



HDD FIXED-CUTTER REAMING TOOLING

PDC Reamer Operating Guide

A concise field workflow for engineering review, installation, circulation, bore enlargement, retrieval and post-run inspection.

Document scope Operating guide applicable to the ten supplied PDC reamer drawings. It does not replace the rig manual, site procedures or project engineering plan.

Model	Drawing	OD	Overall length	Connection	Nozzles
PDC Reamer 7-5-13D	D260318B-1	177.8 mm	389 mm	2-7/8 API REG BOX, both ends	7 x 8 mm (5 front + 2 back)
PDC Reamer 8-5-13	D260314B	203.2 mm	427.9 mm	2-7/8 API REG BOX, both ends	8 x 8 mm (5 front + 3 back)
PDC Reamer 9-5-13D	D260318B-2	228.6 mm	434.5 mm	2-7/8 API REG BOX, both ends	8 x 8 mm (5 front + 3 back)
PDC Reamer 10-5-13	D260314B-2	254 mm	455 mm	2-7/8 API REG BOX, both ends	8 x 8 mm (5 front + 3 back)
PDC Reamer 12-5-13D	D260314B-3	304.8 mm	495 mm	2-7/8 API REG BOX, both ends	8 x 8 mm (5 front + 3 back)
PDC Reamer 14-6-16D	D260314B-4	355.6 mm	914.9 mm	2-7/8 API REG BOX, both ends	12 x 8 mm (9 front + 3 back)
PDC Reamer 16-6-16D	D260314B-5	408 mm	940.9 mm	2-7/8 API REG BOX, both ends	12 x 8 mm (9 front + 3 back)
PDC Reamer 18-6-16D	D260318B-3	457.2 mm	964.9 mm	2-7/8 API REG BOX, both ends	12 x 8 mm (6 front + 6 back)
PDC Reamer 24-6-16D	D260819B-2	609.6 mm	1210 +/- 10 mm	4-1/2 IF BOX, both ends	15 x 10 mm (12 front + 3 back)
PDC Reamer 30-6-16D	D260820B-7	762 mm	1340 +/- 10 mm	4-1/2 IF BOX, both ends	24 x 14 mm (18 front + 6 back)

What the drawings verify

OD, overall length, connections, cutter references, nozzle arrangement and identified body features.

What the project must approve

Formation suitability, staging, rig compatibility, makeup procedure, operating limits and hydraulic plan.

Four-step document use

1 Identify	2 Match	3 Verify	4 Approve
Confirm model and drawing.	Compare the bore, rig and connection.	Inspect the delivered configuration.	Release only under the project plan.

Controlled-use notice: Verify the current drawing, delivered configuration and project approval before use. The supplied drawings do not state weight or universal torque, rotary speed, thrust, pullback, flow or pressure limits.



1. Plan and verify before mobilization

No universal settings

The drawings do not provide operating limits. Establish approved values for rotation, torque, pullback, thrust, flow and pressure for the actual reamer, formation, rig, fluid and bore plan.

Pre-job engineering review

- [] Confirm model, drawing number, OD, overall length and both connections.
- [] Review formation strength, abrasiveness, variability, cobbles/boulders and transitions.
- [] Confirm pilot condition, enlargement stages and the diameter ratio for each stage.
- [] Verify the drill string, swivel and mating connections are compatible and approved.
- [] Match nozzle count/diameter to pump capacity, fluid properties and return requirements.
- [] Define monitoring and stop criteria for torque, pullback, pressure, returns, vibration and advance rate.

Receipt and pre-installation inspection

- [] Identification agrees with the approved drawing and order.
- [] Cutters, blades, gauge protection and hardfacing are complete and undamaged.
- [] Nozzles are present, correct for the approved plan and unobstructed.
- [] Threads and shoulders are clean, protected and free of galling, corrosion or impact.
- [] Body and fluid passages show no visible crack, deformation, blockage or unauthorized repair.

2. Installation and startup

Installation sequence

Isolate and support	Stop the rig and fluid system, control stored energy, and support the reamer with rated equipment.
Clean interfaces	Clean mating threads and shoulders. Apply only the approved thread compound.
Align and engage	Align the components and engage slowly to avoid cross-threading or shoulder damage.
Make up	Use the approved procedure and model-specific makeup torque. Connection size alone is not a torque specification.
Verify direction and assembly	Confirm the reamer orientation, pullback arrangement, swivel/connection security and clearance.
Verify hydraulics	Confirm nozzle count and size, unobstructed passages and the approved circulation plan.

Controlled startup

- [] Clear personnel and confirm all guards, restraints and monitoring systems are active.
- [] Start circulation under the approved sequence and check for leakage or abnormal pressure.
- [] Begin rotation and movement at the approved low-energy startup condition.
- [] Establish smooth cutting before increasing inputs within the approved operating plan.
- [] Confirm stable returns and cuttings transport before continuing the pullback.

3. Reaming, monitoring and response

Monitor continuously

- Torque trend and any sudden increase or cyclic variation.
- Pullback load, advance rate and evidence of restricted movement.
- Fluid pressure, flow, returns and signs of losses or blockage.
- Vibration, impact, unusual sound and drill-string behavior.
- Formation transitions and changes in cuttings size or character.

Stop and investigate conditions

Observation	First checks	Required response
High pressure	Nozzle blockage, restricted passages, changed fluid	Stop under the approved procedure; isolate and inspect.
Torque or pullback spike	Formation change, pack-off, damaged cutter, alignment	Reduce energy and stop at the approved limit; do not force through.



Observation	First checks	Required response
Loss of returns	Formation loss zone, fluid loss, collapse or leakage	Follow the project loss-response plan and reassess before continuing.
Abnormal vibration	Uneven cutting, impact, missing/damaged cutter	Stop or retrieve when the approved criteria are reached.
Connection movement/leakage	Makeup, shoulder or thread condition	Stop; inspect and obtain release before reuse.

Formation transitions

When response changes, reduce energy and compare torque, pullback, pressure, returns and cuttings against the expected geology. A transition is a reason to reassess the tool-ground match, not to exceed approved limits.

4. Retrieval, inspection and records

- [] Stop rotation and pressure, isolate stored energy and support the assembly before disconnection.
- [] Clean the reamer without impacting PDC cutters or forcing debris into the connections.
- [] Inspect every blade, cutter row, gauge area, hardfacing, nozzle, fluid passage, body and connection.
- [] Compare wear around the full circumference; document uneven wear and affected locations.
- [] Record model, drawing, serial/batch identification, bore interval, formation, operating history and photographs.
- [] Protect both connections and store the reamer dry in a stable cradle.

Field-support information

Identification	Model, drawing, revision and serial/batch reference
Job context	Bore profile, enlargement stage and formation log
Rig and assembly	Rig model, mating components, swivel and connection
Operating evidence	Torque, pullback, rotation, pressure, flow and event timeline
Condition evidence	Overall, cutter, nozzle, body and connection photographs

Escalate abnormal damage Quarantine the reamer after a drop, cutter loss, body crack, washout, connection damage or repeated hydraulic fault. Do not weld, grind, heat or reshape it without an approved repair instruction.

Post-run wear map

Number the blades or divide the circumference into repeatable sectors. Record cutter loss/chipping, gauge wear, erosion, hardfacing condition and nozzle condition by location so uneven patterns can be compared between runs.

Location / sector	Cutters & gauge	Body / hardfacing	Nozzle / passage	Photo ref.

Run event record

Time / depth	Formation or event	Torque / pullback / pressure trend	Action and result