**Head-end Ignition & Use of Wired Tracking Smoke Grain**

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***IMPORTANT***

***DO NOT*** install the bulkhead into the motor or connect the ignition wires to ***ANY*** electronics until you are at the launch pad or in an area designated by the RSO for installing igniters. For you own safety, your ignition electronics wiring ***must*** have a shunt installed on the igniter circuit path between your electronics and the connection/termination point to the head-end wires ***before*** connecting the ignition wires to your electronics. See the back page for a simple diagram. Your shunt device must be able to be easily re-installed in the case of a stand down of the flight. Prior to flight, you should verify the proper operation of your ignition electronics in an assembled, ready to fly condition, using a low voltage lamp bulb in place of an igniter. You may use an actual igniter identical to the one you use on wired smoke grain, but only in a designated safe area. Loki research recommends the use of QuickBurst Fat Boy Motor Starters. Allow a minimum of 3 seconds between the ignition signal to motor ignition.

**Assembly of the Igniter**

The wired tracking smoke grain with this reload is designed for head-end ignition. It is to be installed in the same manner as a regular tracking smoke grain with one exception. The thumb screw (54mm) or head bolt (76mm) is not to be used. The wire coming from the back side of the smoke grain will pass through the hole in the top of the bulkhead. Pull the wire when inserting the smoke grain into the bulkhead so that it does not kink or bend but remains in a straight line. Take care in the placement of the wire forward of the bulkhead. The wire will become hot enough to melt the insulation on the wire during the motor burn.

The short exposed leads at the forward end of the smoke grain are to be stripped back about ¼”. Cut your igniter wire about 1” from the back of the pyrogen. Strip ¼” of insulation off and carefully twist each pair of wires together. Separate each set of leads so that they do not touch and if necessary, fold a small piece of electrical tape around one or both pairs of exposed wire to prevent contact. If the leads are sufficiently separated, the tape is not needed. Bend the igniter so that upon installation of the forward bulkhead into the motor case, the igniter is against the side of the propellant core. Using an ohm meter, verify that you have the proper resistance across the far end of the leads, applicable to the igniter you are using. Do this before proceeding with anything else. Once you are done, short the leads from the top of the bulkhead by twisting them together.

Once you are at the pad and the bulkhead and motor are installed in the rocket, and the shunt is in place, only then may you connect the ignition wires from the bulkhead to the ignition wires from the electronics. ***ONLY*** after the rocket is on the launch rail and in the upright position should you make ***ANY*** attempt to arm ***ANY*** electronics.

**When the rocket is on the pad, the launch angle is set, and you are ready to arm all systems.**

1 – Send ***ALL*** non-essential personnel away from the pad and back to the required safety distance for the installed impulse. There should be no more than 2 people required at the pad at this point if a ladder is in use.

2 – Only after the pad is cleared of personnel, arm your 2nd stage deployment and telemetry/tracking electronics, but ***DO NOT*** remove the igniter shunt. Verify continuity on your recovery charges. Verify that your telemetry/tracking is a go.

3 – Arm your booster deployment and telemetry/tracking electronics. Verify continuity on your recovery charges. Verify that your telemetry/tracking is a go.

4 – Short the booster igniter leads together from the pad box to insure there is no power or stray voltage. Once this is confirmed, install the booster igniter and connect it to the pad box igniter leads. Verify continuity of the booster igniter.

5 – Only after all other essential items for flight are completed and verified, and after all double checks have been made, remove the shunt from the head-end ignition wire. If you hear a small pop, run away *immediately*. If not, carefully back away from the rocket and pad. Relocate to the required safety distance and call in the flight for launch. Continued on the back.

6 – If for any reason the flight is canceled, or it is found that further work needs to be done on the rocket or launch pad before flight, disconnect the booster igniter from the pad, then immediately reinstall the shunt device on the second stage igniter. Do this before preforming any work on the rocket or the launch pad.

7 – When all work is complete and you are ready again for launch, resume with step #4.



