The Pioneer Large Scale Deflection Rotary Spear is the latest design to be added to Pioneer’s armoury of solutions for single trip casing recovery. Based on Pioneer’s successful STR Single Trip Recovery Spear, this tool maintains the feature set of the STR while increasing the range of catch sizes possible for each grapple through our large scale deflection technology. Unlike conventional spear design, this also allows the tool to negotiate in-bore restrictions without undue stress.

The LSD Rotary Spear, as can be seen from the diagram, has a non-rotating grapple sub-assembly that incorporates durable bronze bearings; this allows the mandrel to rotate relatively freely. Grapple control is achieved through the use of three features. Firstly, the tool uses an industry-standard J latch mechanism to lock or unlock the grapple between the running position and the catch position. Secondly, the arm springs energise the arms keeping them in contact with the casing wall at all times. Thirdly, when in the catch position the grapple sub-assembly uses a conical slip grapple-expansion mechanism that uses over-pull to energise the hardened grapple wickers into the casing wall.

It is in the spring loaded pivoting arms that this tool completely surpasses the conventional. As the arms are pivoting they avoid much of the stresses of grapples that use a rigid petal construction to maintain contact with the casing wall. As might be imagined, this has a positive effect of grapple longevity. More importantly however, the arms can pivot to a greater degree without being exposed to the high stress levels incurred by conventional grapples. This allows for a wider catch range for the tool as well as allowing it to negotiate in-bore restrictions that would be un-navigable to conventional grapples. This is especially apparent in the largest catch configuration of the LSD rotary spear which is for 30” casing; in this case the tool could navigate restrictions as small as 25.625”! The catch range for this tool is from 18.625” right up to 30” casing (with correct segments fitted).