

Operating Procedures

Use the following general guidelines to avoid bit damage when putting a new bit into service and to ensure optimum performance.

1

HOLE INSPECTION

- Inspect previous bit for junk damage, lost cutters or insert and gage wear;
- Make clean-up trip if necessary;
- If drilling out float equipment with a PDC bit, confirm that the product is PDC-drillable;

2

BIT PREPARATION

- Use a rubber mat or wooden pad to set the bit on while inspecting;
- Inspect the cutting elements for damage;
- Verify inside of bit is clean and free of any foreign matter;
- Verify that bit gauge complies with API standards;
- Ensure that nozzle o-rings are in place;
- Install proper nozzles; Do not over-tighten.

3

MAKING UP THE BIT

- Handle the bit with care;
- Do not set the bit directly on the steel deck. Use a wooden pad or rubber mat;
- Fit the breaker to the bit;
- Clean and grease the bit pin;
- Lower the drill string onto the pin and engage the threads;
- Locate the bit and breaker in the rotary, and make-up to the recommended torque.

4

TRIPPING IN THE HOLE

- Remove the breaker and carefully lower the bit through the rotary table;
- Trip slowly through BOPs, casing shoes and liner hangers;
- Note the presence and location of tight spots previously observed when pulling the previous bit out of the hole;
- Trip slowly through tight spots, dog legs or ledges;
- Wash the last three joints to bottom with full flow at 40 to 60 rpm;
- Approach the bottom cautiously by observing weight and rotary-torque indicators;
- Tag bottom gently and pick up off bottom approximately one foot;
- Circulate for 5 to 10 minutes with full flowrate at 40 to 60 rpm.

5

REAMING

- Reaming long sections of under gauge hole is not recommended;
- If reaming is necessary, observe the following guidelines:
 - Ream with full flow
 - Use 40 to 60 rpm and 2,000 to 4,000 lbs weight-on-bit.
 - Ream slowly and avoid high torque.

6

BIT BREAK-IN

- Lower bit to bottom with full flow;
- Use 2,000 to 4,000 lbs. weight-on-bit and 60 to 80 rpm to establish bottom-hole pattern;
- Record pump strokes and stand pipe pressure;
- Slowly break the bit in, drilling at least three feet;
- Increase the weight by 2,000-pound increments to determine optimum drilling weight-on-bit;
- While maintaining constant weight-on-bit, vary the rotary speed to determine optimum drilling parameters.

7

DRILLING AHEAD

- Reduce rotary speed in abrasive or hard stringers to increase bit life.
- Adjust rotary speed and weight-on-bit as formation changes or stringers are encountered to maintain optimum drilling performance.
- After making connections observe the following guidelines:
 - Reset pump strokes and check standpipe pressure.
 - Set bit approximately six inches off bottom and pump for 30 seconds before drilling.
 - Slowly lower bit to bottom at 60 to 80 rpm.
 - Add weight slowly to attain previous weight on-bit, then increase rotary speed to previous rpm.
- Do not jam the bit back to bottom after making connections.