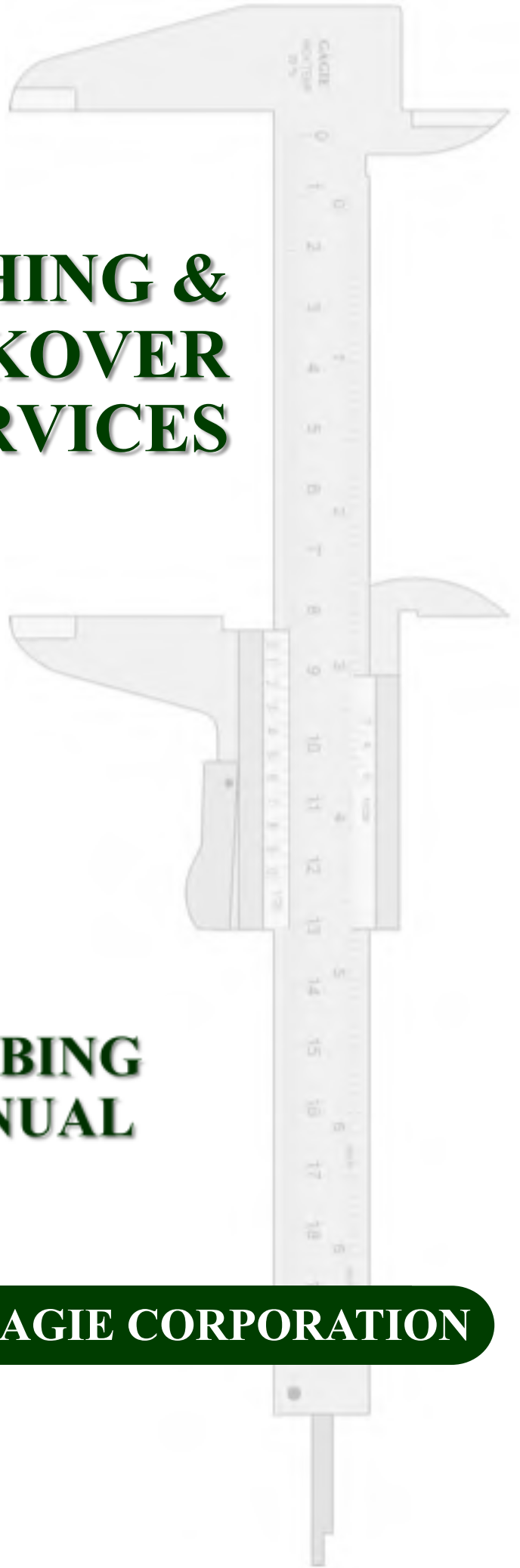




FISHING & WORKOVER SERVICES

THRU-TUBING BHA MANUAL

GAGIE CORPORATION





WASH TOOL BHA

Page 1

STANDARD MILLING BHA

Page 2

WASHOVER BHA's

Page 3

COILED TUBING MILLING BHA

Page 4

TUBING CUTTER BHA

Page 5

FISHING BHA

Page 6

VENTURI JET JUNK BASKET BHA

Page 7

LIB BHA

Page 8

SLIDING SLEEVE SHIFTING BHA

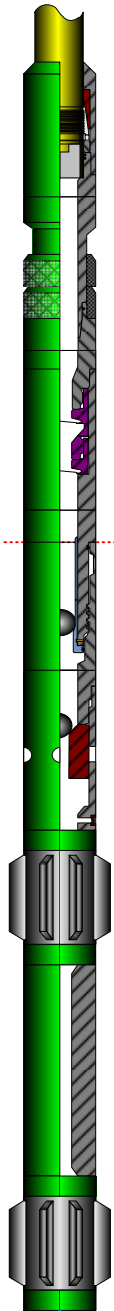
Page 9



TYPICAL BOTTOM HOLE ASSEMBLY

WASH TOOL BHA

FOR CLEANOUT OPERATIONS INCLUDING TUBING, CASING, SAND SCREENS, SLOTTED LINERS, NIPPLE PROFILES, SLIDING SLEEVES ETC.



COILED TUBING CONNECTOR

EXTERNAL SLIP
INTERNAL SLIP
ROLL-ON (OR ROLL-OVER)
DIMPLE-ON

DEPLOYMENT QUICK CONNECTOR EG. "CARSAQ"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY CONSISTING OF:

DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

STABILISER

IF REQUIRED

STRAIGHT BAR

OPTIONAL. HELPS BHA TO PASS LEDGES
SUCH AS GAS LIFT MANRELS

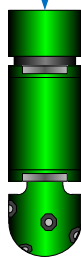
STABILISER

IF REQUIRED

WASH TOOL



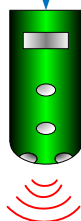
STANDARD
ROTATING
WASH TOOL



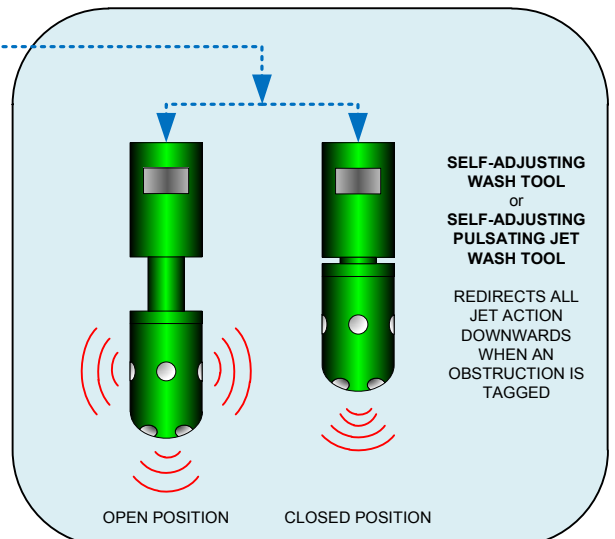
CONTROLLED
ROTATION
WASH TOOL
(VARIOUS HEADS
AVAILABLE)



MULTI-JET
WASH TOOL
(FIELD ADJUSTABLE
HEAD)



PULSATING JET
WASH TOOL
(VARIOUS HEADS
AVAILABLE)



SELF-ADJUSTING
WASH TOOL
OR
SELF-ADJUSTING
PULSATING JET
WASH TOOL

REDIRECTS ALL
JET ACTION
DOWNWARDS
WHEN AN
OBSTRUCTION IS
TAGGED

OPEN POSITION

CLOSED POSITION

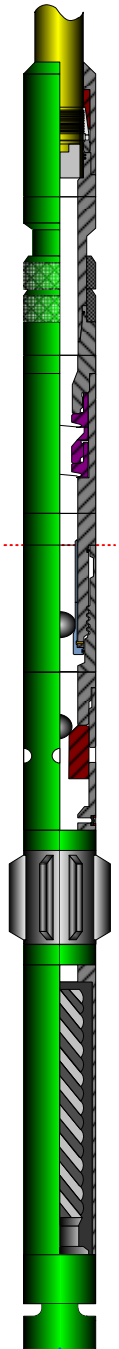
OUTLINE RUN PROCEDURE

1. PREPARE BHA: SELECT NOZZLE SIZES, CONFIGURATION AND HEAD FOR WASH TOOL ACCORDING TO FLOW RATE VS. PRESSURE DROP CALCULATIONS (OR USING TOOL SPECIFIC SPREADSHEET PROGRAM). CHECK BALL SEAT SIZES IN MHA AND INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS & RECORD WITH TOOL SERIAL NUMBERS
2. INSTALL IN-LINE FILTER BETWEEN PUMP AND CT REEL. ENSURE FLUID SYSTEM IS CLEAN & FREE OF PIPE SCALE ETC.
3. PREPARE END OF COILED TUBING (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL TEST AND PRESSURE TEST COILED TUBING CONNECTOR
4. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
5. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES
6. MAKE-UP AND PRESSURE TEST CT RISER. USUALLY FLAPPER CHECK VALVES ARE THEN TESTED BY BLEEDING BACK THROUGH THE REEL. ZERO CT COUNTER
7. RUN IN HOLE. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES
8. PERFORM WASHING OPERATION AT SLOW SPEED ACROSS REQUIRED WORKING DEPTH(S). RECIPROCATATE AS REQUIRED
9. POOH. TAG STRIPPER TO CHECK DEPTH COUNTER
10. BREAKOUT RISER AND BHA
11. IN SOME CASES CT CONNECTOR MAY BE RE-RUN. OTHERWISE REMOVE BY CUTTING COIL 10" ABOVE CONNECTOR
12. DISASSEMBLE AND CLEAN TOOLS ASAP TO AVOID CORROSION. REDRESS TOOLS BEFORE RE-RUNNING



TYPICAL BOTTOM HOLE ASSEMBLY STANDARD MILLING BHA

FOR MILLING PLUGS, SCALE, CEMENT, JUNK & DEBRIS, DAMAGED TUBING, NIPPLE ENLARGEMENT, HARD FILL REMOVAL ETC.



COILED TUBING CONNECTOR

EXTERNAL SLIP (RECOMMENDED)
INTERNAL SLIP (SLIMHOLE)
DIMPLE-ON (ACCEPTABLE)
ROLL-ON (NOT SUITABLE)

DEPLOYMENT QUICK CONNECTOR EG. "CARSAC"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY CONSISTING OF:

DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

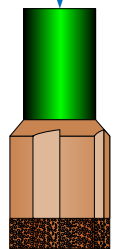
STABILISER

IF REQUIRED
TYPICALLY 1/16" - 1/8" SMALLER THAN MILL OD

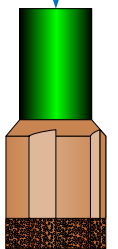
WORKOVER MOTOR

FOR MAXIMUM EFFICIENCY AND MOTOR LIFE,
OPERATE MOTOR AT 80% OF MAX FLOW RATE
AND 50 - 80% OF MAX LOAD

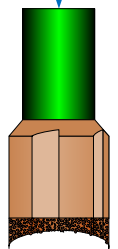
MILL



BLADED JUNK MILL



FLAT BOTTOM MILL



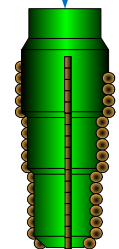
CONCAVE MILL



TAPER MILL



BULLNOSE MILL



STEP MILL



REAMER STRING MILL WITH TAPER MILL BELOW FOR IMPROVED WALL CLEANING

OUTLINE RUN PROCEDURE

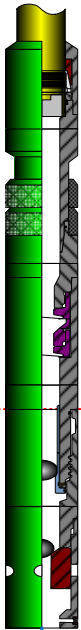
1. PREPARE BHA: SELECT MOTOR & STATOR TYPE/FIT TO SUIT JOB AND TEMP. CHECK BALL SEAT SIZES IN MHA & INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS. RECORD WITH TOOL SERIAL NUMBERS
 2. INSTALL IN-LINE FILTER BETWEEN PUMP AND CT REEL. ENSURE FLUID SYSTEM IS CLEAN & FREE OF PIPE SCALE ETC.
 3. PREPARE END OF COIL (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL AND PRESSURE TEST COILED TUBING CONNECTOR. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
 4. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES. DON'T SIDeload MOTOR
 5. FUNCTION TEST MOTOR. RECORD PRESSURE VS PUMP RATE
 6. MAKE-UP & PRESSURE TEST CT RISER. USUALLY FLAPPER CHECK VALVES ARE THEN TESTED BY BLEEDING BACK THROUGH THE REEL. ZERO CT COUNTER
 7. RUN IN HOLE. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES. PUMP AT MINIMUM RATE IF REQUIRED
 8. SLOW DOWN 100 FT BEFORE OBSTRUCTION, TAG OBSTRUCTION SLOWLY THEN PICK-UP 20 FT
 9. CIRCULATE TO ESTABLISH RETURNS. ESTABLISH UP/DOWN WEIGHTS AND PUMP/RETURN PRESSURES FOR REFERENCE
 10. START MILLING WITH LOW WOB. ESTABLISH MILLING PATTERN AND ADJUST PARAMETERS AS REQUIRED. AIM FOR ON-OFF BOTTOM PRESSURE DIFFERENTIAL OF 50 - 80% OF FULL LOAD DIFFERENTIAL FOR THE SPECIFIC TYPE OF MOTOR BEING RUN. GAGIE SPECIALIST WILL PROVIDE MILLING RECOMMENDATIONS
- *** Never pickup from motor stall without stopping pump or reducing pump rate to minimum. See detailed stall procedure ***
11. AFTER REACHING TARGET DEPTH THE WELLBORE MAY BE CIRCULATED CLEAN BY HIGH PUMP RATE AFTER OPENING CIRCULATION VALVE WITH DROP BALL. POOH
 12. AT SURFACE, REPEAT MOTOR FUNCTION TEST AND RECORD
 13. BREAKOUT BHA AND REMOVE CONNECTOR BY CUTTING COIL 10" ABOVE CONNECTOR. FLUSH MOTOR WITH FRESH WATER AND SUITABLE OIL TO PREVENT CORROSION. DISASSEMBLE & CLEAN OTHER TOOLS ASAP

SPECIALIST MILLS INCLUDING DIAMOND MATRIX, PDC, BI-CENTRE, PILOT MILLS ETC. ARE ALSO AVAILABLE FROM GAGIE CORPORATION



TYPICAL BOTTOM HOLE ASSEMBLY WASHOVER BHAS

FOR WASHING OVER A FISH OR DRESSING-OFF TOP OF A FISH



COILED TUBING CONNECTOR

- EXTERNAL SLIP (RECOMMENDED)
- INTERNAL SLIP (SLIMHOLE)
- DIMPLE-ON (ACCEPTABLE)
- ROLL-ON (NOT SUITABLE)

DEPLOYMENT QUICK CONNECTOR EG. "CARSAC"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY CONSISTING OF:

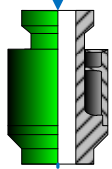
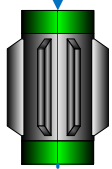
DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)



STABILISER or JUNK (BOOT) BASKETS

IF REQUIRED
* BOOT BASKET TYPICALLY
ONLY USED IN TUBING LARGER
THAN 4"

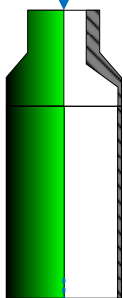


WORKOVER MOTOR

FOR MAXIMUM EFFICIENCY AND MOTOR LIFE,
OPERATE MOTOR AT 80% OF MAX FLOW RATE
AND 50 - 80% OF MAX LOAD

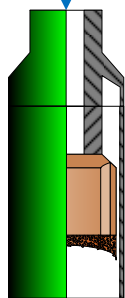
WASHOVER ASSEMBLY

SKIRTED MILL ASSEMBLY



DRIVE SUB

WASHPIPE
EXTENSIONS

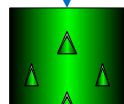
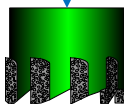
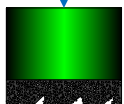
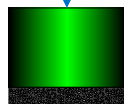
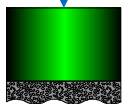


TRIPLE CONNECTION BUSHING
(TCB)

WASHPIPE EXTENSION WITH
CROSSOVER (DOUBLE BOX
SUB IF REQUIRED), PONY
COLLARS (FOR SPACE OUT, IF
REQUIRED) AND MILL (EG.
CONCAVE MILL)

WASHOVER SHOE

WASHOVER SHOE



WASHOVER
SHOE
MODIFIED TO
INCREASE
PROBABILITY OF
RECOVERING
FISH DURING
WASHOVER RUN

WAVY
BOTTOM
(SCALLOPED)

TOOTHED
(CASTELLATED)

SAW TOOTH
(CASED HOLE)

SAW TOOTH
(OPEN HOLE)



DIAMOND SHOES ARE OFTEN
CUSTOM BUILT FOR SPECIFIC
APPLICATIONS & USED FOR
WASHING OVER ITEMS SUCH
AS RETRIEVABLE PACKERS
CONTAINING HARD MATERIALS
EG. CARBIDE, INCOLLOY, HIGH
CHROME & HARDENED SLIPS.
DIAMOND GRINDS MATERIAL
SLOWLY WITH LOW WOB &
LOW TORQUE. THE CROWN IS
IMPREGNATED WITH DIAMOND
GRIT & MAY ALSO CONTAIN
EXPOSED DIAMONDS

WHEN TO PERFORM WASHOVER OPERATIONS?

REMOVE JUNK AND DEBRIS STUCK FROM OD OF A FISHNECK AND TO FREE STUCK BHAs AND STUCK PIPE. THE SHOE MAY NEED A STOP SHOULDER ON THE INSIDE TO PREVENT WASHING OVER TOO FAR. SUCCESSFUL WASHOVER IS THEN FOLLOWED BY RUNNING AN OVERSHOT.

GOOD ALTERNATIVE TO MILLING PACKERS AND PLUGS. THE WASHOVER SHOE SHOULD BE SIZED TO REMOVE THE SLIPS AND ELEMENT BUT LEAVE THE BODY ("MANDREL") INTACT SO THAT IT CAN BE FISHED WITH AN OVERSHOT AFTER WASHOVER.

CUT A FISHNECK ONTO THE OUTSIDE OF A STUCK FISH WHICH HAS TOO BIG OF AN OD TO RECOVER WITH AN OVERSHOT

RECOVER TIGHTLY BALLED UP WIRE OR CABLE THAT CANNOT BE FISHED WITH A ROPE SPEAR OR WIRE GRAB.

WASHOVER SHOE SELECTION & DESIGN

SINCE EVERY SCENARIO AND FISH IS DIFFERENT SHOES ARE OFTEN BUILT AND DRESSED TO SPECIFIC REQUIREMENTS OF ID, OD, LENGTH, CUTTING STRUCTURE AND CROWN GEOMETRY.

CASED HOLE WASHOVER SHOES ALWAYS HAVE A SMOOTH OD TO PREVENT CASING/TUBING DAMAGE, WHILE OPEN HOLE SHOES HAVE COURSE CARBIDE ON THE OD.

SMALLER SHOES RUN ON 1-11/16" AND 2-1/8" MOTORS USUALLY HAVE A WAVY BOTTOM TO MINIMISE TORQUE & MOTOR STALLS.

LARGER SHOES WITH WALL THICKNESS > 3/8" CAN BE DRESSED WITH CARBIDE INSERTS FOR MORE EFFICIENT CUTTING & FASTER ROP.

SKIRTED MILLS

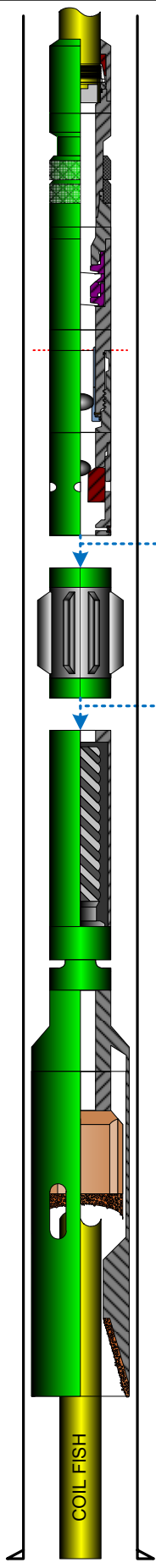
USED TO DRESS THE TOP OF A FISH. THE SHOE CENTRALIZES THE FISH WHILE CUTTING AWAY ANY JUNK/DEBRIS AROUND THE TOP, WHILE THE INNER MILL DRESSES-OFF THE TOP OF FISH.

OUTLINE RUN PROCEDURE

REFER TO OUTLINE RUN PROCEDURE FOR TYPICAL MILLING BHA.



TYPICAL BOTTOM HOLE ASSEMBLY COILED TUBING MILLING BHA FOR MILLING COIL OR DRESSING-OFF TOP OF COIL FISH



COILED TUBING CONNECTOR (CTC)

- EXTERNAL SLIP (RECOMMENDED)
- INTERNAL SLIP (SLIMHOLE)
- DIMPLE-ON (ACCEPTABLE)
- ROLL-ON (NOT SUITABLE)

DEPLOYMENT QUICK CONNECTOR
EG. "CARSAC"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY (MHA)
CONSISTING OF:

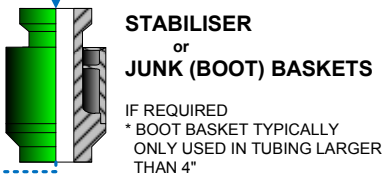
DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)



STABILISER
or
JUNK (BOOT) BASKETS

IF REQUIRED
* BOOT BASKET TYPICALLY
ONLY USED IN TUBING LARGER
THAN 4"

WORKOVER MOTOR

FOR MAXIMUM EFFICIENCY AND MOTOR LIFE,
OPERATE MOTOR AT 80% OF MAX FLOW RATE
AND 50 - 80% OF MAX LOAD

TRIPLE CONNECTION BUSHING (TCB)

SKIRTED MILL
TYPICALLY CONCAVE BOTTOM MILL
SLOTTED SKIRT FOR CIRCULATING OUT CUTTINGS

THROATED GUIDE OR WASHOVER SHOE
DRESSED WITH CARBIDE IF REQUIRED

WHEN TO MILL COILED TUBING?

WHEN COILED TUBING IS PARTED DOWNHOLE WHILE IN TENSION THE TOP WILL TYPICALLY BE NECKED INWARDS AND MAY PREVENT THE PASSAGE OF AN E-LINE CUTTER OR DROP BALL DURING FISHING OPERATIONS. WHEN COILED TUBING IS PARTED DOWNHOLE WHILE IN COMPRESSION THE TOP IS OFTEN OUT-OF-ROUND OR BENT OVER. DEFORMATION MAY ALSO BE CAUSED BY BURST OR COLLAPSE AND WHEN COIL IS CUT BY A SHEAR RAM OR DOWNHOLE SEVERING TOOL IN ANY CASE, A SKIRTED MILLING ASSEMBLY CAN BE USED TO DRESS-OFF THE DEFORMED SECTION OF THE TOP OF FISH BEFORE FISHING.

MILLING SIGNIFICANT LENGTHS OF COILED TUBING IS USUALLY A LAST RESORT BECAUSE IT CAN BE SLOW AND OFTEN REQUIRES MULTIPLE RUNS. IF THE COIL FISH HAS MULTIPLE BREAKS THEN IT IS LIKELY TO SPIN AND NOT BE POSSIBLE TO MILL. A HEAVILY CORRODED COIL FISH MAY ALSO BREAK-UP MAKING IT IMPOSSIBLE TO MILL.

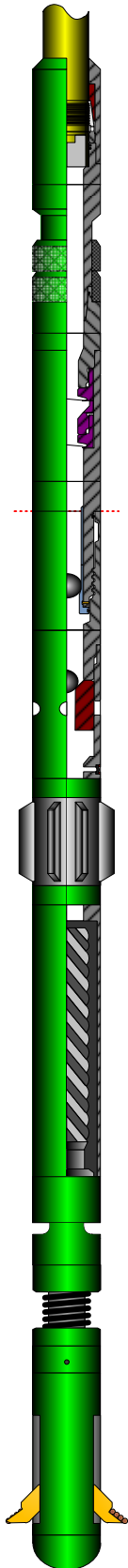
SKIRTED MILLING ASSEMBLY

DUE TO THE FLEXIBILITY AND RESIDUAL BEND IN COILED TUBING IT IS NECESSARY TO CENTRALIZE THE COIL FISH ONTO THE MILL FACE. THIS IS ACHIEVED BY HAVING A THROATED GUIDE OR WASHOVER SHOE WITH LONG THROAT OF DIAMETER SLIGHTLY LARGER THAN THE NOMINAL COIL SIZE. CARBIDE DRESSING ON THE BOTTOM AND INSIDE OF THE GUIDE WILL HELP TO GET OVER THE TOP OF THE COIL FISH IN CASE IT IS BENT OVER OR OUT-OF-ROUND AS WELL AS CUTTING AWAY ANY DEBRIS JAMMED AROUND THE COIL FISH. THE GUIDE OR SHOE IS THREADED ONTO THE OUTER CONNECTION OF A TRIPPLE CONNECTION BUSHING WHILE THE MILL IS THREADED ONTO THE INNER CONNECTION. SLOTS OR PORTS ARE OFTEN NECESSARY ON THE SKIRT TO ALLOW CUTTINGS TO BE CIRCULATED OUT. THE INSIDE OF THE THROAT MAY ALSO BE FLUTED FOR CUTTINGS CIRCULATION.

OUTLINE RUN PROCEDURE

USUALLY A LIB IMPRESSION IS TAKEN OF THE TOP OF FISH BEFORE AND AFTER MILLING. REFER TO TYPICAL MILLING BHA RUN PROCEDURE.

TYPICAL BOTTOM HOLE ASSEMBLY TUBING CUTTER BHA



COILED TUBING CONNECTOR

EXTERNAL SLIP (RECOMMENDED)
INTERNAL SLIP (SLIMHOLE)
DIMPLE-ON (ACCEPTABLE)
ROLL-ON (NOT SUITABLE)

DEPLOYMENT QUICK CONNECTOR EG. "CARSAC"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY CONSISTING OF:

DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

STABILISER

IF REQUIRED
TYPICALLY 1/8" - 1/4" SMALLER THAN
TUBING ID OR NIPPLE ID RESTRICTION

WORKOVER MOTOR

FOR MAXIMUM EFFICIENCY AND MOTOR
LIFE, OPERATE MOTOR AT 80% OF MAX
FLOW RATE AND 50 - 80% OF MAX LOAD

HYDRAULIC TUBING CUTTER

THREE BLADED
SELF CENTRALISING TYPE
DRESSED WITH KNIVES TO SUIT SPECIFIC
TUBING SIZE AND WEIGHT

BULLNOSE

OUTLINE RUN PROCEDURE

*TUBING CUTS ARE MORE EFFICIENT AND SUCCESSFUL WHEN THE
TUBING BEING CUT IS IN TENSION*

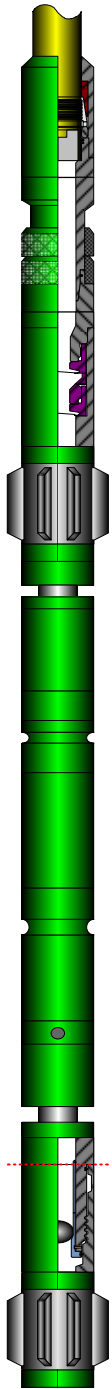
1. MAKE DUMMY RUN WITH SLICKLINE OR COIL TO DRIFT PAST REQUIRED CUT DEPTH
2. PREPARE BHA: SELECT MOTOR & STATOR TYPE/FIT TO SUIT JOB AND TEMP. CHECK BALL SEAT SIZES IN MHA & INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS. RECORD WITH TOOL SERIAL NUMBERS
3. INSTALL IN-LINE FILTER BETWEEN PUMP AND CT REEL. ENSURE FLUID SYSTEM IS CLEAN & FREE OF PIPE SCALE ETC.
4. PREPARE END OF COIL (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL AND PRESSURE TEST COILED TUBING CONNECTOR. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
5. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES. DON'T SIDeload MOTOR
6. FUNCTION TEST MOTOR AND CUTTER. RECORD PRESSURE VS PUMP RATE AND KNIFE OPENING. RE-PIN KNIVES AFTER TEST
7. MAKE-UP AND PRESSURE TEST CT RISER. ZERO CT COUNTER
8. RUN IN HOLE. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES. DO NOT PUMP (OR MINIMUM RATE IF NECESSARY)
9. RUN 20+ FT PAST CUT DEPTH THEN PICK UP TO CUT DEPTH (AIM TO CUT AT MIDDLE OF A TUBING JOINT)
10. PUMP SLOWLY AND GRADUALLY INCREASE PUMP RATE TO BED THE KNIVES IN. DEPENDING ON THE SCENARIO THERE MAY BE INDICATION WHEN CUT IS COMPLETE. CUT USUALLY TAKES ONLY 5 - 10 MINUTES
11. STOP PUMPING AND WAIT FOR COIL TO DRAIN & MOTOR TO STOP ROTATING. PICK-UP SLOWLY FROM CUT
12. SOMETIMES A SECOND CUT MAY BE MADE FURTHER UP THE HOLE, DEPENDING ON KNIFE WEAR
13. POOH WIHTOUT PUMPING (OR MINIMUM PUMP RATE)
14. AT SURFACE, REPEAT MOTOR FUNCTION TEST
15. EXAMINE KNIFE WEAR FOR INDICATION OF THE CUT QUALITY
16. BREAKOUT BHA & REMOVE CONNECTOR BY CUTTING COIL 10" ABOVE CONNECTOR
17. FLUSH MOTOR WITH FRESH WATER AND SUITABLE OIL TO PREVENT CORROSION. DISASSEMBLE & CLEAN OTHER TOOLS ASAP

NOTES:

- * IF A NIPPLE PROFILE LOCATOR IS REQUIRED FOR DEPTH CORRELATION THEN IT MAY BE USED ABOVE THE MOTOR AND MUST BE RATED FOR TORQUE
- * A HYDRAULIC ACTUATED TUBING ANCHOR MAY BE USED ABOVE THE MOTOR AND IS RECOMMENDED IN SOME CASES, EG. ON A 'FLOATER' RIG



TYPICAL BOTTOM HOLE ASSEMBLY FISHING BHA FOR ENGAGING INTERNAL & EXTERNAL FISHNECKS



COILED TUBING CONNECTOR

- EXTERNAL SLIP (RECOMMENDED)
- INTERNAL SLIP (SLIMHOLE)
- DIMPLE-ON (NOT RECOMMENDED)
- ROLL-ON (NOT SUITABLE)

DEPLOYMENT QUICK CONNECTOR EG. "CARSAC"

- OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

DUAL FLAPPER CHECK VALVE

STABILSER

- IF REQUIRED

BI-DI ACCELERATOR (INTENSIFIER)

- OPTIONAL. FOR INCREASING JAR HIT
BUT MUST BE USED FOR SHALLOW FISHING

WEIGHT BAR(S)

- OPTIONAL. TO INCREASE JARRING 'IMPULSE'
ONLY USE IF LUBRICATOR LENGTH ALLOWS

BI-DI JAR

- HYDRAULIC JARS HAVE MOSTLY OBSOLETE
MECHANICAL JARS.

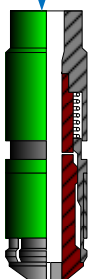
HEAVY DUTY HYDRAULIC DISCONNECT

- ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

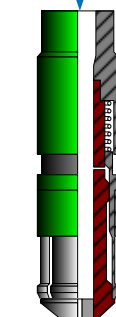
STABILSER

- IF REQUIRED

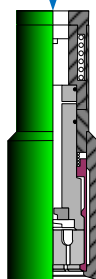
HYDRAULIC RELEASE SPEAR OR OVERSHOT



HYDRAULIC 'GS'
SPEAR



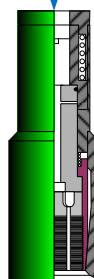
EXTENDED REACH
HYDRAULIC 'GS'
SPEAR



HYDRAULIC 'JDC'
OVERSHOT



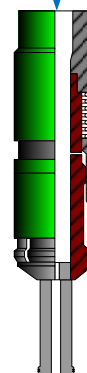
HYDRAULIC
'SLICK-CATCH'
SPEAR



HYDRAULIC
'SLICK-CATCH'
OVERSHOT



HYDRAULIC
'PARAGON' (TTS)
SPEAR



HYDRAULIC 'GS'
SPEAR WITH
PROBE (PRONG)
EG. FOR
EQUALISING
PLUGS OR
OPERATING
PACKER
RELEASE
MECHANISM

OUTLINE RUN PROCEDURE

"LUBRICATOR LENGTH" = MASTER VALVE TO CT STRIPPER. ENSURE THIS IS LONG ENOUGH FOR LENGTH OF BHA (WITH JAR AND ACC FULLY OPEN) PLUS LENGTH OF THE FISH.

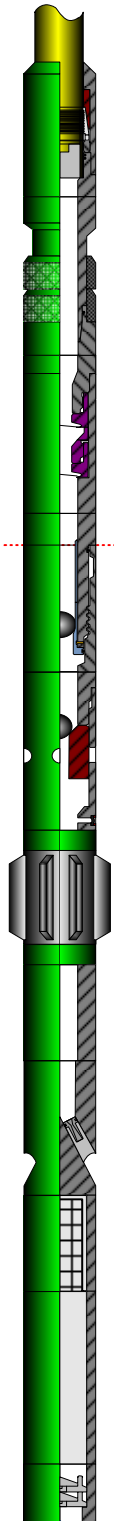
1. PREPARE BHA: FIT OVERSHOT OR SPEAR WITH ORIFICE TO SUIT THE JOB. CHECK BALL SEAT SIZE IN DISCONNECT & INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS. RECORD WITH TOOL SERIAL NUMBERS
2. INSTALL IN-LINE FILTER BETWEEN PUMP AND CT REEL. ENSURE FLUID SYSTEM IS CLEAN & FREE OF PIPE SCALE ETC.
3. PREPARE END OF COIL (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL AND PRESSURE TEST COILED TUBING CONNECTOR. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
4. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES
5. FUNCTION TEST OVERSHOT OR SPEAR AND RECORD RELEASE FLOW RATES
6. MAKE-UP & PRESSURE TEST CT RISER. USUALLY FLAPPER CHECK VALVES ARE THEN TESTED BY BLEEDING BACK THROUGH THE REEL. ZERO CT COUNTER
7. RIH. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES
8. AT ~100 FT ABOVE TOF CHECK UP/DOWN WEIGHTS FOR REFERENCE
9. IT IS COMMON TO CIRCULATE WHEN REACHING TOF TO CLEAN THE FISHNECK AND GET PRESSURE INDICATION. SET DOWN TO ENGAGE FISH, STOP PUMP THEN PICK-UP TO CHECK ENGAGEMENT
10. TO FIRE JAR UPWARDS SIMPLY TAKE OVERPULL AND WAIT FOR JAR TO FIRE. TO RE-COCK JAR CYCLE WEIGHT DOWN PAST NEUTRAL THEN REPEAT OVERPULL TO FIRE JAR UP AGAIN.
11. TO RELEASE FROM FISH, SET-DOWN PAST NEUTRAL WEIGHT. START PUMPING THEN PICK-UP. FISH CAN RE-ENGAGED IF REQUIRED
12. WHEN FISH COMES FREE, POOH WITHOUT PUMPING
13. AT SURFACE, RELEASE FISH, BREAKOUT BHA AND REMOVE CONNECTOR BY CUTTING COIL 10" ABOVE CONNECTOR
14. FLUSH JAR AND ACCELERATOR WITH FRESH WATER THEN OIL. DISASSEMBLE AND CLEAN ALL OTHER TOOLS ASAP TO AVOID CORROSION THEN REDRESS BEFORE RE-RUNNING TOOLS



TYPICAL BOTTOM HOLE ASSEMBLY

VENTURI JET JUNK BASKET BHA

FOR RECOVERING JUNK AND DEBRIS



COILED TUBING CONNECTOR (CTC)

EXTERNAL SLIP
INTERNAL SLIP
DIMPLE-ON
ROLL-ON (NOT RECOMMENDED)

DEPLOYMENT QUICK CONNECTOR EG. "CARSAAC"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY (MHA) CONSISTING OF:

DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

STABILISER

IF REQUIRED

DOUBLE BOX SUB

NOTE: VJJB USUALLY HAS PIN UP

VENTURI JET JUNK BASKET (VJJB)

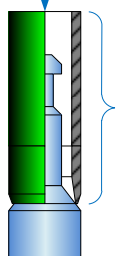
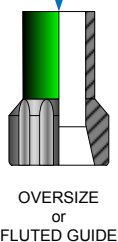
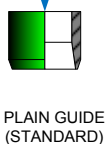
* INCLUDES VENTURI AND SCREEN SECTIONS AND CATCHER HOUSING WITH PLAIN GUIDE.
** EXTENSIONS, SPECIAL GUIDES ETC ARE ORDERED SEPERATELY.

VJJB BARREL EXTENSION(S)

LENGTH AS REQUIRED. INSIDE CAPACITY SHOULD BE 30 - 50% MORE THAN REQUIRED FOR THE EXPECTED VOLUME OF DEBRIS OR AS LIMITED BY MAXIMUM BHA LENGTH.

VJJB CATCHER HOUSING

VJJB GUIDE



To clean and washover a fishneck without jamming or breaking VJJB catchers

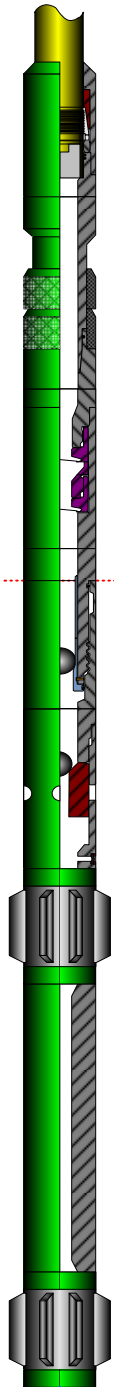
OUTLINE RUN PROCEDURE

1. PREPARE BHA: CALCULATE CORRECT NOZZLE SIZES FOR VENTURI (BASED ON PUMP RATE & CIRCULATING FLUID WT TO OBTAIN 500 - 1,000 PSI PRESSURE DROP or 300 - 400 PSI WHEN RUNNING THE VJJB BELOW A MOTOR). CHECK BALL SEAT SIZES IN MHA & INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS. RECORD WITH TOOL SERIAL NUMBERS
2. INSTALL IN-LINE FILTER BETWEEN PUMP AND CT REEL. ENSURE FLUID SYSTEM IS CLEAN & FREE OF PIPE SCALE ETC.
3. PREPARE END OF COIL (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL AND PRESSURE TEST COILED TUBING CONNECTOR. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
4. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES. BEWARE OF THIN WALL OF VENTURI COMPONENTS INCLUDING EXTENSIONS.
5. PUMP THRU BHA TO CONFIRM NO BLOCKAGE. IF REQUIRED, DEMONSTRATE VENTURI WITH A CUP FULL OF BALL BEARINGS IN A BUCKET FULL OF WATER. LOWER VENTURI INTO THE BUCKET WHILE PUMPING. THE FLUID AND BALL BEARINGS WILL BE SUCKED INTO THE VENTURI. STOP PUMP. AFTER TEST BREAKOUT VJJB BARREL TO REMOVE BALL BEARINGS & REMAKE THE CONNECTION
6. MAKE-UP & PRESSURE TEST CT RISER. USUALLY FLAPPER CHECK VALVES ARE THEN TESTED BY BLEEDING BACK THROUGH THE REEL. ZERO CT COUNTER
7. RUN IN HOLE. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES. PUMP AT MINIMUM RATE IF REQUIRED
8. SLOW DOWN 100 FT BEFORE OBSTRUCTION, TAG OBSTRUCTION SLOWLY, FLAG PIPE THEN PICK-UP 20 FT
9. CIRCULATE TO ESTABLISH RETURNS. ESTABLISH UP/DOWN WEIGHTS AND PUMP/RETURN PRESSURES FOR REFERENCE
10. PUMP TO ACTIVATE VENTURI AND WORK VENTURI DOWNWARDS SLOWLY. RECIPROCATATE UP/DOWN AS REQUIRED
11. MONITOR DEPTH PROGRESS FROM THE ORIGINAL FLAG & POOH WHEN IT IS BELIEVED THE MAXIMUM AMOUNT OF DEBRIS HAS BEEN RECOVERED OR IF NO FURTHER DEPTH CAN BE MADE
12. WHILE POOH IT IS POSSIBLE TO CLEAN-UP ANY 'POCKETS' (EG. GAS LIFT MANDRELS) THAT MAY CONTAIN SETTLED DEBRIS BY PUMPING THROUGH THE VENTURI AGAIN & RECIPROCATING OVER THE AREA
13. BREAKOUT BHA & EXAMINE VENTURI FOR RECOVERY. SERVICE THE VENTURI AND MAKE ANOTHER RUN IF REQUIRED.
14. IN SOME CASES CT CONNECTOR MAY BE RE-RUN. OTHERWISE REMOVE BY CUTTING COIL 10" ABOVE CONNECTOR
15. DISASSEMBLE & CLEAN ALL USED TOOLS ASAP TO AVOID CORROSION

GAGIE CORPORATION'S Venturi Jet Junk Baskets may be operated with circulating fluids, nitrogen gas or a mixture. The Venturi effect is not dependent on hole size. Eg. a 2-5/8" OD VJJB could be used inside 7" casing with the only limitation being the ID of the catchers in terms of the size of junk that can be recovered.

TYPICAL BOTTOM HOLE ASSEMBLY

LIB BHA
LEAD IMPRESSION BLOCK BHA



COILED TUBING CONNECTOR

EXTERNAL SLIP
INTERNAL SLIP
ROLL-ON (OR ROLL-OVER)
DIMPLE-ON

DEPLOYMENT QUICK CONNECTOR
EG. "CARSAQ"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY
CONSISTING OF:

DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

STABILISER

IF REQUIRED

STRAIGHT BAR

IF REQUIRED

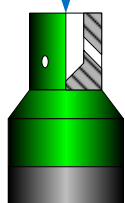
STABILISER

IF REQUIRED

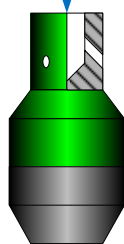
LEAD IMPRESSION BLOCK

OUTLINE RUN PROCEDURE

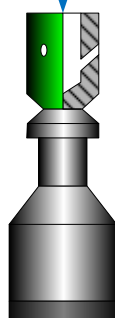
1. PREPARE BHA: CHECK BALL SEAT SIZES IN MHA & INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS. RECORD WITH TOOL SERIAL NUMBERS
2. PREPARE END OF COILED TUBING (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL TEST AND PRESSURE TEST COILED TUBING CONNECTOR
3. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
4. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES
5. MAKE-UP AND PRESSURE TEST CT RISER. USUALLY FLAPPER CHECK VALVES ARE THEN TESTED BY BLEEDING BACK THROUGH THE REEL. ZERO CT COUNTER
6. RUN IN HOLE. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES
7. SLOWDOWN AND TAKE UP/DOWN WEIGHTS FOR REFERENCE
8. CIRCULATE IF NECESSARY WHILE RUNNING DOWN SLOWLY UNTIL TAGGING TOP OF FISH THEN CONTINUE TO SET DOWN ENOUGH WEIGHT TO GET IMPRESSION. ONLY TAG ONCE THEN POOH.
9. TAG STRIPPER TO CHECK DEPTH COUNTER
10. BREAKOUT RISER AND BHA
11. IN SOME CASES CT CONNECTOR MAY BE RE-RUN. OTHERWISE REMOVE BY CUTTING COIL 10" ABOVE CONNECTOR
12. DISASSEMBLE AND CLEAN TOOLS ASAP TO AVOID CORROSION. REDRESS TOOLS BEFORE RE-RUNNING



FLAT LIB (PORTED)



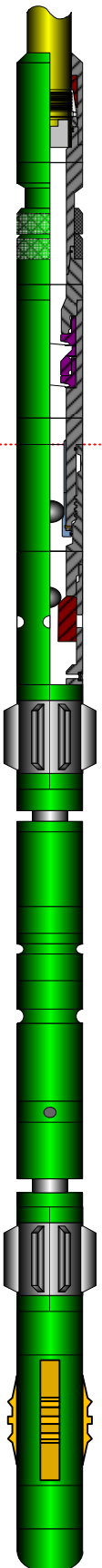
TAPER LIB (PORTED)



WIRELINE LIB
MAY BE RUN
ON COILED
TUBING WITH A
PORTED
CROSSOVER
TO ALLOW
CIRCULATION



TYPICAL BOTTOM HOLE ASSEMBLY SLIDING SLEEVE SHIFTING BHA USING HYDRAULIC EXPANDING BI-DIRECTIONAL SELECTIVE SHIFTING TOOL



COILED TUBING CONNECTOR

EXTERNAL SLIP (RECOMMENDED)
INTERNAL SLIP (SLIMHOLE)
DIMPLE-ON (NOT RECOMMENDED)
ROLL-ON (NOT SUITABLE)

DEPLOYMENT QUICK CONNECTOR EG. "CARSAC"

OPTIONAL
FOR SAFER MAKE-UP & BREAK-OUT

MOTOR HEAD ASSEMBLY CONSISTING OF:

DUAL FLAPPER CHECK VALVE

HYDRAULIC DISCONNECT

ACTUATED BY DROP BALL

CIRCULATION SUB

ACTUATED BY DROP BALL
C/W RUPTURE DISC (TYPICALLY 5,000 PSI)

STABILISER

IF REQUIRED
TYPICALLY 1/8" - 1/4" SMALLER THAN
TUBING ID OR NIPPLE ID RESTRICTION

BI-DI HAMMER ACCELERATOR

BI-DI IMPACT HAMMER

ACTIVATED BY PUMPING AND APPLYING
LIGHT OVERPULL OR SET-DOWN WEIGHT
(EG. TYPICALLY 300 - 3,000 LBS & 0.3 - 1.2
BPM FOR 2-1/4" IMPACT HAMMER)

STABILISER

IF REQUIRED
TYPICALLY 1/8" - 1/4" SMALLER THAN
TUBING ID OR NIPPLE ID RESTRICTION

HYDRAULIC BI-DI SHIFTING TOOL

GAGIE CORPORATION'S 2.20" OD HYDRAULIC EXPANDING BI-DIRECTIONAL SHIFTING TOOL MAY BE DRESSED WITH KEYS TO SHIFT OTIS OR BAKER CM SSDs IN 2-7/8" TO 4-1/2" TUBING. IT CAN SELECTIVELY SHIFT SSDs BOTH UP AND DOWN IN ONE RUN. IT CAN PASS THRU RESTRICTIONS AND INCORPORATES EMERGENCY SHEAR RELEASE. THE 3.00" OD TOOL CAN SHIFT SSDs IN TUBING UP TO 5-1/2"

BULLNOSE

OUTLINE RUN PROCEDURE

1. PREPARE BHA: FIT SHIFTING TOOL WITH ORIFICE (CHOKE) & NUMBER OF SHEAR SCREWS FOR EMERGENCY RELEASE (BASED ON CALCULATIONS & CT PULL/PUSH LIMITS AT WORKING DEPTH). CHECK BALL SEAT SIZES IN MHA & INSTALL SHEAR PINS & RUPTURE DISC TO SUIT JOB. MEASURE MAKE-UP LENGTH, OD & ID OF ALL TOOLS. RECORD WITH TOOL SERIAL NUMBERS
2. INSTALL IN-LINE FILTER BETWEEN PUMP AND CT REEL. ENSURE FLUID SYSTEM IS CLEAN & FREE OF PIPE SCALE ETC.
3. PREPARE END OF COIL (CUT AND STRAIGHTEN AS REQUIRED). MAKE UP, PULL AND PRESSURE TEST COILED TUBING CONNECTOR. PUMP LARGEST POSSIBLE BALL (AND/OR CLEANING PIG) THROUGH REEL TO REMOVE PIPE SCALE AND ENSURE NO OBSTRUCTION
4. MAKE UP REST OF BHA. ONLY USE WRENCHES ON HEAVY WALL AREAS ON TOOL BODIES
5. FUNCTION TEST SHIFTING TOOL. RESIZE ORIFICE IF NECESSARY. RECORD ACTIVATION FLOW RATES
6. MAKE-UP & PRESSURE TEST CT RISER. USUALLY FLAPPER CHECK VALVES ARE THEN TESTED BY BLEEDING BACK THROUGH THE REEL. ZERO CT COUNTER
7. RIH. SLOW DOWN WHEN PASSING RESTRICTIONS AND LEDGES
8. TO SHIFT SSD UP, RUN CT PAST THE SSD, START PUMPING TO EXPAND SHIFTING TOOL. RECIPROCATATE UP/DOWN TO ESTABLISH REFERENCE WEIGHTS THEN PULL UP SLOWLY INTO THE SSD. OBSERVE WEIGHT GAIN AS THE PROFILE IS ENGAGED THEN CONTINUE TO PULL THROUGH THE SSD SLOWLY. THE SSD WILL SHIFT AND WEIGHT WILL RETURN TO REFERENCE UP WEIGHT
9. TO SHIFT SSD DOWN, START ABOVE THE SSD, START PUMPING TO EXPAND SHIFTING TOOL. RECIPROCATATE UP/DOWN TO ESTABLISH REFERENCE WEIGHTS THEN RUN DOWN SLOWLY INTO THE SSD. OBSERVE WEIGHT LOSS AS THE PROFILE IS ENGAGED THEN CONTINUE TO PUSH THROUGH THE SSD SLOWLY. THE SSD WILL SHIFT AND WEIGHT WILL RETURN TO REFERENCE DOWN WEIGHT
10. WHILE SHIFTING SSD UP OR DOWN THE IMPACT HAMMER WILL AUTOMATICALLY START TO CREATE A VIBRATORY ACTION WHEN FLOW RATE AND PULL/PUSH WEIGHT IS WITHIN OPERATING RANGE
11. TO DEFLATE THE SHIFTING TOOL SIMPLY STOP PUMPING. IN UNLIKELY EVENT THAT SHIFTING TOOL KEYS DO NOT RELEASE THEN EMERGENCY RELEASE BY SHEARING UP OR DOWN. AFTER SHEAR RELEASE POOH BECAUSE THE TOOL WILL NO LONGER FUNCTION UNTIL IT HAS BEEN RE-PINNED AT SURFACE
12. THE BHA MAY BE MOVED UP OR DOWN THE HOLE (WITHOUT PUMPING) TO OTHER SSDs OR RUN BACK THROUGH THE SAME SLEEVE TO CONFIRM SHIFT.
13. POOH WITHOUT PUMPING
14. AT SURFACE, BREAKOUT BHA AND REMOVE CONNECTOR BY CUTTING COIL 10" ABOVE CONNECTOR
15. FLUSH IMPACT HAMMER AND ACCELERATOR WITH FRESH WATER THEN OIL. DISASSEMBLE AND CLEAN ALL OTHER TOOLS ASAP TO AVOID CORROSION THEN REDRESS BEFORE RE-RUNNING TOOLS



GAGIE CORPORATION

REGIONAL OFFICE

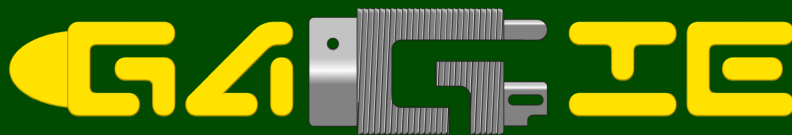
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GAGIE

FISHING SERVICES

“Gagie Corporation offers uncompromising focus to fulfill our customer’s needs to meet or exceed their expectations “