PRECISION

Keeping You Connected.

SEMI PREMIUMCONNECTIONS

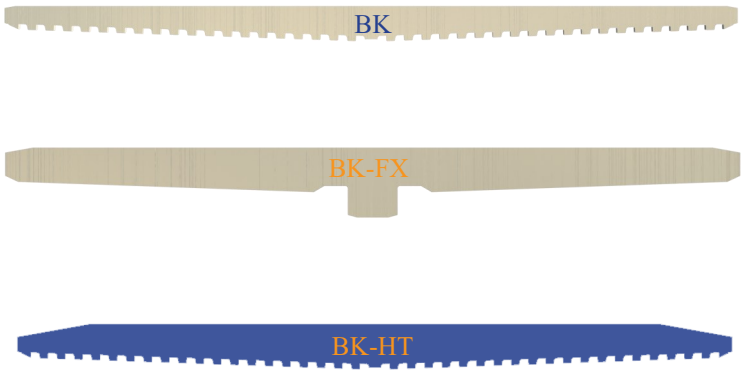
FIELD TESTED. FIELD PROVEN.

BK Running Procedures

February 27, 2020 V5

BK Description:

The BK is a threaded and coupled connection that relies on pin nose to pin nose contact to transmit torque and improve sealing capacity. The BK uses the 5 pitch API buttress thread which makes it interchangeable with equipment manufactured to current API standards. Currently the BK is manufactured in sizes from 4.5" to 13-3/8". The couplings are interchangeable between the various weights for a specific pipe size. Torque ratings vary by size, weight and grade because torque is affected by the pin nose thickness, area and strength of the steel. The primary job of the coupling is to join the pipe and provide sealing. The BK relies on proper centering of the pin nose in the coupling to maximize sealing.



Sales

Phone: (832) 799-7414

Technical Support

Phone: (832) 405-3711
mike.nations@precision-llc.com

Precision Couplings,

11200 Mesa Drive
Houston, Texas 77078
Phone: (713) 678-8900

https://precision-llc.com/

Information Technology Solutions

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Thread Representatives and Torque Turn Monitoring

Precision recommends the use of torque turn monitoring and thread representatives. We believe that it is important to use people who have a considerable expertise in running threads. It is basically cheap insurance since there are so many small details that can derail a good completion. We recommend that if you do not wish to use thread representatives on an ongoing basis that you consider having them out for the first few jobs. They can train and pass on technical and logistical information to your crew. Each rig is different and we have found that thread representatives can help optimize a solution; typically before game day.

Typical service includes the following:

- Assembly Makeup and Testing
- Verify accessories size, weight, grade, and connection type match schematic specifications
- Perform a complete Visual Thread Inspection (VTI) prior to prepping the connections
- Verify load cells are properly calibrated prior to initial make-up
- Verify torque turn graphs meet manufacturers' criteria for the connection
- Drift assemblies prior to and after make-up to verify connection and tube integrity
- Verify all testing equipment is within calibration and test pressures meet specifications
- Confirm test charts are within tolerances
- Install clean thread protectors and tag for shipping

A complete list of qualified thread representatives are listed on our website.
https://precision-llc.com/thread-representatives/

Torque Turn Monitoring

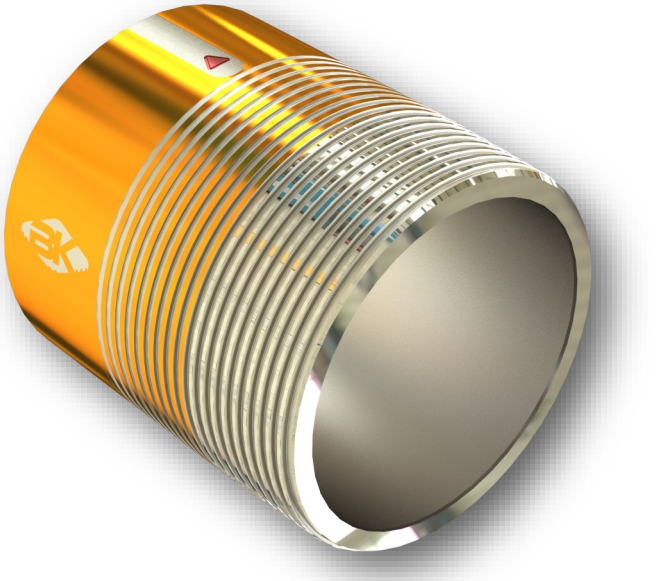
Monitoring make up torques will help identify good and bad connection makeups and ensure maximum seal-ability.
Data sheets for the BK products can be found on the web at: **https://precision-llc.com/bk-semi-premium-connection/**

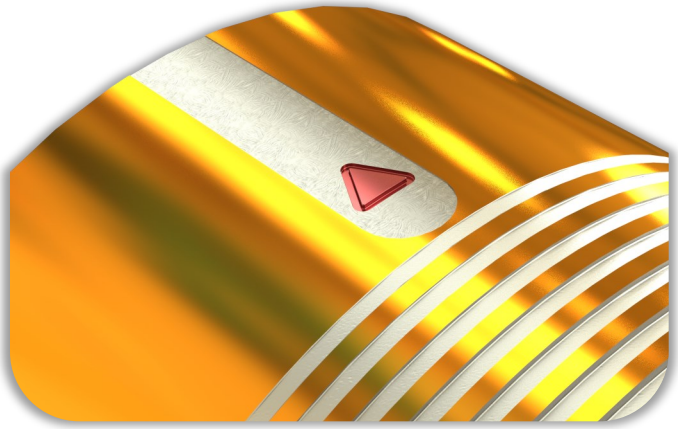
- **Identifies connection shoulder which prevents cross-threaded joints from being run in hole.**
- **Identifies high and no shouldering which can be an indication of an alignment issue.**
- **Can identify galling or rough make ups from debris or thread damage.**

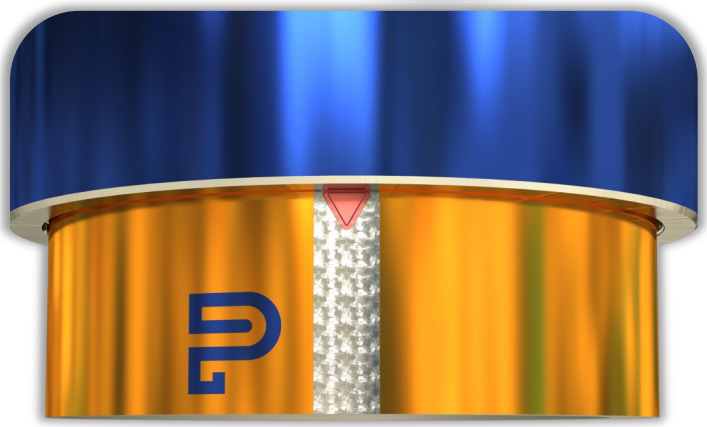
Coupling Centering

API pins are marked with a triangle stamp on the outer diameter of the pipe. Typically this triangle location is further emphasized by a white paint line. The BK coupling face will be at the base of the triangle. If the pipe is not properly marked a table is provided with the straight line distance as measured from the pin nose. The overall length of the coupling is twice the distance to the base of the triangle. There is a small length tolerance (.032") on the coupling but it is too small to be discerned in the field. When fully made up the base of both triangle stamps should be on edge with the coupling face.

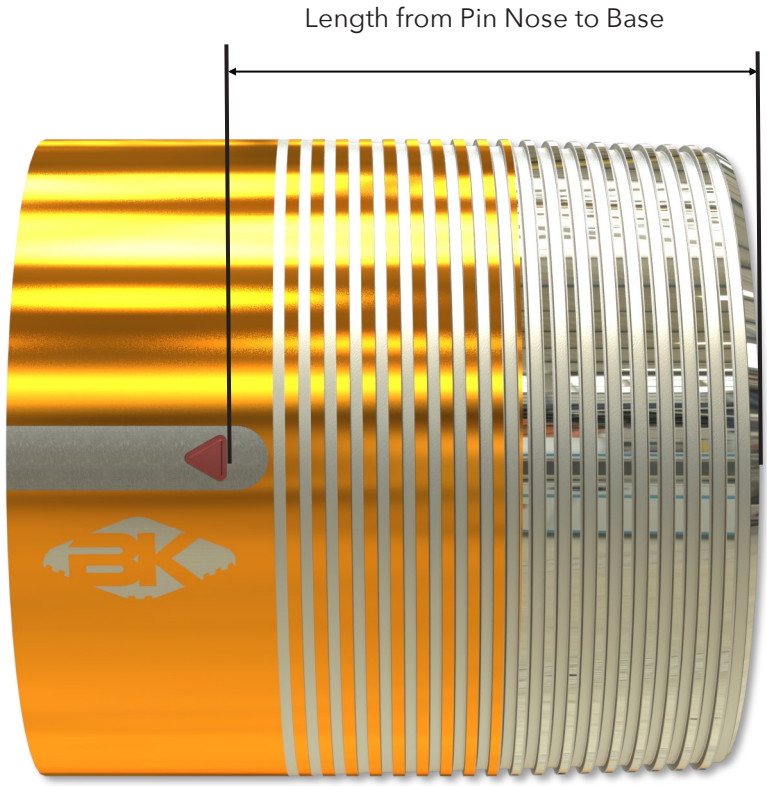
The face of the coupling should not be buried deeper than half the triangle height from its base. Nor should it be offset from the coupling face by the same amount (3/16 inch). In laymen's terms this is nearly a full turn.







Coupling Centering Reference Material



The BK Coupling Length is twice the length of the distance from the pin nose to the base of the triangle stamp.

In cases where there is a loose coupling and a triangle stamp is missing or not well formed, this can be used as a guide to centering.

Pipe Size	Triangle Stamp Base to Pin Nose	Coupling Length
4 1/2	3 15/16	7 7/8
5	4 1/16	8 1/8
5 1/2	4 1/8	8 1/4
6	4 5/16	8 5/8
6 5/8	4 5/16	8 5/8
7	4 1/2	9
7 5/8	4 11/16	9 3/8
8 5/8	4 13/16	9 5/8
9 5/8	4 13/16	9 5/8
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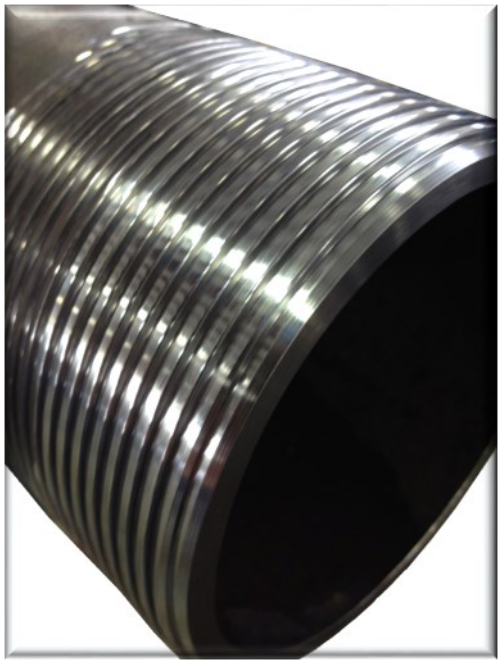
11 3/4	4 13/16	9 5/8
13 3/8	4 13/16	9 5/8



Cleaning and Inspection

If a drift check is to be performed, it should be performed prior to cleaning. A clean drift is recommended for drifting the tubular. Any clevises or chains should also be wrapped with duct tape. Drift direction will be box end to pin end, to prevent trash from the tube being dragged into the box connection.

Check the inside of the tubes for foreign material. If any is present, remove with compressed air.

Before running, the pipe and coupling connections should be cleaned, dried and inspected. If any debris is present thoroughly clean and dry the connections. Do not use diesel as a cleaning solvent. The use of solvents such as Varsol or soap can leave behind a residual film that impairs thread compound from adhering to the connection. In cold weather environments solvents may be necessary because of icing. Bagging connections in cold environments can prevent icing. Cleaning should be done using a hot water pressure washer or steam cleaner with no solvents thereby eliminating the potential for problems. Do not use metallic or wire brushes to clean threads. It can remove the coatings on couplings and is known to cause galling. An air hose with a trigger valve, should be used to dry pin and box connections. If this is not an option then dry clean rags should be used to dry connections.

Threads should be visually inspected for damage that would prohibit their use. The imperfect pin nose and run out threads may appear rough due to an aggressive de-burr which is normal since it is beneficial to remove the sharp edges which can cause galling. Verify the correct mill end Make-up of the coupling. Refer to Coupling Centering.

Threads should never be stored without grease, light oil or a corrosion inhibitor for protracted periods of time. Efforts should be made to insure that the thread protectors are always clean and dry before reinstallation.

Tubular preparation should be limited to quantities that will be run within a reasonable time span, to reduce the possibility of rusting and pitting.

Thread Repair

Minor thread anomalies may be field repaired with scotch brite (Scotch Brite wheels and pads are allowed). The pin noses should be free of damage that would could cause galling such as dings and heavy scratches. When re-running, the pin noses may be repaired as long as the galling can be removed with scotch brite. Grinders are not allowed. After repairs, threads must be re-cleaned and dried.

Joints with irreparable damage should be marked accordingly and set aside. Records should be kept on all repairs or rejects.

The couplings are phosphated to reduce galling. In order to reduce the chance of thread galling after thread repair, the area should be coated with Dry Moly Lube (Molybdenum disulfide aerosol spray preferred).

Pin Thread Profile

BK pipe threads are standard buttress threads and may be gaged using practices outlined in API 5B. The Coupling threads are modified but retain most of the API 5B appearance characteristics.

Threads should never be stored without grease, light oil or a corrosion inhibitor for protracted periods of time.

Efforts should be made to insure that the thread protectors are always clean and dry before reinstallation.

Kluberlub OCTG LF HT, JET-LUBE® RUN-N-SEAL® ECF and Best of Life 2000 are the recommended running compounds and also serve well as storage compounds. For cold weather applications always use an artic grade thread compound. Kluberlub OCTG LF HT & JET-LUBE® RUN-N-SEAL® ECF are recommended for their exceptional high temperature and pressure sealing capabilities. Unless it is otherwise specified by the end user one of these compounds will be used one the mill side of the coupling.

Make Up Preparation

Rig Site Preparation

- The traveling block should be aligned with the well bore.
- Verify that the wear bushing has been pulled or that the I.D. is sufficient to pass all string components.
- Verify that the B.O.P.'s have been fitted with the proper size pipe rams.

Running and Handling Equipment

- All handling equipment should provide maximum protection against tubular damage. In order to do so, all equipment should provide the longest practical or necessary die surface. Non-directional dies are recommended however directional dies are accepted per API 5CT.
- Ensure that the slips are in good working condition, are fitted with the proper size dies, and will accommodate the weight of the string.
- Ensure that the elevators are in good working condition, are fitted with the proper size dies, and setting plate and will accommodate the weight of the string. Do not use bottleneck elevators. Center latch and side door elevators are preferred; however slip grip elevators may also be used.
- The power tongs should be rated for 1-1/2 times the torque that is to be applied. They should be fitted with the proper size and type of dies, and the dies should conform to the curvature of the tubular. **Tongs equipped with an integral hydraulic backup are recommended**. If it is not available, the snub line should be at a 90-degree angle with the tongs and level.
- A calibrated power tong torque gauge should be placed in the snub line. To achieve peak performance the optimum torque applied to the connection being run should be approximately half of the gauge scale. The handle length of the power tongs should match the handle length for the torque gauge. PSI gauges are not suitable for running production tubulars.
- Hand held or integral hydraulic backups should be used. They should be in working order, fitted with the proper size and type of dies, and should be rated for the torque that is to be applied.
- A stabbing board should be utilized to maintain vertical alignment throughout stabbing and make-up. A stabbing yoke may also be used.

Standard Casing Tongs

Power Tong with integral backup

Make Up Preparation

Tubular String Accessories

BK is Buttress compatible. The coupling and pipe pins are interchangeable with API 5B buttress casing 4.5" to 13.375".

It is preferable to make in-string accessories up in assemblies. This can be performed at any assembly makeup facility. The assemblies should be made up to optimum torque utilizing a computerized torque monitoring system. When possible use a torque monitoring system comparable to the one that will be utilized in the field. Verify that the thread compound used on the assemblies is the same compound that will be used on location and that it is adequate for the well conditions. The assemblies should also be full length drifted and pressure tested. This will greatly reduce rig down time and connection damage from problems associated with different ODs and lengths of the accessories.

- All accessories that are to be a part of the tubular string should be located and checked against the string design.
- Any accessories that are not present, or do not conform to the string design should be brought to the attention of the appropriate end user representative.
- All accessories that are similar, yet slightly different, should be noticeably marked to indicate the position that they are to be run in the string.
- All accessories should be drifted if possible. Accessories with restricted I.D.'s may also be drifted if arrangements have been made to have reduced size mandrels present.
- Thoroughly clean and dry all the accessory connections.
- Visually inspect the threads.
- If any connections are threaded and coupled, verify correct mill end make-up.
- Damages that can be field repaired at this time should be.
- Any connections that cannot be field repaired should be marked accordingly. Replacement accessory(s) should be ordered, or the damaged part should be rethreaded, time permitting.
- Clean and dry protectors should be placed back on the connections.

Recommended Accessories:

Stabbing Guide – API BTC
Tool Guides

Typical Accessories:

Float Shoe
Float Collar
Marker joints
CRT running tools
Fill up and circulation tools
Lifting Nubbins
TIW valves

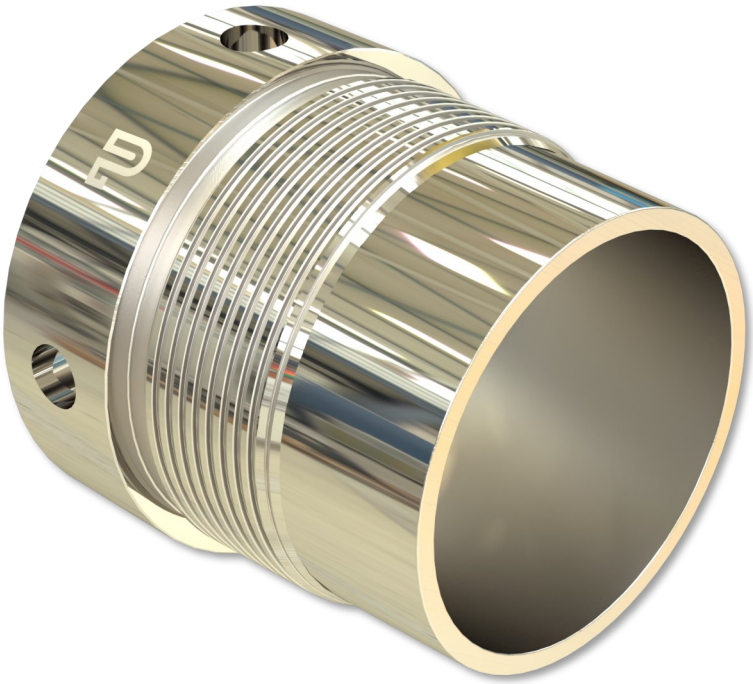
Crossovers
Integral centralizers & reamers
Bottom hole assemblies
Hangars
Bit assemblies
BACE Tools "Buoyancy Assisted Casing Equipment

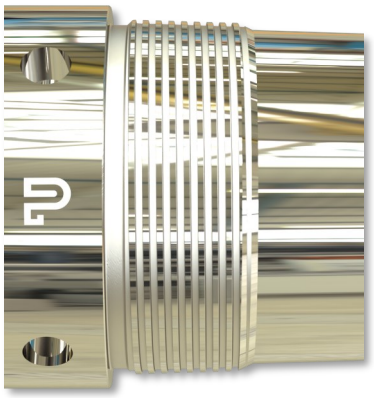
Running with Casing Drive Internal Gripping Tools

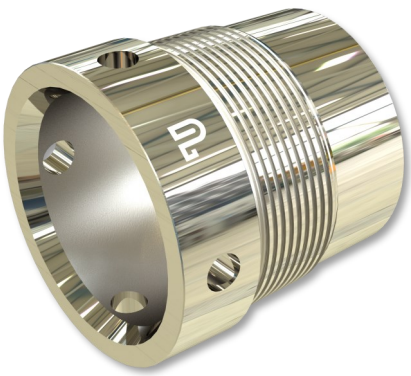
When running with Volant, TorkDrive, Tesco Casing Drive or similar casing running equipment that rotate casing by gripping internally, please use a metal thread protector or tool guide to prevent thread damage. The metal thread protector is sometimes called a Volant box thread protector or handling plug or tool guide. The protector should be driftable to allow the running tool access into the pipe. Note: *Lift Nubbins are designed to handle heavier loads than a protector or a handling plug. A tool guide or handling plug may not be fully threaded because they are made for rapid installation and removal.*

Running With a Weight Compensator

Using a system that has a weight compensator is highly recommended. Thread damage is prevented by neutralizing tool and joint weight during makeup or breakout.







Tool Guide

Running and Pulling Singles

Running

- Gently roll one joint at a time into the pickup trough. Insure that thread protectors are snugly in place prior to doing so. Transport the joint to the rig floor. If a pickup/lay-down unit is not present, transport the tubing to the vee door.
- Remove the box end protector.
- If the tubing is to be rabbited, the rabbit should be placed in the tubing after installation of the handling plug. If the rabbit is not clean, it should be cleaned and dried prior to placing it in the joint. Should the rabbit stop in the tube, it should be broken free by easily pushing or tapping an object from either end. **Do Not** beat or tap the outside or end of the tubing with any hard object. Water may be run behind the rabbit to cause it to fall, but no hard objects can be utilized.
- Attach the pickup line and raise the joint at a moderate speed, for both safety and tubular protection.
- Remove the pin end protector, the rabbit, and inspect/re-inspect the pin end connection.
- If any debris is present, the pin connector should be wiped, or blown clean.
- If applicable, apply thread compound to the pin end connector. Application of thread compound should be controlled and thorough.
- Remove the handling plug from the box end in the rotary.
- If debris is present, the box connection should be wiped, or blown clean.
- If applicable, apply thread compound to the box end connector.
- Place the stabbing guide over the box end connector.
- Slack off of the joint in the pick up line. The joint should be lowered slowly to minimize thread damage.
- The stabber should stab the joint and hold it as close to true vertical as possible at all times. **Note:** He should be advised not to hold the handling plug (if used). Doing so might cause the handling plug to unscrew when turning the tubing.
- Remove the stabbing guide and the pick up line.
- When possible, start the connection by hand and add additional torque using a nylon strap wrench. As a minimum a full turn past stab is usually good enough. This technique can prevent cross-threading.
- Apply the power tongs and begin makeup at no more than five R.P.M.'s. If torque is achieved prematurely, stop makeup immediately and check vertical alignment. Attempt makeup again. If premature torque is still present, back out the
- connection and check for damage. Repair or lay the joint aside and proceed. Tong speed should be slowed to five R.P.M. or less prior to shoulder. The shoulder torque should be verified as acceptable. If a CRT is used for make up, hold torque for at least 10 seconds to ensure full torque transfer to the connection.
- **Note:** Five R.P.M.'s = 12 seconds per rotation

Running and Pulling Singles

Running-Continued

- Remove the power tongs, and if applicable, review the torque turn graph. Back out any connections if the graph indicates a potential problem.
- If testing above the rotary, insert the internal test tool or apply the external test unit. You should not perform this step until **Full** torque has been applied to the connection.
- After full torque has been achieved, latch the elevators as gently as possible, and raise the block at a slow speed. If the block is raised too rapidly, swaging of the tubing may occur.
- Pull the slips and lower the string.
- Stop the downward movement of the string and either set the slips or firmly hold them around the tubing. Assure that the slips are set or are placed correctly and gently set the string weight on the slips. Applying weight too rapidly may swage the tubing.
- Attach the pickup line to the next joint to be run and unlatch the elevators from the last joint run. Hold the elevators far enough away from the joint in the rotary to prevent contact, and raise the block at a moderate speed.
- If the tubing is to be tested below the rotary, insert the internal test tool. To prevent connection damage, leave the handling plug completely made up until the test tool has been removed from the tubing.

Pulling

- Gently latch the elevators around the joint in the rotary, and raise the block at a slow even speed.
- Stop movement of the string and either set the slips or firmly hold them around the tubing. Assure that the slips are set or are placed correctly and gently set the string weight on the slips.
- Unlatch the elevators and raise them above the joint to be backed out.
- Have the stabber hold the joint to be backed out as close to true vertical as possible.
- Apply power tongs and slowly apply torque until the connection breaks. Slowly back out the connection (5 R.P.M.'s) until most of the interference is no longer present. Remove the tongs. Finish back out by hand or strap wrench. Stop when the connection "hops" once.
- Attach the pickup line.
- **Note:** If available, a single joint compensator should be used to reduce the bearing weight applied to the mating threads. This unit should actually be able to float the joint during breakout and have the ability to provide movement needed during thread disengagement.

Running and Pulling Singles

Pulling –Continued

- Latch the stabbing guide around the box end to reduce jump out damage.
- Gently raise the joint. If the connection does not appear to be free, turn counter clockwise one half turns and try to lift again.
- Dope the pin connection thoroughly and install a clean thread protector.
- Slowly set the joint in the vee-door.
- Remove the pickup line and the handling plug.
- Re-install thread protectors and move tubing to racks.

NOTE: If the tubing is to be sent in for inspection and salvaged you must at a minimum rinse the OD & ID and connections with fresh water to remove any corrosive fluids. It is recommended that a pressure washer be used to fully clean the tubulars. (Elevate the tube on the box end slightly to ensure proper drainage).

Thread Compound application "Doping"

Mustache Brush

The BK relies on a good thread compound application to provide maximum sealing. The pipe threads and coupling threads shall be evenly coated on the thread roots and crests. The pin noses must be coated. Generally too much is when the thread roots are more than 1/3 full. Too little is when there is bare metal in the threads. A Mustache Brush like the one in the photo is recommended. (A toilet brush from the bathroom is not). Do not apply a glob on one side and expect the make up to smear the compound evenly! This time honored tradition has been passed down from rig hand to rig hand for generations and is responsible for numerous connection failures. The pin threads may be run coated or uncoated with a well coated coupling and mill end pin nose. Do not ever run with a doped pin and dry coupling.

Running as Tubing: Dope the pin and the box when running the BK as tubing.

It is recommended that boxes be doped on the rack and pins on the rig floor. This is to avoid contaminating the grease on the pins. If the pin is clean then a clean thread protector with no dope should be used when handling the pipe up the vee door. Do not screw a dirty cap onto a freshly doped pin, because this will cause the coupling to turn, shoulder high or no shoulder.

Too much or too little dope will affect the shoulder torque. It is generally a good idea to remain as consistent as possible to get the connections to make up quickly and smoothly.

At all costs avoid getting the grease wet with water. This will slicken up the grease and can cause the connection to yield prematurely. If the dope gets wet while filling the casing, clean, dry and reapply fresh dope!

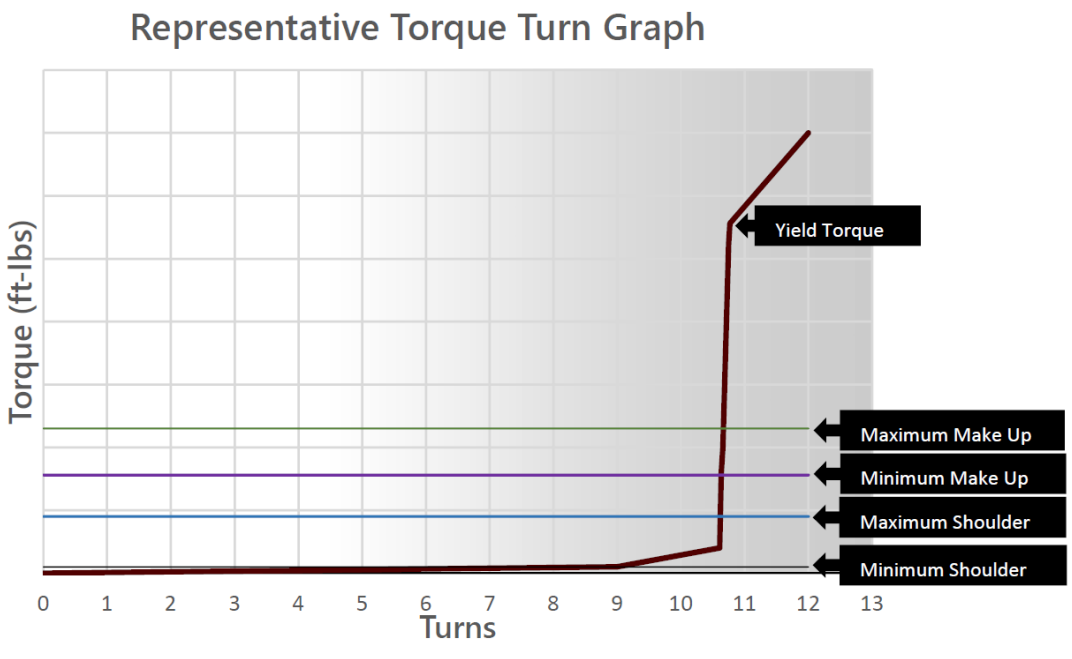
JET-LUBE® RUN-N-SEAL® ECF is highly recommended for temperatures exceeding 200°F and all horizontal wells due to the heat generated from applying high torque. JET-LUBE® RUN-N-SEAL® ECF , Kluberlub OCTG LF HT and Best of Life 2000 are the recommended running compounds. Other proprietary thread compounds may be used that are API Bulletin 5A2 compliant and / or equivalent. Artic grades are recommended for cold weather applications. Green-Seal II Thermal is recommended for high temperature steam injection wells.

Representative Torque Graphs

The following torque graphs are supplied to aid in the running of the BK. The values provided in the technical data sheets are determined by laboratory testing at standard room temperature in a clean environment with perfectly made pipe and perfectly aligned and calibrated tongs. Your conditions will vary, but these guidelines can help to troubleshoot common problems. The graphs depict the full torque profile past yield.

Shoulder Torque: Point on the graph where the torque spikes dramatically when the pin noses make contact.
Yield Torque: Torque that crushes the pin noses. Generates a lot of heat due to friction.
Optimum Make Up Torque: Recommended torque to ensure pressure integrity, breakout capability and structural stability. The value is between Minimum and Maximum Make Up Torque.
Minimum Make Up Torque: Lowest recommended assembly torque.
Maximum Make Up Torque: Highest recommended assembly torque. Exceeding this value can make it difficult to re-run the connection if the casing string must be tripped out. It is best to leave the connection together if this value is only slightly exceeded. Represents 75% of the yield torque.
Operating Torque: Maximum torque when rotating a casing string under load. Represents 85% of yield torque and great care should be taken before making a decision to approach this value. Operating at 75% of yield torque or below is recommended. Consider it a 10% field safety factor. It will be difficult or impossible to break out connections that are run to extreme torques. Breaking out connections run at high torque will cause galling of the pin noses.

Maximum Make Up Speed: 40 RPM up to 8.625" pipe. 25 RPM for pipe 8.625" and larger.
Make up start speed: 5 RPM recommended until proper thread engagement
Make up end speed: 10 RPM or less recommended to get a good shoulder & graph.



Representative Torque Graphs

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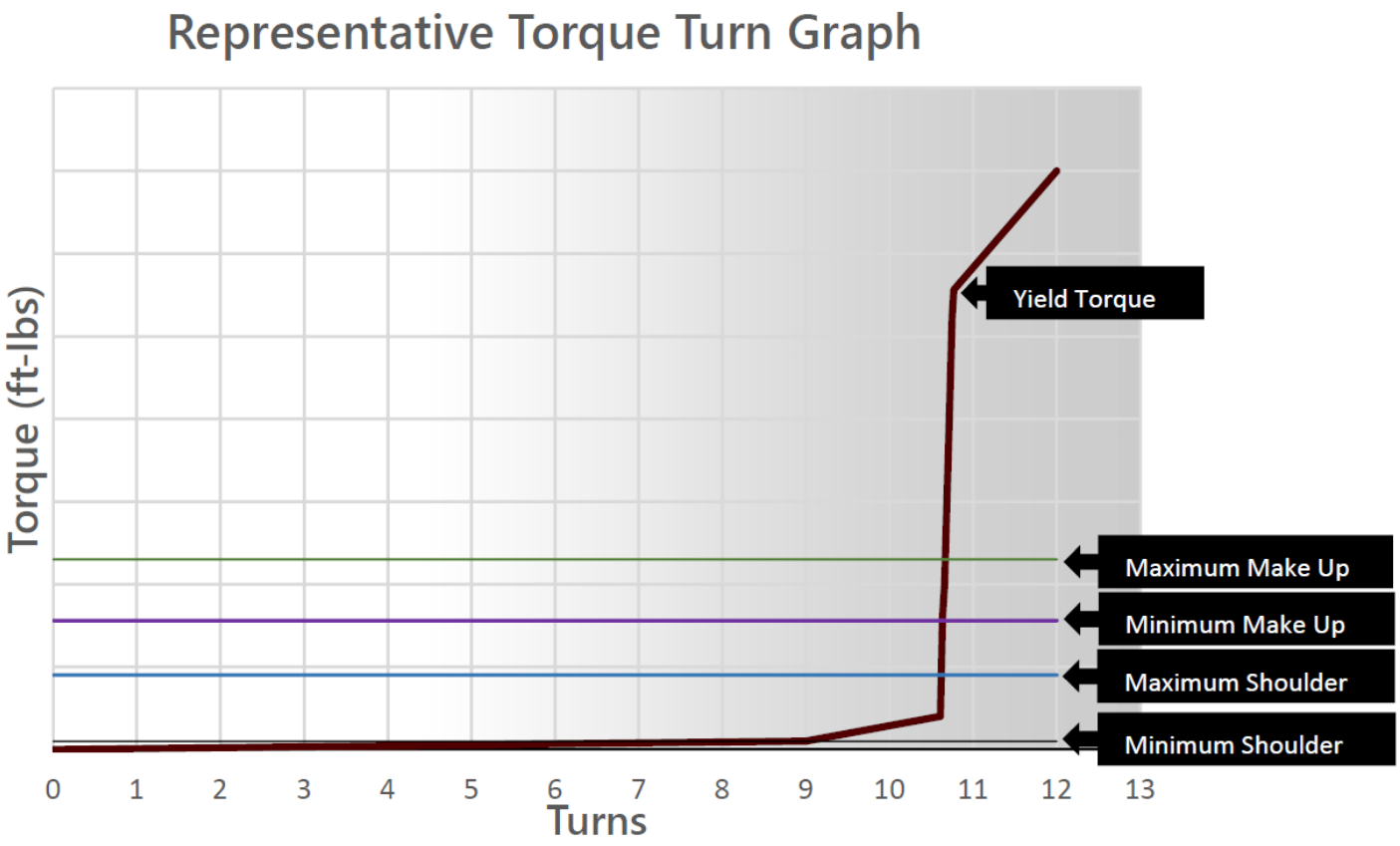
Normal Make Up Graph

The shoulder is expected to occur before the minimum make up torque. Adhering to the minimum, optimum and maximum makeup torques will give the best sealing and ability to trip out the connection easily.



High or Low Shoulder Torque

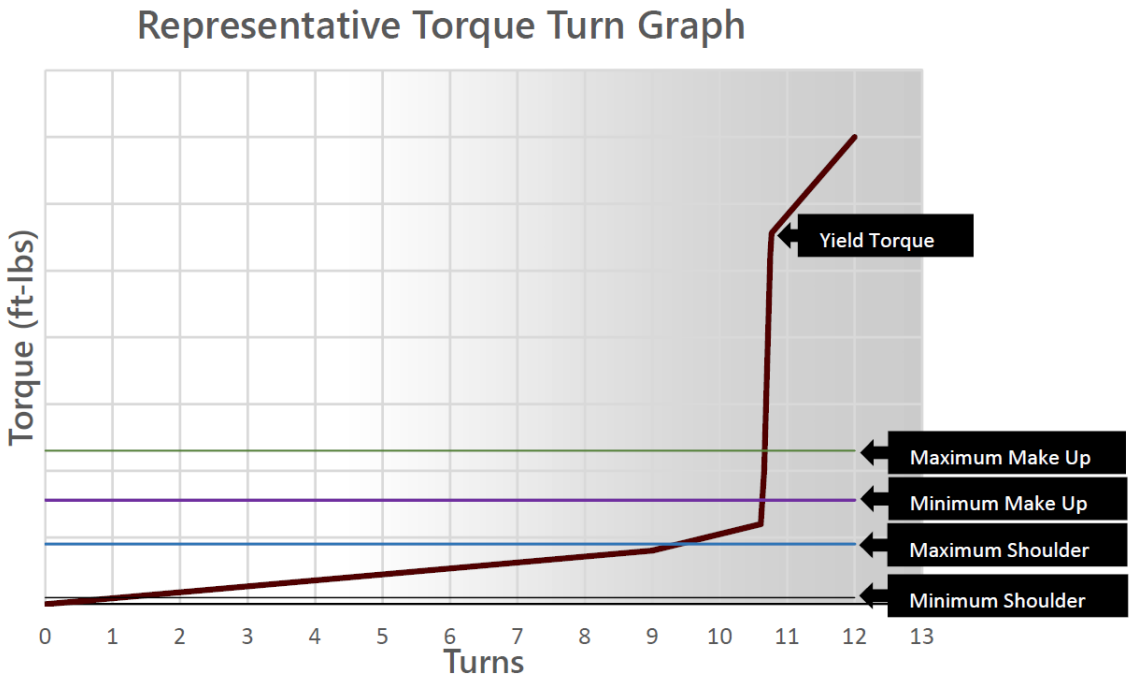
The shoulder is expected to occur before minimum make up torque. It should shoulder before it reaches 80% of the minimum make up torque to achieve proper delta torque. Under no circumstances should the shoulder occur above the minimum makeup torque. Under no circumstances shall a connection have a ***no shoulder or a zero torque shoulder***. The connections should be broken out, cleaned and inspected in order to determine if it should be re-run or laid out. Generally most high shoulders are from improper slack off. In the instance of an abnormal shoulder, check that the coupling has not turned and is in the proper position by triangle stamp.

Possible High Shoulder Causes:

- Pipe to coupling alignment
- Too much / Too Little Thread compound
- Contaminated thread compound
- Cold or hot temperature affecting thread compound viscosity
- Gripping the coupling too tight
- Turning past the coupling center position—Check triangle stamp
- Galled threads

Possible Low Shoulder Causes:

- Too much / Too Little Thread compound
- Contaminated or slicked up thread compounds. Threads that are wet from rain or fluids when the compound is added. Cold or hot temperature affecting thread compound viscosity
- Mill end past the coupling center position—Check triangle stamp.
- Improperly heat treated material on the coupling or pin.
- Bad pitch diameter on the coupling or pin. Check if pin runout threads are very far past the triangle.
- Manufacturing defects in the thread

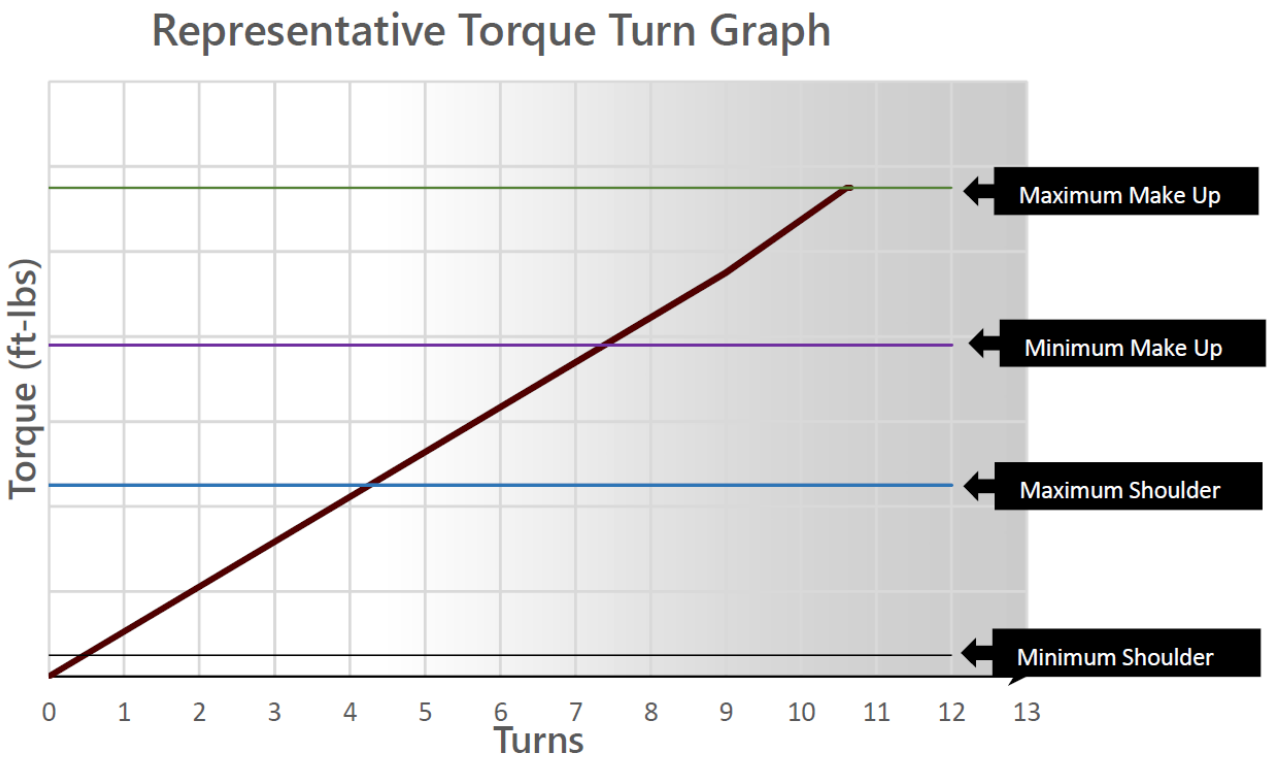


Cross Threading

When cross threading occurs the torque graph can have the appearance of a sloped line. The graph lacks a definitive shoulder at the expected shoulder and can exceed the max makeup torque.

Possible Causes:

- Pipe to coupling alignment
- Too much pipe weight on threads when stabbing
- Connection rocking from: high rpm make up, bent pipe, pipe alignment or rig alignment.



Running Torque & Rotation

The BK is a true drilling with casing connection and is designed for high RPM rotation and reciprocation.

RPM Limitation. It is recommended that 100 RPM be the upper limit especially for doglegs greater than 25° / 100ft. This will keep the fatigue low enough to finish a well in the shale plays. For drilling with casing in vertical wells (Less than 6°/100ft) this limit does not apply. Fatigue is your worst enemy and it comes from the stress reversals through the bend. The less time each joint spends in that zone the better. Tests have shown that 80 to 90 RPM generates a sufficient fluid vortex and decreases side loading friction enough to advance the pipe. Think of the fluid vortex as a tornado that suspends debris that piles up ahead of the casing and around the couplings. RPM is your friend when trying to advance pipe even though most folks think it's torque. It's better to be advancing slowly under high RPM and low torque than low RPM and high torque. The RPM limitation rules apply generally for 4.5" to 7" pipe. Pipe larger than 7" is not typically used in doglegs in the shale plays.

Torque Application & Downhole Makeup. It is not recommended to apply the maximum operating torque during buck on. Downhole makeup is better for several reasons. The pipe is not marred or swaged by the tongs. Torque generates heat and the coupling is generally surrounded by fluid which keeps the connection cool. Downhole make up is more gradual and only the connections at the surface will see the highest torque (torque dissipates the further away you are from the source.) The couplings going through the bend will have lower makeup stress and flexibility. Instead of stressing every connection you only stress a few. Staying within the min and max makeup torques allows the connections to be broken apart (tripped out) and run again. When applying a higher torque at makeup the connection threads and pin noses can be damaged on break out. Higher torque forces the grease out so that when you back out there is little lubrication. The direction of the galling usually indicates this is the case. The final reason is that it is easier to trip out without a powerful tong (logistical nightmare).

Torque Application & RPM. It is recommended that torque be applied gradually as well as RPM. A gradual downhole makeup is preferred versus the impact type forces that result from rapid torque applications or rotational acceleration. There is little advantage and a whole lot of downside. The speed and torque to be applied will differ with the depth of the well since you would be winding up a lot more pipe. The torsion will twist the pipe and it's better to let it wind and unwind slowly downhole.

Reciprocation. Reciprocating the pipe is recommended to aid advancement as long as the pull is below the connection minimum yield. Reciprocating, Rotating and Circulating are the best ways to make bottom. Reciprocation should be gradual to minimize impulse / shock loads. The BK has superior structural integrity and can take larger compressive and tension loads than API Buttress. One word of warning though; Do not exceed the connection yield in pull, some people use the API Joint strength or thread strength. That is the tensile value and you may get one good pull before the joint parts. In any case pulling to this number permanently deforms and weakens the steel. A piece of steel that has been pulled past yield will experience accelerated corrosion downhole.

Running Torque and Rotation

Maximum Operating Torque. The maximum operating torque is defined as 85% of the yield torque. When making up to maximum torque on the rig floor is required this is also the upper limit. Making up beyond maximum operating torque is not permitted and both affected joints should be rejected. At yield torque the pin noses begin to buckle and generate substantial heat. The couplings can get as hot as a broiler. (450 degrees F in air). Buckling the pin nose can cause a no drift situation, a split coupling, a part or simply affect pressure integrity. Parting and splitting are examples of extreme over-torque. Using 85% of yield has proven to prevent all over-torque failures. It gives an ample safety margin for errors in top drive and torque sub torque readings, differences in thread compounds and temperature variations. It does not compensate for wet threads or altered thread compounds. If the threads get wet while filling the casing, from rain etc.. , please clean dry and reapply thread compound. If you know the threads have been wet then cut the max operating torque to 66% of the yield torque. It will be difficult or impossible to break out connections that are run to extreme torques. Breaking out connections run at high torque will cause galling of the pin noses. Break out galling typically begins to occur when the torque applied is 60% of the yield torque. This is because typical thread compounds break down when the contact pressure is too high. The grease will also extrude from the contact area and there will be little lubrication when the connection is broken out. The pin noses can be redressed with scotch bright in most cases.

Yield Torque. This is the torque at which the pin nose buckles. This is a lab tested value using proper thread compound under ideal temperatures and cleanliness with known steel yield strength. Exceeding this value will lead to pin nose buckling. No guarantees are made regarding seal-ability, drift ability or joint strength.

Make up Speed. The max make up speed is influenced by rig alignment, pipe size, straightness, weight, type of tongs, pipe rocking, heat etc… A general guideline of 20 RPM was published by API because failures did not generally occur below this speed. Precision Connections realizes that a quick installation is desired and we will stand by our speed rating as long as the connection is not cross threaded or damaged by excessive make up speed. The max rating is 40 RPM up to 8.625” pipe and 25 RPM for pipe 8.625” and larger. The connection should be started at 5 RPM and the last turn should be at 10 RPM or less to get a good torque graph. It is recognized that some tongs require that they be started in high gear. 5 RPM start and 10 RPM finish are recommendations.

Optimum Torque. Torque that guarantees optimal sealing at the lowest stress. Higher make ups stretch the coupling and compress the pin nose. It also makes the connection more rigid which increases the coupling stress under bending loads. Optimum torque allows the connection to be easily broken out , tripped out and re-assembled.

Troubleshooting

Coupling Turning

Coupling turning is the biggest drawback to running pin nose to pin nose connectors and connectors with torque rings. The BK has an anti rotation feature that helps keep the coupling from turning more than 1/2 turn or approximately 1/8". API Buttress couplings are allowed to turn during makeup which makes them easier to run, but it is one of the major causes of their failure since this leads to them splitting. With a little effort and experience it can be nearly eliminated.

A small amount of coupling turning can occur especially at the last turn and a half. If the turning is minimal continue with the makeup without stopping. A line can be scribed on the coupling and pipe to determine the amount. Turning of less than 1/4 turn is of little concern. Corrective steps should be taken to remedy the situation if turning is 1/2 turn or persistent on subsequent make ups.

Pipe to coupling alignment. Couplings can turn when the alignment of the pin and box is mismatched. This causes side loading of the threads. This is a typical complaint regarding pin nose to pin nose connections but it can be remedied by controlling rig vertical alignment and top drive / elevator alignment with the rotary table.

Cross Threading. Couplings can turn if the connection is cross threaded or thread locked. Thread locking occurs when the weight of the pipe causes a misalignment which allows the thread crests to ride on top of each other. Sometimes a popping sound will be heard as the crests eventually slide into the thread roots. Cross threading can occur when stabbing under load, the weight of the pipe can cause pin and coupling thread misalignment. This cocks the connector askew and further make up chews up the threads and turns the couplings. Cross threading may also occur when the connection is allowed to rock side to side during make up. The rocking can come from high rpm make up, bent pipe, pipe alignment or rig alignment.

Thread Compound. Another culprit for coupling turning is improper thread compound application. Too much thread compound can cause a hydraulic lock in the threads. Hydraulic lock is more common in cold climates where the grease is less viscous. Conversely, if thread compound is missing on the threaded surface then bare metal to metal contact generates enough friction to turn the coupling. A thin coating of the pin and coupling threaded surfaces is generally enough to solve this issue. Thread Compound contamination with dust or debris may also increase the friction enough to turn the coupling.

Thread Damage. Thread damage can also cause couplings to turn. Severe dents or gouges can turn into serious galling when the connections are made up. Sometimes the tools that form the threads on pipe or couplings break or chip during manufacture. This can cause the threads to seize up during makeup. Generally this is rare because of coupling inspection processes during manufacture and the fact that one side of the coupling is made up at the factory. A thread profile gage can usually be used to determine if this is the case.

Quick Reference Guide

***To be used with connection data sheet**

Make Up Torque

The Torque should be between the Min Make Up and Max Make Up Torque.

Makeup RPM.

First turn and a half 5 RPM or less.
Last turn and a half 10 RPM or less.
Max: 40 RPM up to 8.625" pipe
Max: 25 RPM 8.625" and larger

Shoulder Torque

Typically half the Optimum Make Up Torque or less. Must be below Min Make Up Torque. Must Have a shoulder. Shoulder torque must be higher than zero ft-lbs.

Running RPM

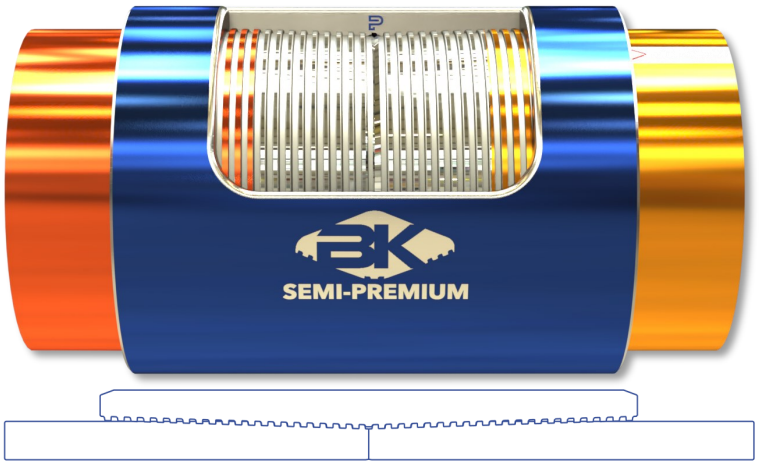
Recommended: 80-90 or lower
Max: 100 RPM in a dogleg.
Time at Max: 12 hours or less in high dogleg.
Operating torque depends on CRT limits.

Running Torque

Min: As low a possible to get the job done
Max: Max Operating Torque (85% Yield Torque)

Thread Compound

Jet Lube Run N Seal ECF & Kluberlub OCTG LF HT highly recommended (Good for temperatures exceeding 150°F). *BOL 2000* also works well. Use artic grades below 50°F.



Recommended Equipment

Buttress Compatible

All accessories with a buttress pin will reliably connect. The API pin and it's markings are not modified.

Stabbing Guide

Recommended for running and pulling to prevent thread damage

Tool Guide / Metal Box Thread protector

When running with Volant, TorkDrive, Tesco Casing Drive or similar casing running equipment that rotate casing by gripping internally, the use of a metal thread protector or tool guide to prevent thread damage or packer cup damage may be required.

Weight Compensator

Recommended to prevent thread damage by neutralizing tool and joint weight.

Sales

11200 Mesa Dr
Houston, Texas 77078
Phone: (832) 799-7414

Technical Support

Phone: (832) 405-3711
mike.nations@precision-llc.com

https://precision-llc.com/

Precision Connections, LLC

11200 Mesa Dr
Houston, Texas 77078
Phone: (713) 678-8900