

West Coast Hybrids



Basic Ground Support Equipment (GSE)

Read all instructions prior to use

Our new high amperage ground support equipment makes launching hybrids a breeze. While most other Non Pyrotechnic ignition methods use high voltage which has been related to deployment system failures our new unique high amperage system will not cause electronic related problems. We offer one of the most heavy-duty remote launching systems available on the market, we also believe this launch system to be one of the most efficient ways of launching hybrid rocket motors

System Description

The West Coast Hybrids Pyro-Free GSE system has been designed to be used from a clubs or individuals existing launch control power source and with the addition of a 12 volt automotive type battery(not supplied) at the pad. Automotive batteries supply the necessary amperage to power both the Fill Manifold and Fire sequence. Unlike other GSE brand that run voltage hundreds of feet and have issues pulling open the solenoid on hot days or with high bottle pressures. The West Coast Pyro-Free system places all of the necessary power at the pad. The system has been configured to only go together one way and uses heavy duty exterior shielded plugs and fittings on all components. The Basic Pyro-Free System allows you to fire most mono tube hybrids on the market.

Items required

12 volt automotive battery
3/4" masking tape
Nitrous Oxide supply tank (NOX)
Gaseous Oxygen supply tank
Large adjustable wrench
Stainless Steelwool or Sand paper

Stem Chart

G-I Impulse	1/4 OD
Max J Impulse	3/8 OD
K-M Impulse	1/2 OD

Setting up the system

Nitrous oxide supply tanks are fitted with three different types of valves, we supply with the most common the CGA326, this is the most popular valve for non medical grade nitrous oxide. The supply valves are easily identifiable as they are clearly marked with the corresponding number on the tank valve.

NOTE: Industrial grade or NON medical grade nitrous oxide contains an additive (sulfur dioxide) that produces a strong unpleasant smell and is meant to induce vomiting. This is done to make it impossible to use the NOX as a recreational drug, it also allows the hobbyist to buy nitrous without restrictions. Nitrous oxide and Gaseous oxygen are stored at very high pressures on average Nitrous is stored at 750 PSI and gaseous Oxygen at 2000-2200 PSI. West Coast Hybrids recommends leasing a cylinder from an industrial gas supplier such as a welding supply outfit, ask for a **non siphon type** bottle as this will allow you to lie the bottle down and prevent it from being tipped over, which is extremely dangerous. Install your 12-volt automotive battery in the supplied battery box red to positive, black to negative.

Getting started

Never use any form of lubricant on the threads of the Gaseous Oxygen or Nitrous oxide tanks or fittings (explosions can result)

Start by figuring out the launch site "lay out", you need to power the **controller** with 12 volts from the clubs or your existing power source away from the pad site preferably next to the LCO or launch control officers site. The 100' of control cable only will allow the system to be configured one way. Plug the corresponding ends together and run the 100' control cable in the direction of the appropriate launch pad site, plug the control cable into the remote battery module. **(make sure the controller key is removed until in use)** Place the remote battery box module next to the pad within six feet at the high amperage wires must reach the pad. Position the Nitrous Oxide and Gaseous Oxygen supply tanks next to the pad so the supplied extension hoses will reach the stem base. **Never place tanks under or within 2 feet of the pad, adequate supply hose is given to keep the supply tank well away from the pad.**

NOTE: always make sure the gland and nut fitting are free and clean from dirt. Leave bottles off until your rocket is on the pad and ready to be filled.

With the nitrous bottle lying down at the pad and opposite end from the valve propped up, connect the **Fill Manifold** to the Nitrous oxide supply tank fitting use the appropriate wrench as damage can occur to the Gland and Nut on the manifold. **(Make sure the nitrous bottle is supported well, as in the event that the motor must be dumped it can cause the bottle to move)** A large adjustable wrench works great for all set up applications. Be sure the Dump valve on the manifold is facing a safe direction away from the ground as this can blow dirt into fittings. Slowly open the nitrous supply tank valve and listen for any leaks. If you hear any hissing close the tank valve and wait for the hissing to stop then tighten the gland nut. **NOTE:** Liquid NOX can cause extreme frost bite, wear gloves and be sure not to touch any ice formed by leaking NOX. Now connect the appropriate electrical connection to the remote battery module box. Install the appropriate Push to Connect into the high pressure fitting corresponding to the motor intended for use.

Lie the oxygen bottle down and attach the gaseous oxygen regulator and solenoid assembly, tighten the nut with the large adjustable wrench. Slowly open the valve and listen for any hissing and re-tighten if necessary **(never use lubricants on any fittings)**. Set the oxygen pressure between 45-65 PSI. by turning the handle on the regulator. Now connect the appropriate electrical connection to the remote battery module. If the system has been used, check to insure the High Amperage ground lead at the Stem Base is well grounded by cleaning with stainless steel wool or sand paper, also insure the Positive lead is clean. Connect the Gaseous Oxygen push to connect to the Stem Base.

Prepare that **Stem Base** with the appropriate upper stem fitting to the corresponding fill stem size for the motor you intend on flying. Use the small plastic TECH fitting for G-I motors and the large TECH fitting for J-

M motors. The tech fitting is simply tightened around the fill hose to insure that no gaseous oxygen leaks from the stem, except through the tip of the coaxial stem.

Prepare the motor as per the operating instruction manual. Be sure the stem does not move or slide up and down once installed in the chamber. Do not support the rockets weight on the stem. The TECH fitting is used to adjust the stem height within the chamber. Do allow the stem to contact the top of the chamber or the piston. Although the adjustment is not critical it should be 1/4" to 3/4" of an inch away from the top of the chamber. (NOTE: West Coast Hybrids offer a adjustable fill stem stand which makes set up very simplistic.)

FILL & FIRING PROCEEDURE:

Lower your rocket onto the pad making sure not to allow the stem to support the weight of the rocket **(Make sure to use a stand off)** slide the nylon fill hose through the Stem Base and out through the bottom TECH fitting, tighten the TECH fitting hand tight. Hold the Stem and tighten the Stem nut to the upper Stem corresponding Stem fitting. **(Do not allow the stem to twist while tightening)**

Connect the Nylon fill hose to the push to connect on the nitrous supply hose. **(Make sure to tape or anchor the supply hose to the pad to keep it from flying off and damaging the push to connect of supply hose)** Check to insure the Supply tank vavles are open. Connect the 24 gauge wire to the positive (RED) lead at the Stem Base by wrapping the bared end around the clamp. Insure all electrical connections are attached.

Install the controller key into the controller and turn the power on. Start the fill process by activating the Combination Fill / Dump Switch to the Left. **(If any of the motor or GSE fittings are leaking from any location stop filling and re-tighten)** Once a clear visible stream of nitrous can be seen venting from the rocket motor a audible 5 4 3 2 1 count can begin. Simply release the Fill Switch and initiate the Fire button upwards. Make sure not to release the fire button until the rocket has left the stem. In the event of a miss-fire, cycle the combination Fill / Dump Switch to the Right and dump the contents of the motors tank to atmosphere. Re-cycle motor as per the assembly instruction and re-try.

Any questions or concerns don't hesitate to ask!

Available GSE ADD-ON's

500' foot control cable add on (J motors and above)
GSE Stem Base Stand
Braided Stainless Supply tank hoses



