) comprend une cavité (94) définie par l'espace intérieur du second organe de retenue (66), et au moins un passage (96) situé dans le premier collier (60) et qui met en communication la cavité (94) avec la surface extérieure du second organe de retenue (66).

