S10 DiamondBack™ Reamer Shoe

Weatherford's S10 *DiamondBack* reamer shoe system enables operators to guide casing or liners to total depth (TD). It uses an eccentric guide nose to negotiate ledges and other wellbore obstructions while its integrated cutting structures simultaneously ream out tight spots. Highly versatile, the S10 reamer shoe is compatible with casing and liners of all sizes, including those with large diameters, and with the full spectrum of casing- and liner-hanger assemblies.

A streamlined version of Weatherford's standard *DiamondBack* reamer shoe system, the S10 model is ideally suited for budget-constrained operations. Several features reduce its manufacturing cost—a savings which is passed to end users—making it a more economical alternative to conventional reamer shoe systems. Such features include the absence of a joint upset and stabilizer gauge, shorter shell length, and an optimized cutting structure. While these modifications have reduced the cost of the system, it remains well equipped to mitigate any difficulties, anticipated or unanticipated, occurring while running casing or liners.

Applications

- Guiding casing or liners to TD by reaming out tight spots, climbing ledges, and negotiating wellbore obstructions through rotation or reciprocation of the pipe
- Guiding large-diameter casing or liners to TD when little or no rotation is possible

Features, Advantages and Benefits

- The eccentric guide nose offers several advantages:
  - Capable of climbing ledges and negotiating other wellbore obstructions quickly and easily, the guide nose enables operators to overcome otherwise impassable obstacles, thereby facilitating running of casing or liners to TD.
  - Made from aluminum, the guide nose is designed to withstand impact loading and high set-down weight during reaming, which reduces wear and tear and minimizes the risk of damage.
- The carbide cutting structures optimize rotation and reciprocation, which enhances cutting efficiency and helps clear a path for the casing or liners.

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Features, Advantages and Benefits *(continued)*

- Rigid standoff stabilizer blades improve casing standoff, keeping the pipe off the low side of the wellbore; as such, they help clear a path for the casing or liners and most rigid centralizers, enhancing operational efficiency.
- Large flow-directed ports prevent channeling—the occurrence of faults in the cementing, which weaken the bond between the casing or liner and the formation—thereby improving well construction.
- The system's Sure-Seal 3™ float valve also helps improve well construction by preventing the backflow of cement into the casing or liner, which can lead to poor zonal isolation.
- Several features reduce the cost to manufacture the S10 *DiamondBack* system—a savings which is passed to end users—making it a more economical alternative to its conventional counterparts.
  - The system is designed to function without a joint upset or stabilizer gauge, reducing the number of required parts.
  - It requires less overall material, because of its shorter shell length.
  - It uses fewer diamonds in its cutting structure.
  - It has a lower overall material yield strength.
- Reduced head content through the use of bored vertical holes makes the system unique because there is less material to drill out on the rig.

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Specifications

Model Number[a]	Casing Size[b] (in./*mm*)	Tool OD (in./*mm*)	Length (in./*mm*)	API Casing Weight Range (lb/ft, *kg/m*)	API Casing Drift Range (in./*mm*)	Number of Gauge Blades	Number of Cutting Pads	Valve Inlet Flow Area (in.²/*mm²*)	Nose Port Flow Area (in.²/*mm²*)	Backpressure Rating, Valve Only (psi/*MPa*)	Material Specification
RD044056CV-S10	4-1/2 *114.30*	5-3/4 *146.05*	22.402 *569.0*	11.6 to 15.1 *17.3 to 22.5*	3.875 to 3.701 *98.43 to 94.01*	3	6	3.14 *2,027*	3.29 *2,121*	10,000 *68.95*	AISI 4145
RD070082CV-S10	7 *177.80*	8-1/4 *209.55*	27.835 *707.0*	20.0 to 38.0 *29.8 to 56.6*	6.331 to 5.795 *160.81 to 147.19*	6	12	4.91 *3,168*	5.84 *3,770*	10,000 *68.95*	AISI 4145
RD095120CV-S10	9-5/8 *244.48*	12 *304.80*	35.079 *891.0*	40.0 to 53.5 *59.6 to 79.7*	8.750 to 8.500 *222.25 to 215.90*	6	12	4.91 *3,168*	5.84 *3,770*	10,000 *68.95*	ST 52
RD133144CV-S10	13-3/8 *339.73*	14-1/2 *368.30*	40.354 *1,025.0*	68.0 to 72.0 *101.3 to 107.3*	12.259 to 12.250 *311.38 to 311.15*	6	12	4.91 *3,168*	13.15 *8,482*	10,000 *68.95*	ST 52
RD133146CV-S10		14-3/4 *374.65*									
RD133154C-S10 RD133154CV-S10 RD133154CV-S10A[c]		15-1/2 *393.70*									
RD133161CV-S10		16-1/8 *409.58*									
RD133170V-S10		17 *431.80*									
RD140152CV-S10	14[d] *355.60*	15-1/4 *387.35*	40.354 *1,025.0*	120.0 *178.8*	12.230 *310.67*	6	12	4.91 *3,168*	13.15 *8,482*	10,000 *68.95*	ST 52

[a]Nomenclature:
C = carbide cutting structure
CV = carbide cutting structure with single valve
CVV = carbide cutting structure with double valve

[b]Other sizes are available for development on request. Contact your Weatherford representative for details.

[c]Special nose assembly on field trial

[d]Specific for 120-lb (54.4-kg) VAM® TOP® SC80 and 0.825-in. Wall Hydril Mac-II