

Mechanical Firing Head Running Procedures

Precautions:

1. In any situation where a loaded gun will be tripped into or out of the well, all personnel not necessary to the operation should be moved to a safe area, out of the line of fire unless the gun assembly is 70 meters or greater below surface.
2. If possible an insert no-go should be placed in the first pup joint above the firing head to prevent accidental detonation from objects larger than the drop bar. The pup joint length should be such that the drop bar fish neck is a suitable distance above the insert no-go when the drop bar is resting on the firing head pin. This will ensure that the drop bar can be fished if necessary.
3. If well conditions permit, the firing head should be ordered with a melting safety collar. This will help ensure the safety of the gun assembly at surface.
4. If a tubing release is being used, ensure that it is placed at least 10m above the firing head if possible. This can help prevent the drop bar from accidentally activating the release when the guns fire.



Running Procedure:

1. Make up and load the gun assembly in a designated explosives loading area. The assembled Firing Head is to be stored in a suitable area away from the loading area.
2. The gun assembly shall consist of a spacer gun of a suitable length (long enough to ensure that the perforating gun is below all sensitive wellhead equipment or areas occupied by personnel) installed in tandem above the perforating gun. A bi-direction booster must be installed at the end of the detonating cord in the spacer gun top sub. The cord should be cut to a length such that the end of the installed booster sits flush with, or no more than 1/4" below, the face of the top sub.
 Note: To prevent accidental detonation, it is important that the bi-directional booster does not protrude from the face of the top sub.
3. Install a bi-directional booster kit (part # TCP-BO-1000-***) in the guns.
4. Install a tandem sub on the perforating gun. Ensure that the 1" counter bore is facing up.
5. Install a bottom sub on the perforating gun.
6. Install a lifting sub on the top of the perforating gun and hoist the gun into the hole. Insert a landing plate into the groove on the tandem sub and disconnect the lifting hook from the sub. Do not remove the lifting sub.
7. Install a lifting sub on the top of the spacer gun. Install a handling sub on the bottom. Hoist the gun into position over the perforating gun.
8. Remove the handling sub from the bottom of the spacer gun and visually inspect the bottom of the gun to ensure there is no debris or moisture that could potentially interfere with the operation of the booster.
9. Remove the lifting sub from the perforating gun and install the spacer gun using 36" pipe wrenches with no snipes. Do not use tongs.
10. Lift the gun assembly enough to allow the landing plate to be removed. Remove the landing plate and lower the gun assembly into the hole. Insert the landing plate into the top sub and rest the gun assembly on the rig floor.
11. Retrieve the loaded firing head and remove the bottom thread protector.
12. Inspect the underside of the firing head to ensure there is no debris or moisture that could potentially interfere with the operation of the initiator.
13. Double check that the bi-directional booster is not too high (protruding above the top sub face) or too low (no more than 1/4" below the face of the top sub).
14. Install the firing head on the gun assembly. Use 36" pipe wrenches with no snipes. Do not use tongs.
15. Lift the next pup joint in the string into position over the firing head.

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16. Remove the handling sub from the top of the firing head and do a quick inspection of the firing pin area to ensure nothing is present that may interfere with its operation.
17. Install the pup joint on the firing head. Use 36" pipe wrenches with no snipes. Do not use tongs.
18. Remove the landing plate and continue to run tubing along with the other tools necessary for the job until the gun is at the correct depth.

Firing procedure:

1. If the melting safety collar is installed in the firing head, the gun assembly should be held at the firing position in the well for 30 minutes before the bar is dropped. This will allow the gun assembly temperature to equalize with the well environment.
2. When the gun is in position and ready to be fired, drop the appropriate drop bar through the tubing. A shot recorder can be used to detect the shock from the guns detonating. Also a shock can be felt through the tubing by hand when the drop bar hits the firing head.
3. If the gun is to be run back out of the hole, all reasonable efforts must be made to retrieve the drop bar first unless there is a positive indication that the gun assembly has fired.

Dismantling procedure:

1. If, for any reason, the gun assembly is to be run out of the well without a positive indication that the guns have fired, the gun must be treated as a loaded gun. The same precautions taken when the guns were assembled and run in the hole must be taken as the assembly is retrieved from the hole.
2. Trip the tubing out of the well until the elevators can latch onto the last pup joint attached to the firing head.
3. Raise the gun assembly until a hanger plate can be inserted into the hanger plate groove in the top sub of the gun assembly. Rest the gun assembly with the hanger plate on the rig floor.
4. Remove the firing head and pup joint from the gun assembly, apply an end protector to the top sub, and lay them down on the catwalk. The gun is now disarmed.
5. Disassemble the rest of the gun assembly by following the running procedure in reverse order.

Misfire Procedure

If all procedures have been followed and the gun assembly does not detonate, this procedure must be followed in order to minimize safety risks.

