8.0
Checklist & Explanations

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8.1
Checklist

Baker Oil Tools Liner Hanger Checklist

This is a minimal check list to be made at the well site to ensure the equipment is correct, not damaged in shipment and that all necessary tools have been received at the well site. You are making the final check. Do not assume all things are correct. Make all checks physically possible to insure the success of the job. Check off each inspection with your initials, answer yes or no to questions and note measurements where indicated. This becomes a part of your service record and is to be submitted to the district with other well reports.

1 Physically check and record drill pipe (tech-fact S/2 pg.10) size _____ weight ____ grade _____ thread _____ID___
2 Physically check and record drill pipe (2 nd string of pipe) size _____ weight _____ grade _____ thread _____ID__
Check the drilling talley (DP, BHA, + Kelly Dn.) to ensure TD is where you were told it was!
3 Number of joints on location _____ Stands in derrick _____
4 Check with customer and record casing size _____ weight _____ grade _____ thread _____ID_____
5 Check with customer and record intermediate liner size_____weight_____grade_____ID_____
6 Will all equipment being run pass into intermediate casing/liner (yes-no)_____
7 Physically check and record liner size_____weight_____grade_____thread_____ID_____
8 Did you measure the length of the liner (yes --no) Talley the liner strap (yes--no)
9 Total number of liner jts on location _____ jts.
10 Physically check and record hanger size _____ weight _____ grade _____ thread _____ cone OD____
11 Physically check hanger operating mechanism(mechanical hanger) (yes -- no)
12 Look up hanger load capacity and record _____ lbs.
13 Physically check hanger shear pins size _____ total number of pins _____ pressure to shear pins _____ psi.
14 Physically check liner packer shear pins _____ total number of pins _____ setting force to shear pins ____ lbs
15 Physically check liner tieback extension OD. _____ ID_____ collapse _____ burst _____
16 Physically check setting tool for obstructions (yes --no)
17 Physically check setting tool thread type (yes -- no)
18 Compatible with customers pipe (yes -- no) If not, physically check x-overs needed to run tools(yes--no)
19 Physically check pump down plug/plugs size (yes -- no) Compatible with customers drill pipe (yes -- no)
20 Does plug(s) fit liner wiper plug(s) and/or landing collar? (yes -- no)
21 Physically check liner wiper plug/plugs size _____ ID _____
22 Will plug/plugs pass thru all accessories in liner string (yes -- no)
23 Physically check setting ball size _____ type (bronze, kirksite, bake-lite, Rogers)
24 Physically check setting ball in Type II landing collar (yes -- no) Ball seat ID _____
25 Physically check x-over bushings or x-over Jts. for compatability with liner (yes -- no)
26 Physically check landing collar, float collar and shoe for compatible with liner (yes -- no)
27 Physically check all your equipment for damages (yes -- no)
28 Will RS/PBR packoff come back thru ZXP packer and/or liner hanger (see warehouse drawing) (yes -- no)
29 What is the effective stroke of the packer setting dog sub _____ ft.
30 What is the effective stroke of the slick stinger ____ ft.
31 What is the effective stroke of the sleeve/pbr pack off _____ ft.
32 Physically check plug dropping head and accessories threads (yes -- no) compatible with customers pipe (yes -- no)
33 Physically check lift nipple for proper od (yes -- no)
34 Physically check low torque valve operate freely (yes --no)
35 Physically check wheel valve (yes -- no)
36 Physically check swivel turns freely (yes -- no)
37 Physically check hammer unions are tight (yes -- no)
38 Physically check flag sub trigger operation (yes -- no)
39 Physically check ball dropping sub operation (yes -- no)
40 Physically check T. D. head operation (yes -- no) drop/lock handle (yes -- no) flapper (yes -- no)
41 Did you install pump down plug (yes -- no) if no, inspect to see if plug(s) are installed
42 Physically check the safety bushing for proper threads to liner and drill pipe. (yes -- no)
43 Physically check lift nubbins for proper fit (yes -- no) elevators, (yes -- no) slips (yes -- no)
44 How many turbolators or centralizes is to be used ____ turbolator od. _____ are turbolator right hand _____ left hand____(Note: right hand turbolators can release HR running tool and left hand can release 2-RH & C-2 Running tool.)
45 Was liner pipe drifted (yes -- no) drift size _____
46 Were you on the floor when drill pipe rabbit was dropped (yes -- no) retrieved (yes -- no)
47 Was all the drill pipe , heavy weight , drill collars , x-over subs, jars, etc. to be used, drifted (yes -- no)
48 Give drift OD. ____ ID. ____ length _____
49 Was the wear bushing pulled (yes -- no) if no, bushing ID_____
50 Did you recommend to thread locking the shoe track (yes -- no) was it done (yes -- no)
51 Does drilling mud have LCM (yes -- no) lbs per bbl _____ recommend removing it from the system (yes -- no)
52 Does float shoe or self filling float equipment operate properly (yes-no)
53 After picking up hanger assembly was drill pipe wiper rubber installed on drill pipe (yes -- no)
54 Was PalMix installed in the sleeve?_____Is the pack-off below the running tool?_____
55 Did "YOU" drop the ball and pump down plug? (yes-no) If no, explain._____
56 Did you make all calculations necessary to achieve a successful job (yes -- no)
57 Were you on the rig floor when the setting tool was pulled thru table (yes-no) if no, explain_____
58 Was setting tool complete when pulled (yes -- no) any damage (yes -- no) if yes explain
59 Was service. breaks made at all tool joint connection of setting tool and head assembles (yes -- no)
60 Was shear indicator sheared on rotating dog sub (yes -- no)
61 Was all equipment put back in basket and inv. checked by you and clearly mark for return to the district

Comments:_____

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1 & 2 You have to know the exact size, weight, grade, thread and ID of the liner casing in order to ensure your hanger assembly will make up properly and fit in the well. It is also critical for your workbook calculations.

3. LCM is mostly a problem for small diameter liners. It can plug the hole in your LWP and the 1st time you circulate through the pipe, you will shear the plug. It can foul and plug up your floats and plug the hole in your landing collar or disable auto fill float equipment. Try to get the Co. Rep. to shake it out of at least enough fluid to fill the liner and drill pipe while going in the hole, and hold this fluid in an isolated pit.

4. Caliper the ID of the liner string to make sure that it agrees with what the customer tells you for Questions 4 and 5. Match the liner thread with the float equipment.

5&6. It is advantageous as a service hand to be involved in measuring of the liner pipe. This is not always possible, but it is absolutely critical to get the liner tally and calculate the liner length yourself. Always ask for the original, hand-written tally if it is available. Many rigs now use a computer-generated tally that adds up all the figures the driller puts in, but it doesn't know if any information is keyed in wrong. Most drillers didn't get their position by typing on a keyboard, so it is always best to do it the old-fashioned way to make sure it is correct.

7. Get with the company rep and find out how many turbolators will be run. Find out if their going to be floating (not set screwed to the pipe) or not. Physically check to see if they have RIGHT or LEFT hand vanes. If they are all RIGHT hand, discourage their use if will be running the liner with an HR setting tool. Right hand turbolators locked on the pipe can produce left hand torque that can mechanically release the HR tool. If they are LEFT hand turbolators locked to the pipe, discourage their use if your running the liner with a C-2 or 2-RH running tool. They can release the setting tool. Discourage reciprocating the pipe while circulating, even if you have the proper turbolators. Upward hydraulic forces can put your setting tool in

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neutral and, when moving up the hole, now the turbolator is going in the direction to possibly release the running tool. ALWAYS KEEP THE DRILL PIPE FULL!!! Never allow a differential pressure in favor of the annulus great enough to lift the liner & put it in neutral at the running tool. Doing so with turbolators is just asking for trouble!

8. Count the total number of liner casing joints on location, and make note of any pup joints to know exactly how many your starting with. Count the remaining joints again after the last joint you figured in the tally is picked up. Subtract the number of remaining joints from the total you counted earlier to ensure the proper length figured in your tally are now in the well. This same check applies to the drill pipe calculation discussed in Question 3 of the checklist.

9&10. There is a milled slot on the pin end of each joint of drill pipe. In this slot, there is a letter and number stamped which designates the grade and weight of the pipe. Refer to your Tech Facts book, Section 2, Page 10 to determine the grade and weight for the information stamped in the slot. Be sure to check this information yourself rather than relying on what someone else tells you. Your displacement calculations rely upon this information and you will be blamed for miscalculations even if you were told the wrong information.

11. Counting for yourself and recording exactly how many joints of drill pipe are on location for the size you will be running allows you to determine exactly how many are in the hole if you encounter any depth problems later in the job. If a joint is laid down or picked up without your knowledge and you tag shallow or deep, you will be able to quickly verify the number in the hole. This also affects your displacement.

12. Most of the time size and cone OD will be all you can physically check. Check the others if possible. If there is a problem, alert the customer and the district so that you can change the hanger out if it doesn't meet customer criteria. Performing all your checks well in advance of the job allow you to avoid costs to BOT and elevates your customer's confidence in your abilities during the rest of the job.

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Don't wait to find problems later.

13. On Mechanical Hangers always check the operation of the "J" cage. If it doesn't operate properly or if there is anything wrong with it, the cage might need to be field repaired or sent back to the warehouse for replacement. Again, caught soon enough, direct cost to BOT for this type of problem will be negligible. If not caught until picking up the hanger on the floor, the penalties will be high.

14. You should make it a point to be familiar with shear pin sizes for your equipment. Carry a few pins of every size in your briefcase, along with some set screws too. Calculate what the pressure to shear the hanger will be and record it. Calculate the number of pins X shear force per pin and divide this number by piston area from your tech unit to determine the hanger shear in PSI. Don't rely on warehouse drawings or Houston tag ("red" w/actual shear.) Pins could have been taken out or some added. Check it yourself and be sure!

15. Just as in Question 14, check the number of pins and multiply by the shear force per pin to determine the amount of force that you will need to apply to shear and set the packer.

16. Check the OD of the tie-back extension before the job. Check the ID after the hook-up has been picked up and before setting the slips on the handling pup. Calculate the burst of the extension (OD - ID X Yield divided by OD) or look it up. Collapse is somewhat more difficult. You must know how far down inside the sleeve, your packoff bushing is, and even then all you can get is a ballpark figure. You should always get this information from the liner workbook or have a region engineer calculate the collapse of the extension, with the pack off 1-2' inside the top of the extension.

17. Remove thread protectors from both ends of the hanger. Shine a flashlight inside the top end of the running tool to ensure nothing has been left inside at the warehouse or put inside by someone at the rig, such as a rag or other item that could cause problems in the well. This hook up has been there several days and you won't be sure until you look.

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18&19. Make sure the connections on the setting tool or any cross overs are correct and in were not damaged in transit.

20. Check the OD of the plug(s) and make sure they will fit through the smallest ID in the run-in string. Check the fin size and make sure they will wipe drill pipe being used (both strings, if a mixed string of drill pipe is to be used). If a single plug method will be used to wipe the drill pipe and the liner, be sure it will wipe the drill pipe, go through the running tool and wipe the liner.

21&22. If possible, check the ID of liner wiper plug to be sure it is large enough for the pump down plug to latch into it. If it's a slim hole or single plug method, make sure the landing collar will catch the pump down plug and seal off.

23. It's not a common practice for a customer to run a landing nipple in the liner string or anything else with a reduced ID. But it does happen, and if it does happen, call the Region Engineer and be sure the plug supplied for this application will pass the restriction.

24&25. Make sure the ball you're using is the proper size for the Type II landing collar you're using. Measure it and try it in the seat of the landing collar prior to the job. Make sure this ball will pass thru the liner wiper plug and get to the landing collar. Think about the job you will be running and consider things such as the specific gravity of the ball, the deviation of the well and the fluid weight to be sure they are all compatible. Carry several balls of different sizes and specific gravity's with you to be ready for unexpected changes.

26&27. There are a couple of ways to know if this equipment is the same thread as the liner pipe. The best way, but not always feasible, is to physically screw these things to the liner pipe. If this is cannot be done safely, caliper the ID of the equipment and compare it to the liner pipe ID, then measure the length of the pin from the shoulder to the end of the pin on the pipe and on your equipment (premium threaded pipe). These measurements should be the same. It helps to have the technical data for

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the thread in question. It is always a good idea to acquire thread books, when you get them, and keep them in your briefcase.

28. Check all the threads. Check the element and slips on the liner top packer. Check the slips and slip straps. Check the set screws in the slips, straps and hydraulic cylinder. Check the pump down plug. Check surface equipment, drop/lock handles, flag sub trigger, ball drop handle, seals on tieback stem. You get the idea! Just look for any problems.

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29. Look for any problems and make sure the threads are compatible.

30,31,32, 33,34& 35. LC Heads only: Make sure the lift nipple fits the elevators on the rig. Make sure the valves work freely. If they don't, try grease from the rig floor. Remember you're going to be hanging in the air on a winch line trying to turn the valves and you have a lot less leverage up there than you do with your feet planted on the ground. To check wheel valve, look down inside to see the stem across the ID of the head, turn the wheel out as far as it will go. Look inside and make sure the stem has retracted into the body of the head all the way. Turn the wheel in all the way and check that the stem has covered the ID. This is a good time to check the trigger on your flag sub, basically the same procedure as the wheel valve check. Get a 36 and turn the lower stem to ensure it will rotate. If it's stiff or won't turn, try grease. If they don't rotate, the job of making up the head and releasing your liner will be very difficult. Get a hammer and check the hammer unions. It's possible you'll be doing it 30 feet up in the air during the job. Plus the rig crew is going to be upset because you got their nice derrick and rig all muddy. The plug is now ready to install! Do not load the plug in any head until it's been check out thoroughly. You don't want your only plug loaded in a damaged plug dropping head.

35. The operation & loading procedure is outlined in your tech unit. Read it & understand it!

36. The standard practice in the region is for all TD Heads to be sent to the job with the plug already installed. If it is installed, DO NOT turn the handle or work the cage. You should get a bar and lightly tap the top of the plug to be sure the cage is locked in place. If you did not install plug(s), look inside the top end to ensure the plug is there. If it's a 2 plug head, look inside from the bottom end also. You should be able to see the lower plug. If it's a 2 plug head and only 1 plug installed (top side), make sure the bottom cage is tripped open and top cage is locked. If it's installed in the lower cage, trip the top cage open and ensure bottom cage is locked closed. By all means know which one the plug is in, so that you manipulate the proper lock / drop handle when dropping the plug.

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37. Keep one step ahead and check out all the equipment.

38. There are those who will say "This is none of my concern." If you weren't running liners for Baker, you would be right. Working for Baker, you are expected to be professional and go the extra mile for your customer. Anything that you can catch, to keep from shutting down the rig, makes you look professional. Your job will go much smoother when the company rep's comfort level with you raises a notch or two. The elevator check is a safety issue. There has been several people over the years who were severely injured or killed because the elevators were the wrong size and the first joint fell out of the elevators. Remember where you will be standing when the first joint of liner is picked up!

39. Using the information you gathered from Question 12, look up the hanging capacity for this particular hanger in the tech unit. Review your liner workbook and calculate the loads the hanger will see during the job to be sure that you will not be getting close to exceeding the capacity of the hanger during the job. If the hanging capacity is not adequate for the job, you may need to change out the hanger for one that will support more load or discuss other options with the customer. Don't forget the ZXP setting force if one is being used.

40. This is very basic, but it can easily be overlooked if you don't take the time to "think" the job through completely. Make sure you don't overlook the obvious.

41,42,43 & 44. This is only possible with a good warehouse drawing. The components of the running tool should be drawn in order of sequence and numbered. If this is not being done, tell your lead coordinator and something will be done about it. Make sure that anything that may have been stabbed from the bottom of the hook up is small enough to go through the ID of everything above it when you pull it out of the liner top during the job.

45,46, & 47. If the pipe was drifted, ask what OD drift was used and check it yourself if possible. The rig may not have the proper size drift and may be using one that won't ensure your tools will pass. If this happens, it will need to be

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drifted again. This shouldn't take any extra time or man power if it's drifted while the pipe is picked up. If the rabbit was dropped prior to you getting to the location, find out if they pulled any pipe before it was dropped. It may be necessary to rabbit a few stands from the derrick. If you are there when the rabbit is to be dropped, be on the floor so you know exactly when it was dropped. Be on the floor a few stands before the rig crew gets to the drilling bottom hole assembly and stay there until the rabbit is retrieved. If the pipe has to be rabbited in the derrick, it is advantageous for you to be on the floor while going in the hole, to ensure the rabbit goes thru every stand. If this is not possible, put an identifying mark on your rabbit. If in your absence a rig crew looses it ,they might get another one and never tell you about it. Keep up with and know your rabbits. Rabbiting the pipe is to ensure your plug will go thru their pipe, you are responsible for this process. Don't be only as good as the driller and his hands.

48. There are some bushings out there that are too small for your hanger/packer to go through. At least ask the ID of the bushing in order to get someone thinking about it. If you can't get good enough answer, have them pull it prior to running your equipment through the rotary.

49. If the shoe track is not thread locked, these connections could potentially back off when the float equipment is drilled out. The bit will be rotating to the right, which is trying to turn the collar or shoe to the right. To the connections above the collar or shoe, this is left hand torque. Make sure the company rep understands why it needs to be thread locked.

50. Before running pipe, make sure the hole is full. Check the float equipment by pumping through the floats after they have been made up and run in the hole, or fill the pipe with the fill up hose, then pick up the pipe 30-60 feet and lower it back down. When you look inside the pipe, the fluid level should have dropped. If you are running auto fill equipment, look in the pipe and you should be able to see the fluid after running each joint. Have the rig crew or yourself check every few stands of DP to make sure the auto fill is working properly. Do not run all the way in the hole with the drill pipe dry. You will collapse something or you could possibly lose the liner when the liner floats the setting tool into the

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neutral position. If it's conventional float equipment, make sure the pipe takes the proper amount of fluid when filling. If it is not taking the right amount, either your floats or your liner packoff could be leaking.

51. Once you have put your hanger assembly through the rotary, protect the hole with a stripper rubber WITHOUT EXCEPTION! If the rig crew loses something in the hole, it is not likely that they will tell you. When something goes wrong, your hanger or packer is going to be blamed. Without exception! It is just as important on every trip in the hole after the hanger is set and cemented.

52. Pal Mix is a debris barrier that is put into the sleeve to keep well cuttings from getting around the running tool and prevent you from releasing the running tool. It is to be used on every job where the liner packoff is below the running tool (HR, 2-RH, C-2). It is even a good idea to use it with sleeve pack-off's to protect the packer setting dog sub when it is run above the packoff.

53. Make it a standard practice on all your jobs to operate the valves yourself whenever your are dropping a ball or plug (even if you have to argue with tool pushers and company reps). Don't let a rough neck near that head assembly after it's picked up. Making this a standard practice will reduce the possibility of having plug problems during the job.

54. Calculate the following:

Tensile Loads of everything in the well and identify the weakest link.
Annular Volume: DP vs. Casing, DP vs. Intermediate Liner, Liner vs. Open Hole.
Height of Cement which may cause a differential pressure affecting the ball seat shear out, hanger shear, or release of H.R. tool.
Capacity: Drill Pipe string, Liner to the LC, and Shoe Track.
Weight of the String in Mud: Drill Pipe and Liner - Remember to consider the block weight.
Stretch of the Drill Pipe due to the weight of the liner (in feet).
Piston Force acting to push your seal assembly out with no slack off weight on the hanger.

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Total Slack-Off (in feet) considering stretch of the drill pipe and desired slack off weight to keep the seals from pumping completely out.

Depths: TD (total depth), Top of Liner after setting, Amount of Overlap, Depth when shoe enters intermediate liner top, Intermediate casing / liner Shoe, Depth when the hanger will enter intermediate liner top, and Depth when the shoe will tag TD. Don't forget to consider your bumper sub stroke.

Pumping Volumes: When Spacer reaches the Shoe, When Cement reaches the Shoe, When LWP(s) shear, When LWP(s) latch,

Load on Hanger: With test pressure on the plug, With pressure on the annulus and seals in, With pressure on annulus or down D.P. with seals out.

Torque vs. Rounds: for mechanical release of HR Setting Tool

55,56,57, 58&59. Self Explanatory!