sensor must be carried by the electrically conductive layer of the hose through a fluid fitting or connector to a device where it is made available for use by other control or diagnostic systems. The hose cutting clip is shown as having two sharp end tabs that extend from the clip body. This hose cutting clip provides a knife like cutting function as the hose is fully installed onto the fluid connector. The inner layer of the hose is cut by at least one of the end tabs so that there is an electrical path formed from the electrically conductive layer of the hose to the fluid connector via the cutting clip. In other words, the electrical signal can then be routed through the fluid connector to the device it is attached to or, if the connector is insulated, the signal can be directly routed to an electronic circuit such as a diagnostic or control system. The hose cutting clip of this disclosure is particularly suitable for use in a hose that incorporates some type of sensing element in the hose which generates a signal that must be carried by the conductive layer of the hose through the fluid connector to a device where it is made available for use to monitor hose life or system pressures by other control or diagnostic systems. The conductive layer of the hose is usually a steel braid, spiral wound or knitted layer although other conductive materials could be used equally as well following the teachings of this disclosure.

[0004] Also disclosed is another embodiment where a connector socket has cutting tabs extending inwardly which is used with hoses having a second conductive layer and an intermediate non-conductive layer that separates the first conductive layer from the second conductive layer. The cutting tabs cut into the outer layer of the hose and penetrate down to touch and slightly deform the second conductive layer. This completes the electrically conductive path from the second conductive layer to the socket. The socket is electrically insulated from the connector body by an insulating collar. In the case where higher fluid pressures need to be handled by the fluid connector and attached hose, then a crimped socket can be used to apply additional clamping force on the outside of the hose over a hose nipple.

[0004a] According to a first aspect, there is provided a fluid connector that includes a cutting clip thereon, the cutting clip having at least one cutting end and attached to a body section of the fluid connector, where the fluid connector extends along a central axis, and where the at least one cutting end of the cutting clip extends in a direction of the central axis so as to cut at least an inner layer of an installed hose, the at least one cutting end contacting a conductive layer of the hose.

[0004b] According to a second aspect, there is provided a method of providing electrical connection between a hose conductive layer and a fluid connector comprising: providing a cutting clip having a cutting end tab that extends in a direction of a central axis of the connector; attaching said cutting clip to said connector; providing a hose having an inner layer and a conductive layer; installing said hose on said connector such that said cutting end tab cuts into said hose inner layer and along the central axis of the connector and makes electrical contact with said conductive layer of said hose.

[0004c] According to a third aspect, there is provided a method of providing electrical connection between a hose conductive layer and a fluid coupling body comprising; providing a cutting clip having a cutting end that extends along a central axis of a hose; attaching said cutting clip to said coupling body; providing a hose having an inner layer and a first conductive layer and an intermediate layer and a second conductive layer and an outer layer; installing said hose on said fluid coupling such that said cutting end cuts into said hose inner layer along the central axis and makes electrical contact with said first conductive layer of said hose; providing a hose socket mounted on said coupling body, said hose socket having socket cutting tabs extending inwardly therefrom; and crimping said hose socket to said hose thereby causing said cutting tabs to penetrate said hose outer layer and extending to make electrical contact with said second conductive layer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. 1 is a cross-sectional view of the exemplary cutting clip mounted to a fluid connector;

[0006] FIG. 2 is a perspective view of the exemplary cutting clip;

[0007] FIG. 3 is a perspective view of the exemplary cutting clip of FIG.1;

[0008] FIG. 4 is a cross-sectional view of a hose about to be installed on the fluid connector of FIG. 3; and