



# SUCTION MODE FOR BALL LOADING

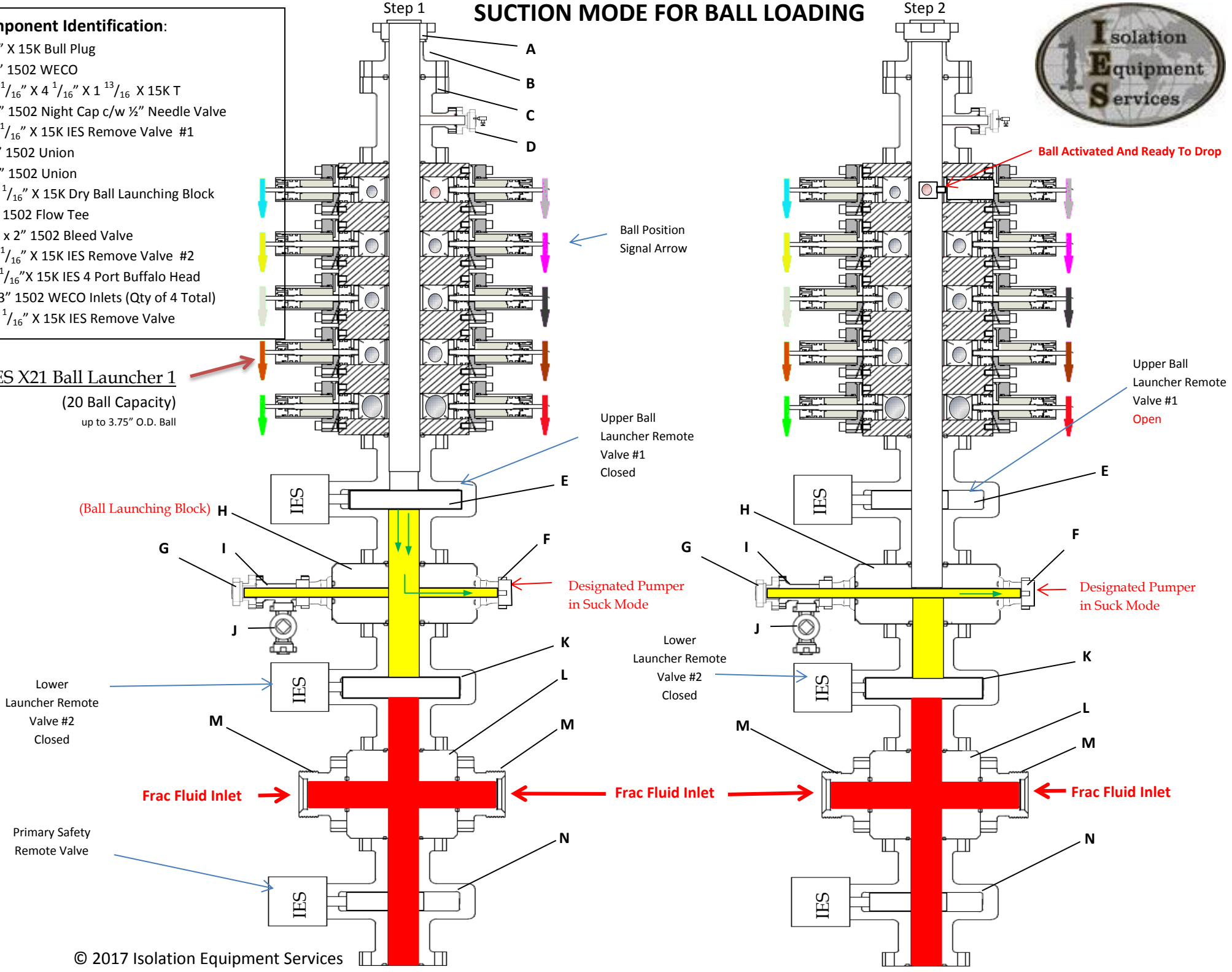
## Component Identification:

- A - 4" X 15K Bull Plug
- B - 4" 1502 WECO
- C - 4 1/16" X 4 1/16" X 1 13/16" X 15K T
- D - 2" 1502 Night Cap c/w 1/2" Needle Valve
- E - 4 1/16" X 15K IES Remove Valve #1
- F - 2" 1502 Union
- G - 2" 1502 Union
- H - 4 1/16" X 15K Dry Ball Launching Block
- I - 2" 1502 Flow Tee
- J - 1" x 2" 1502 Bleed Valve
- K - 4 1/16" X 15K IES Remove Valve #2
- L - 4 1/16" X 15K IES 4 Port Buffalo Head
- M - 3" 1502 WECO Inlets (Qty of 4 Total)
- N - 4 1/16" X 15K IES Remove Valve

**IES X21 Ball Launcher 1**  
(20 Ball Capacity)  
up to 3.75" O.D. Ball

Step 1

Step 2



Ball Position  
Signal Arrow

Upper Ball  
Launcher Remote  
Valve #1  
Closed

Designated Pumper  
in Suck Mode

Lower  
Launcher Remote  
Valve #2  
Closed

Ball Activated And Ready To Drop

Upper Ball  
Launcher Remote  
Valve #1  
Open

Designated Pumper  
in Suck Mode

Frac Fluid Inlet

Frac Fluid Inlet

Frac Fluid Inlet

Primary Safety  
Remote Valve

Lower  
Launcher Remote  
Valve #2  
Closed



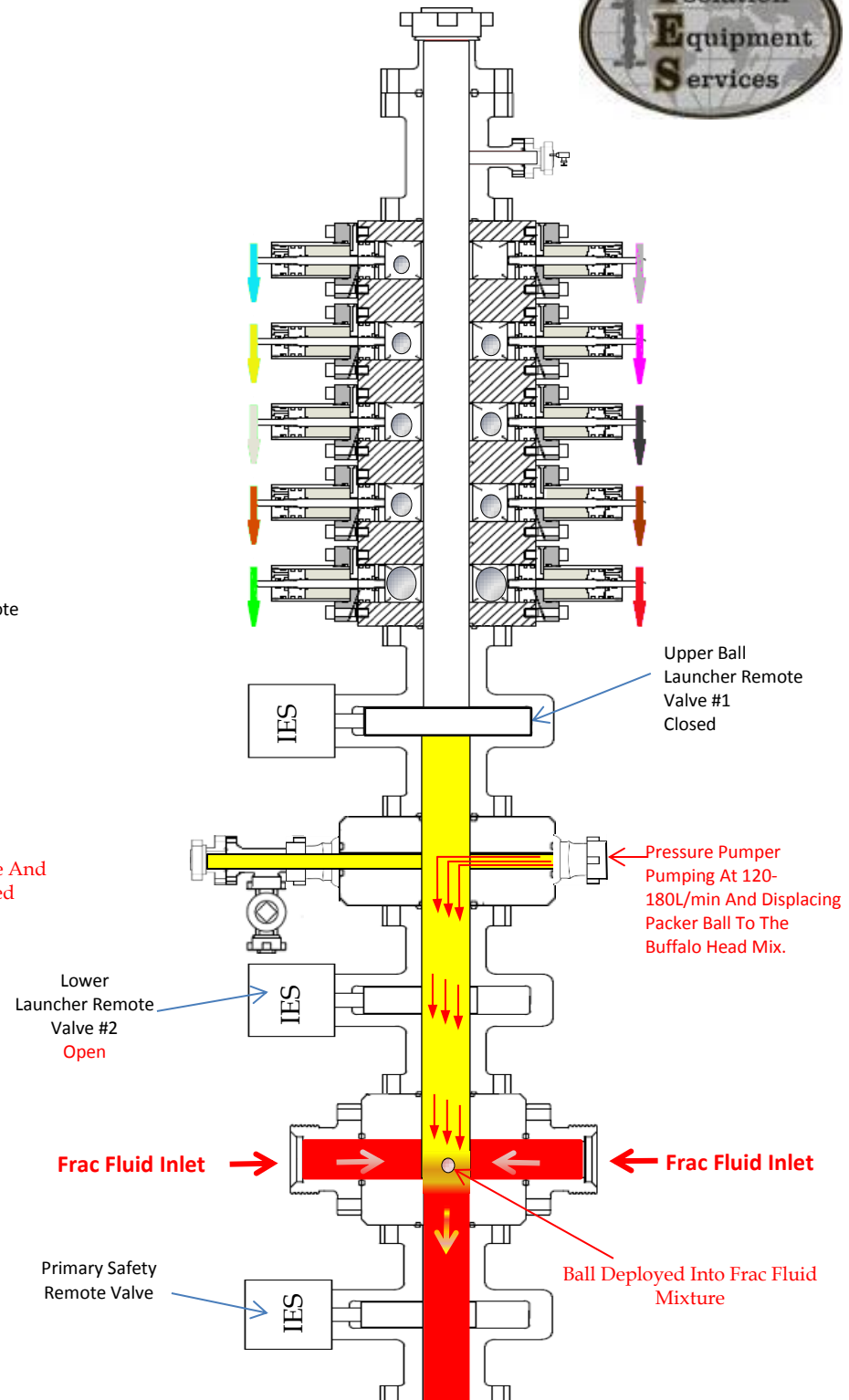
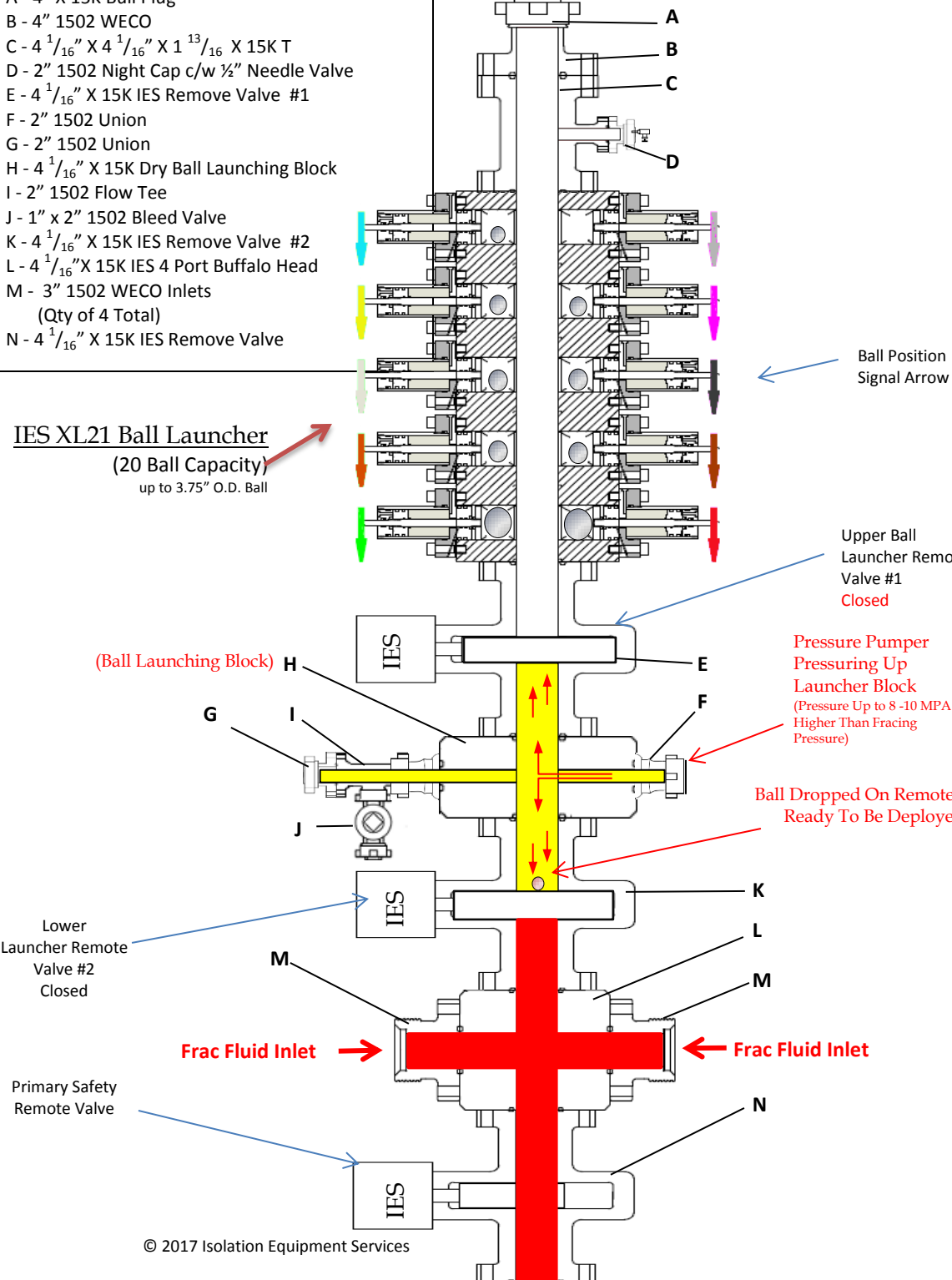
**Component Identification:**

- A - 4" X 15K Bull Plug
- B - 4" 1502 WECO
- C - 4 1/16" X 4 1/16" X 1 13/16" X 15K T
- D - 2" 1502 Night Cap c/w 1/2" Needle Valve
- E - 4 1/16" X 15K IES Remove Valve #1
- F - 2" 1502 Union
- G - 2" 1502 Union
- H - 4 1/16" X 15K Dry Ball Launching Block
- I - 2" 1502 Flow Tee
- J - 1" x 2" 1502 Bleed Valve
- K - 4 1/16" X 15K IES Remove Valve #2
- L - 4 1/16" X 15K IES 4 Port Buffalo Head
- M - 3" 1502 WECO Inlets  
(Qty of 4 Total)
- N - 4 1/16" X 15K IES Remove Valve

**Step 3 PRESSURE PUMPING FOR BALL DEPLOYMENT**

**Step 4**

**IES XL21 Ball Launcher**  
(20 Ball Capacity)  
up to 3.75" O.D. Ball



Ball Position  
Signal Arrow

Upper Ball  
Launcher Remote  
Valve #1  
Closed

Pressure Pumper  
Pressuring Up  
Launcher Block  
(Pressure Up to 8-10 MPA  
Higher Than Fracing  
Pressure)

Ball Dropped On Remote And  
Ready To Be Deployed

Upper Ball  
Launcher Remote  
Valve #1  
Closed

Pressure Pumper  
Pumping At 120-  
180L/min And Displacing  
Packer Ball To The  
Buffalo Head Mix.

Lower  
Launcher Remote  
Valve #2  
Open

Ball Deployed Into Frac Fluid  
Mixture

Lower  
Launcher Remote  
Valve #2  
Closed

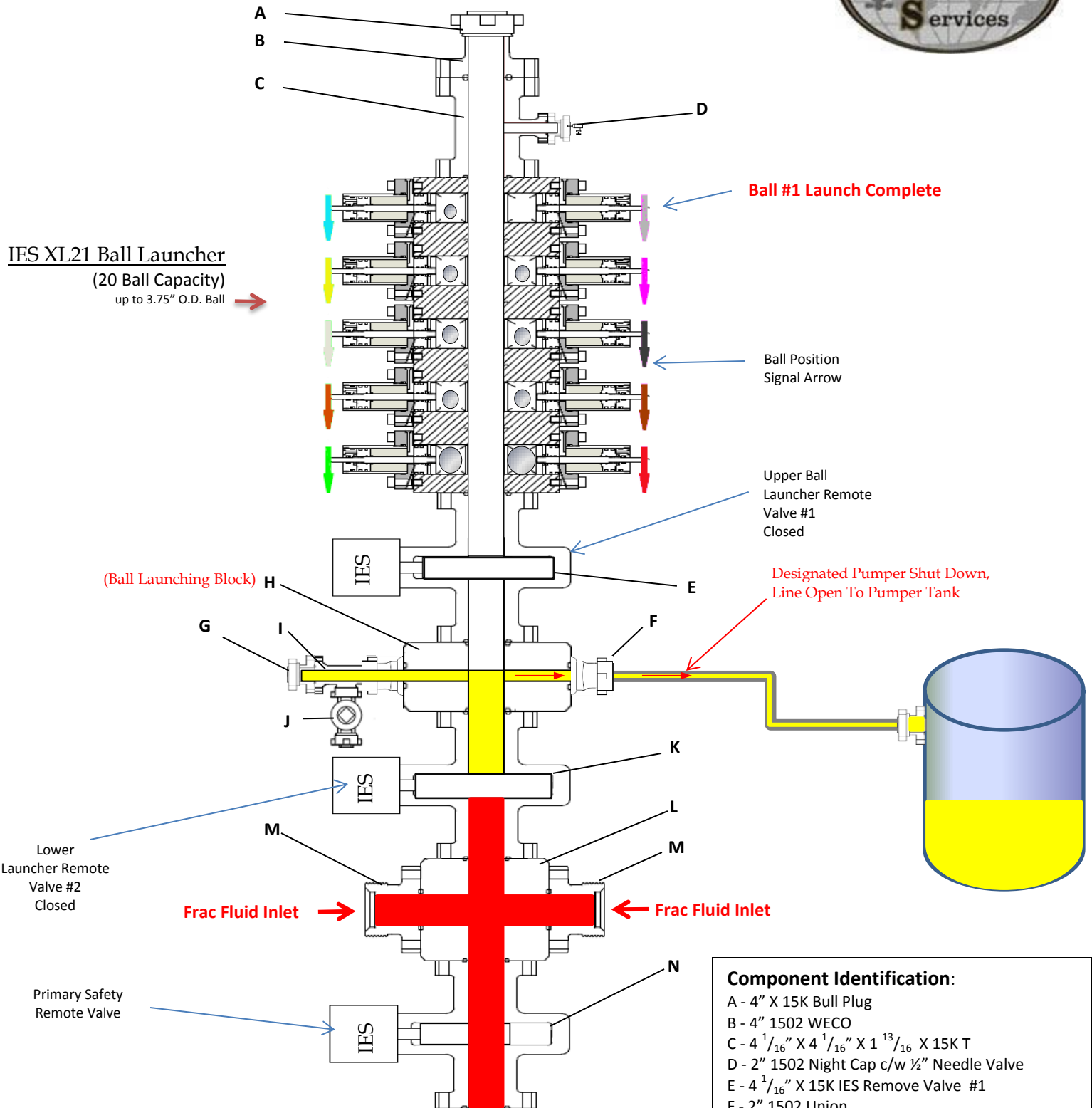
Primary Safety  
Remote Valve

Primary Safety  
Remote Valve



# BLEED DOWN AFTER BALL DEPLOYMENT

**IES XL21 Ball Launcher**  
(20 Ball Capacity)  
up to 3.75" O.D. Ball



- Component Identification:**
- A - 4" X 15K Bull Plug
  - B - 4" 1502 WECO
  - C - 4 1/16" X 4 1/16" X 1 13/16" X 15K T
  - D - 2" 1502 Night Cap c/w 1/2" Needle Valve
  - E - 4 1/16" X 15K IES Remove Valve #1
  - F - 2" 1502 Union
  - G - 2" 1502 Union
  - H - 4 1/16" X 15K Dry Ball Launching Block
  - I - 2" 1502 Flow Tee
  - J - 1" x 2" 1502 Bleed Valve
  - K - 4 1/16" X 15K IES Remove Valve #2
  - L - 4 1/16" X 15K IES 4 Port Buffalo Head
  - M - 3" 1502 WECO Inlets (Qty of 4 Total)
  - N - 4 1/16" X 15K IES Remove Valve