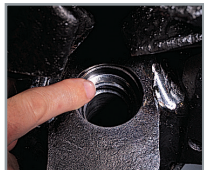


Roller Cone

# Nozzle Installation for Roller Cone Bits

For all HDBS Roller Cone Bits

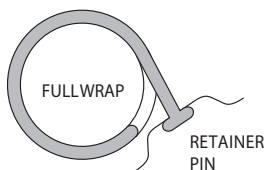
**1** Clean out any grease and dirt from the nozzle and nozzle bore, after removing the nozzle bore protectors.



HAL12348

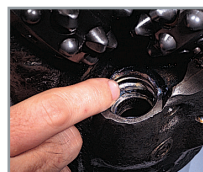
**2** Check the O-ring in the nozzle bore which should be seated in a groove below the groove for the pin lock. Feel and look for any foreign objects, making sure the O-ring is in place all around, and that it's not damaged.

**3** Replace the O-ring if necessary. Feel for any foreign objects in the O-ring groove. The proper size O-ring should fit snugly on the OD of the nozzle. Using fingers only, insert the O-ring into its groove, ensuring that it isn't mistakenly placed in the pin groove (figure 1 below).



HAL12350

**4** Inspect the nozzle for any sharp edges which could cut the O-ring.



HAL12351



HAL12352

**5** Grease the bit nozzle OD and the nozzle bore to ensure it will slide past the O-ring. You can use grease from the nozzle bore protectors as long as it contains no debris that could damage the O-ring.



HAL12354

**6** Insert the nozzle, using thumbs, by pressing the nozzle firmly into the bore, working it slightly until it slides past the O-ring and seats on the shoulder of the nozzle bore. If it's extremely hard to start, check for foreign matter between the O-ring and the O-ring groove. Never hammer the nozzle into place. This can chip or crack the nozzle and damage the O-ring. Protective eye wear should be worn, since tungsten carbide nozzles can chip easily from any impact.



HAL12356

**7** Confirm that the retaining pin is the correct length, then insert the pin into the retaining pin hole. Tap it with a hammer until the head is flush with the bit body. A properly installed pin could be slightly loose fitting.

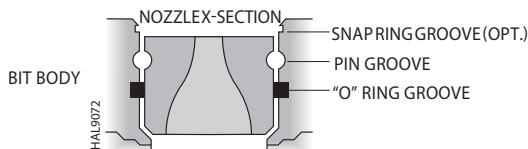


FIGURE 1

## Nail Lock Nozzles - XN, QH and XT Body Types

STANDARD NOZZLES	NOZZLE PART NO.	BIT SIZE IN.	RETAINER		NOZZLE ID SIZES IN 1/32 INCREMENTS																		
			NAIL	O-RING	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26	28	32	
<p>HAL9048</p>	75564	4-1/2 to 4-3/4	75570	32804			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	56209	5-5/8 to 6-3/4	56210	16801	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	81361	7-5/8 to 9	81304	16802			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	83244	9-1/2 to 12-1/4	81304	16803			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90021	13-1/4 to 28	90031	16804			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Notes: Please specify nozzle requirements when ordering bits. Use hammer No. 86118 for installation and removal of all nozzle-retaining pins. Use standard nozzle removal tool as required (No. 305399).																							
EXTENDED NOZZLES	NOZZLE PART NO.	BIT SIZE IN.	RETAINER		NOZZLE ID SIZES IN 1/32 INCREMENTS																		
			NAIL	O-RING	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26	28	32	
	301792	7-5/8 to 9	81304	16802			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	302447	9-1/2 to 12-1/4	81304	16803					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	311306	13-1/4 to 28	90031	16804																■	■	■	■

Center Circulation Jet for XN, QH and XT Body Types Only



HAL9047

Design: Jet nozzle specially installed in the center dome area of standard jet bits.

Application: Designed for soft formation drilling applications. Halliburton center circulation nozzle is available for 7-3/8 through 28 inch roller cone bits. The nozzle provides direct fluid flow in the dome and across the cutting area of the bit to reduce bit balling and increase the rate of penetration. When run with extended nozzles, center jets have been extremely successful in contributing to the rapid removal of cuttings.

BIT SIZE IN.	SLEEVE	CAP	O-RING	NOZZLE	COMPLETE KIT PN (3)	TOOL FOR NOZZLE ASSY.	TOOL FOR NOZZLE CAP ASSY. AVAILABLE
7-3/8 to 8-3/4	301978	301977	16799	29564	302414	302442	16552 Note 1
9-1/2 to 12-1/4	310751	310750	16803	310749	310759	310758	601502 Note 1
13-1/2 to 28	310752	310750	16803	310749	310760	310758	601502 Note 2

Note 1: Sizes available 8, 9, 10, 11, 12, 14, 16

Note 2: Sizes available 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 28

Nozzles are not included in kit and must be ordered separately.

Nozzle Installation and Removal Tools



HAL9049

PART NUMBER	DESCRIPTION	BIT SIZE IN.
86188	Nozzle Hammer	All
959875	Nozzle Gauge	All
305399-0	Nozzle Extractor	4-1/2 to 6-3/4
305399-1	Nozzle Extractor	7-7/8 to 28