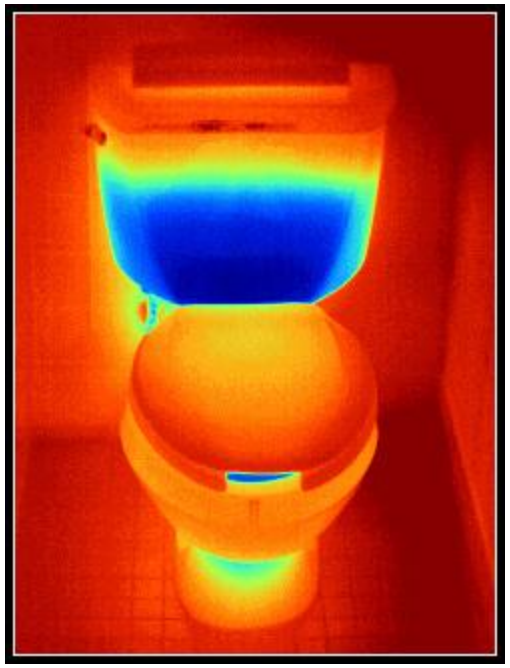
Cross –Connection Control

A cross-connection is the link or channel connecting a source of pollution with a potable water supply.



Cross-Connections

We must eliminate the cross-connection when possible

Not Possible? then properly separate it from the Drinking Water System

Utilizing the appropriate type of back–flow devise, or plumbing arrangement.

Eliminate the Cross Connection

* Eliminate the cross-connection
* Properly plumb the system to provide and air gap
* Install appropriate type of back flow devise

Things to keep in mind:

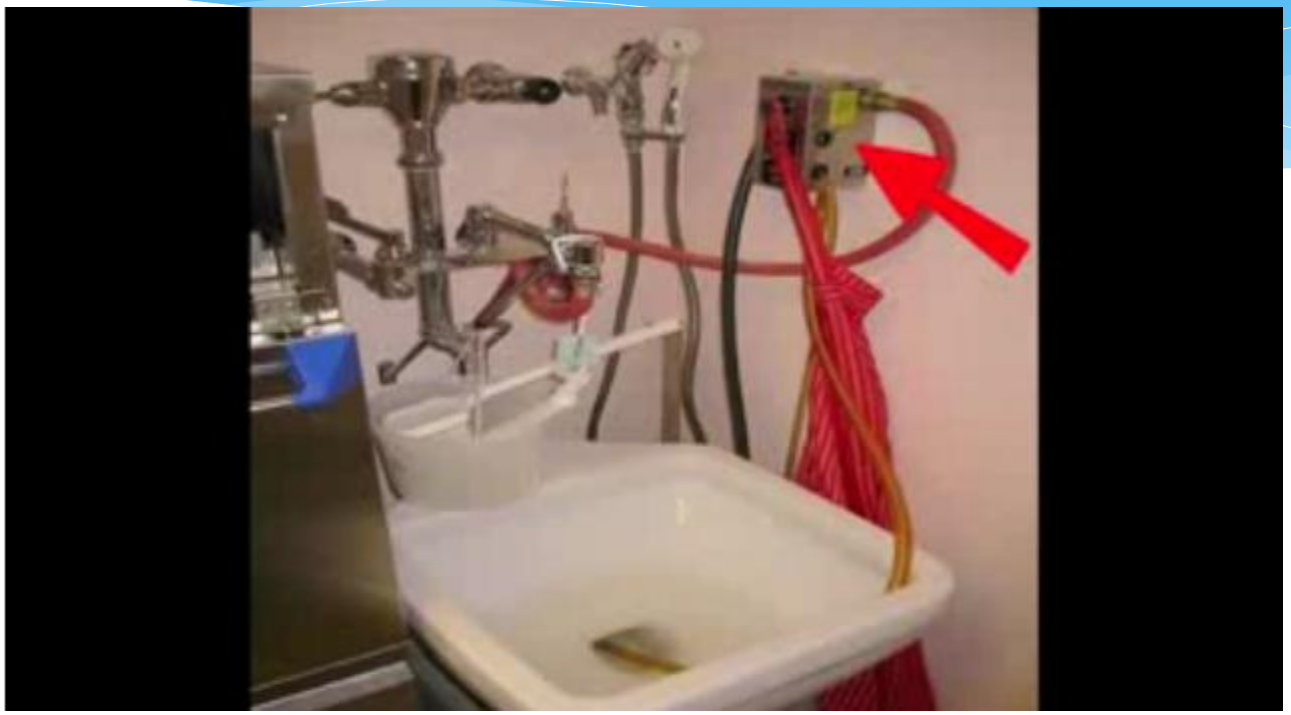
* How many of you are Master Plumbers
* I really did not expect to see any here today.
* Thus you are not expected to do the work of a master plumber
* However, the more eyes we have out there looking in the right places, will better protect public health.

Why do Cross-connections exist?

1. Installed by persons unaware
   dangers of cross-connections.
2. Convenience without regard to dangers
   or the situation created
3. Reliance on inadequate protection
   Single valve mechanical device or wrong type
   Single Check valve, double Check, RPZ,

How can we help

* Look for cross-connections
* Ask the right questions
* Listen to their response (save, store, revisit)
* Be conscious of processes
* Don’t Assume
* Don’t miss anything ☺




AUTO SPKR
Watch Later
4:56 / 6:49

Major Cause

* Pressure differential situations
* Water or contaminants will flow from zones of greater pressure to zones of lesser pressure

Causes

* Power loss (storms, accidents, disasters)
* water main breaks (freezing, rusted piping etc.)
* temperature (Boilers, Heating systems, Hoses in Sun)
* elevation (Water back pressure increases as you elevate the water line) Baptismal Baths, cottages at higher elevations than the source.

Back flow

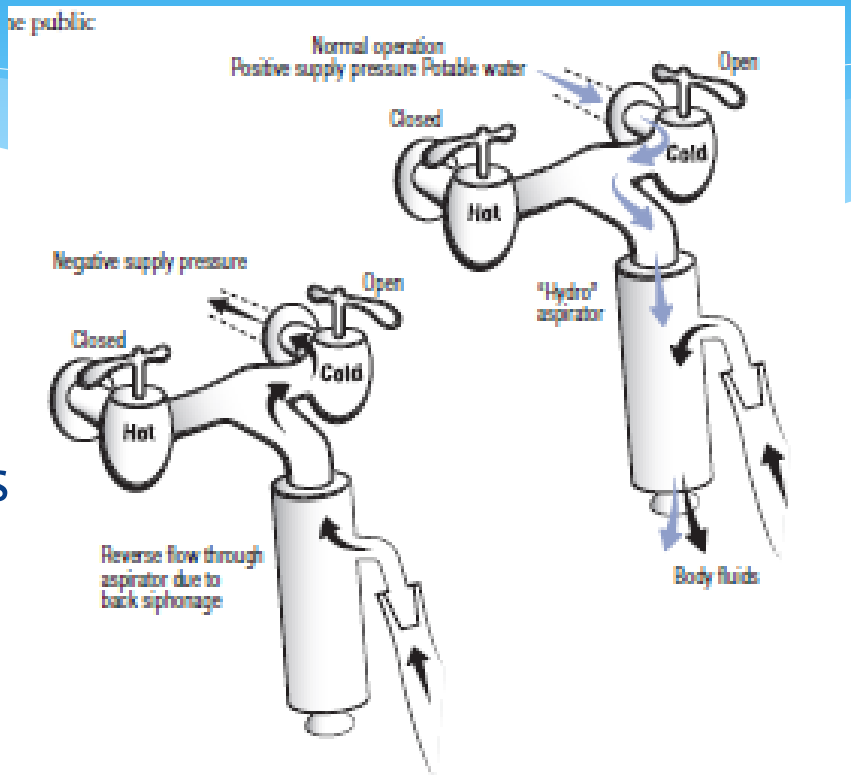
* Does happen
* The right situations do occur for it to happen
* When the situation is right it happens now
* There is no waiting for it to occur it is instantaneous in most cases.

Power Loss Situations

* Pump shuts off,
* check valve in the pump is old and fails
* Second check valve in the well above the submersible pump also fails or is non-existent
* Check valve is installed after a buried portion of distribution line in the building, before the pressure tank
* Water flows back down into the well creating a negative pressure in the distribution system siphoning what ever it can back into the water lines.

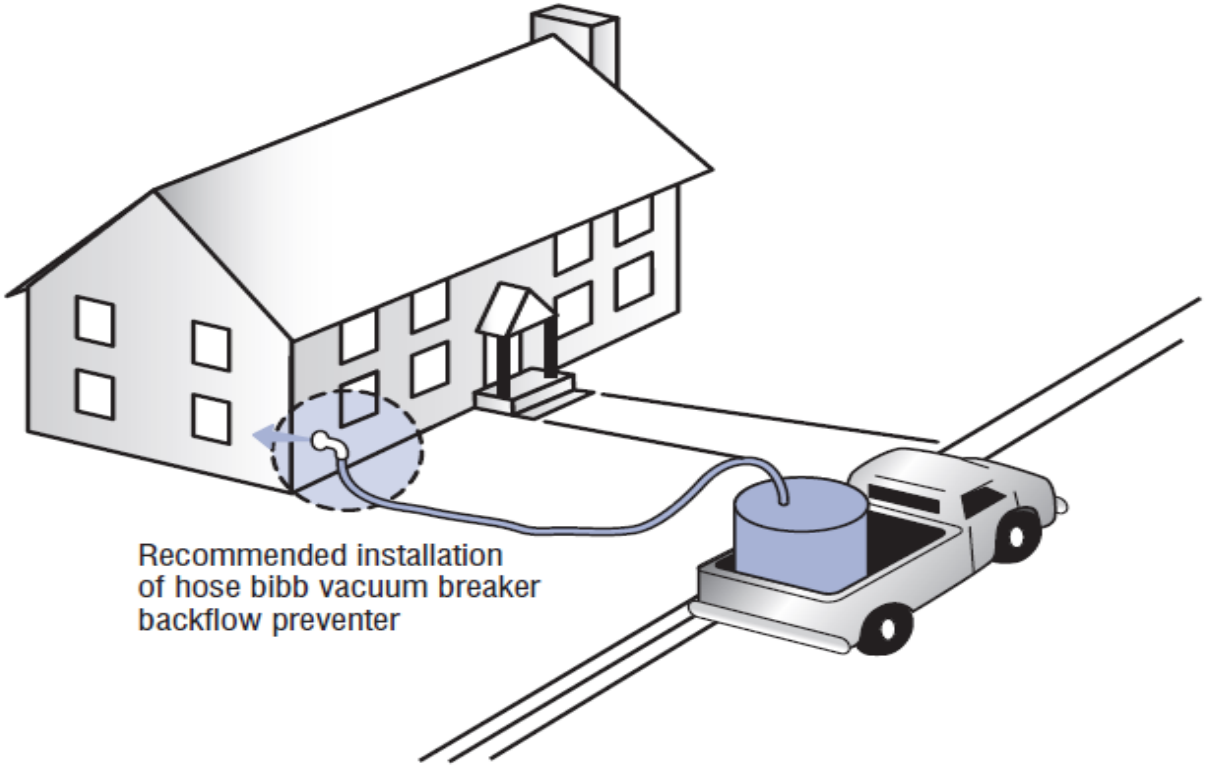
Back Flow Happens

* Aspirators
* Funeral Homes
* Veterinarians/Doctors Offices
* Chemical injection systems
* Mixing stations



Back-Siphoning

* Hose bib vacuum
* Breaker back-flow
* Preventer

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HOSE CONNECTED TO POTABLE FOR WASHING
VEHICLES - NO BACKFLOW PROTECTION.


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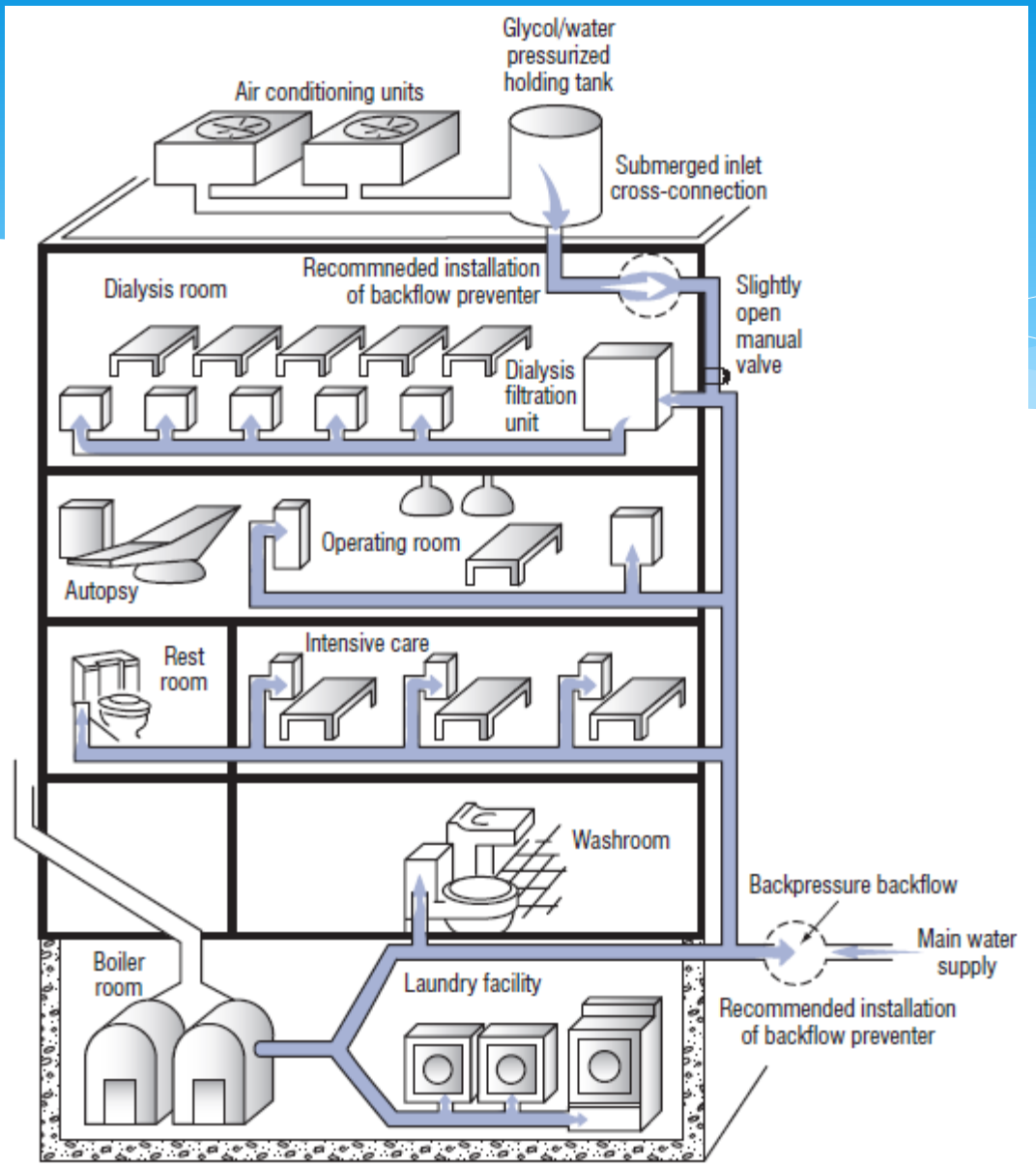

Glycol/water pressurized holding tank
Air conditioning units
Submerged inlet cross-connection
Recommneded installation of backflow preventer
Dialysis room
Slightly open manual valve
Dialysis filtration unit
Operating room
Autopsy
Rest room
Intensive care
Washroom
Backpressure backflow
Main water supply
Boiler room
Laundry facility
Recommended installation of backflow preventer

Back Pressure

* Need and RPB Valve
* Reduced Pressure Principal Back Flow Preventer

Cross-Connection

* Elimination
* Unused well serving as a back-up
* Not Needed, Isolate, Eliminate
* Once forced with a decision things happen


03.27.2012

Cross-Connection Control and Back Flow Protection (preventer).

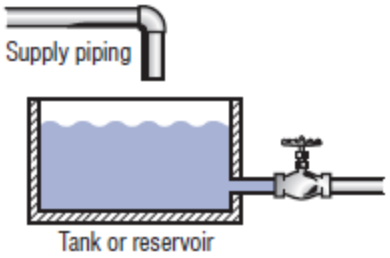

TE-CHENG
ASSE 1011

All Types have there place.

* There is no one type fits all scenarios.
* Excellent Document that exists out there and I would encourage you all to read it.

* Put out by **EPA**, is a downloadable PDF file.
* **Cross-Connection Control Manual**
* www.epa.gov/safewater **EPA 816-R-03-002**

FIGURE 13.
Air gap in a piping system.



Barometric Loop

The barometric loop consists of a continuous section of supply piping that abruptly rises to a height of approximately 35 feet and then returns back down to the originating level. It is a loop in the piping system that effectively protects against backsiphonage. It may not be used to protect against back-pressure.

Its operation, in the protection against back-siphonage, is based upon the principle that a water column, at sea level pressure, will not rise above 33.9 feet (Ref. Chapter 3, Fig. 4 Page 13).

In general, barometric loops are locally fabricated, and are 35 feet high.

FIGURE 14

Atmospheric Vacuum Breaker

These devices are among the simplest and least expensive mechanical types of backflow preventers and, when installed properly, can provide excellent protection against back-siphonage. They must not be utilized to protect against backpressure conditions. Construction consists usually of a polyethylene float which is free to travel on a shaft and seal in the uppermost position against atmosphere with an elastomeric disc. Water flow lifts the float, which then causes the disc to seal. Water pressure keeps the float in the upward sealed position. Termination of the water supply will cause the disc to drop down venting the unit to atmosphere and thereby opening downstream piping to atmospheric pressure, thus preventing backsiphonage. Figure 15 shows a typical atmospheric breaker.

In general, these devices are available in ½-inch through 3-inch size and must be installed vertically, must not have shutoffs downstream, and must be installed at least

FIGURE 15.
Atmospheric vacuum breaker.

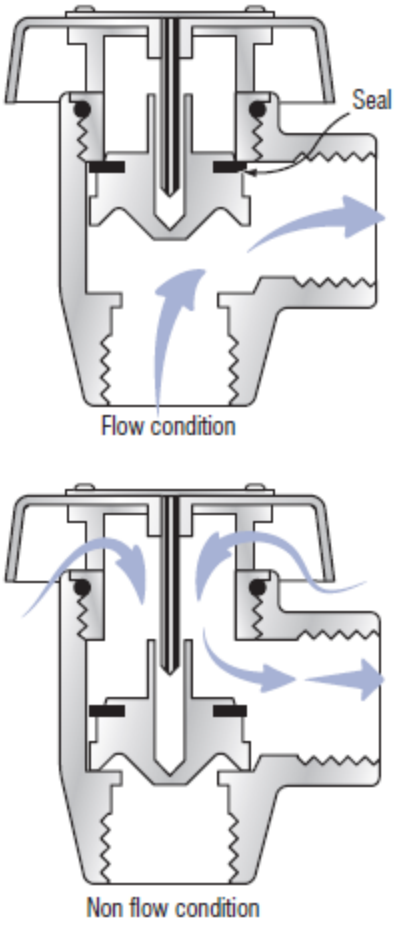


Figure 16 shows the generally accepted installation requirements—note that no shutoff valve is downstream of the device that would otherwise keep the atmospheric

FIGURE 16.
Atmospheric vacuum breaker typical installation.

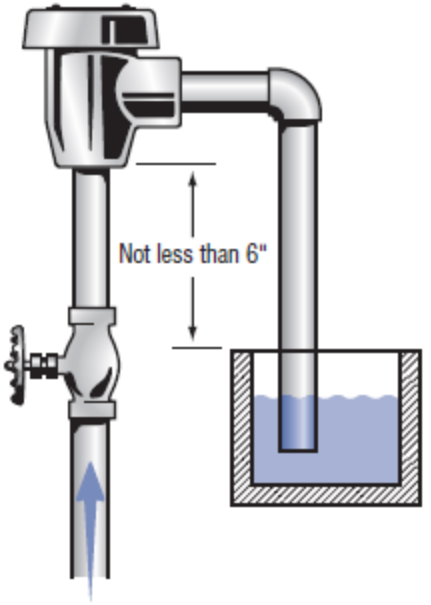


FIGURE 17.
Atmospheric vacuum breaker in plumbing supply system.

Excellent Installation for a treatment System Drain to eliminate the submerged Inlet!

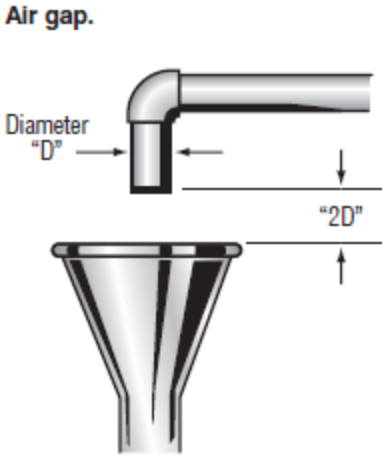
Treatment System Drains to a manufactured fitting to solve the submerged inlet situation.

The proper fittings are out there at the distributers warehouse. The owner gets them by hiring a licensed Plumber and telling them that what they want solved.

Air Gap

* Piping Dia. >1” = Min 2”

* Piping Dia. <1”= 2 pipe diameters



Description	Standard	Photo	Limitations
Hose Connection Vacuum Breakers	ASSE 1011		1. Not allowed for continuous pressure except for campgrounds and marinas. 2. Maximum of 10 feet of water column backpressure. 3. No valve downstream. 4. Not allowed on wall hydrants installed after March 1, 1994. 5. Standard to be clearly visible on the device.
	ASSE 1052		1. Not allowed for continuous pressure except for campgrounds and marinas. 2. Maximum of 10 feet of water column backpressure. 3. No valve downstream. 4. Not allowed on wall hydrants installed after March 1, 1994. 5. Standard to be clearly visible on the device.
Wall Hydrant, Frost Proof Automatic Draining Anti-Backflow Type	ASSE 1019 A or B		1. Not allowed for continuous pressure except for campgrounds and marinas. 2. Maximum of 10 feet of water column backpressure. 3. No valve downstream. 4. Required for wall hydrants installed after March 1, 1994. 5. Standard to be clearly visible on the device.
	ASSE 1011		
Pipe Applied Atmospheric Type Vacuum Breaker	ASSE 1011 Vacuum Breaker		1. Not allowed for continuous pressure 2. No backpressure allowed. 3. No valve downstream. 4. Critical level a minimum of 6" above where backpressure could be created. 5. Standard to be clearly visible on the device. 6. If used on a service sink faucet, the device needs to be 7'6" off the floor.

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http://www.youtube.com/watch?v=kFODZ2-ME2o

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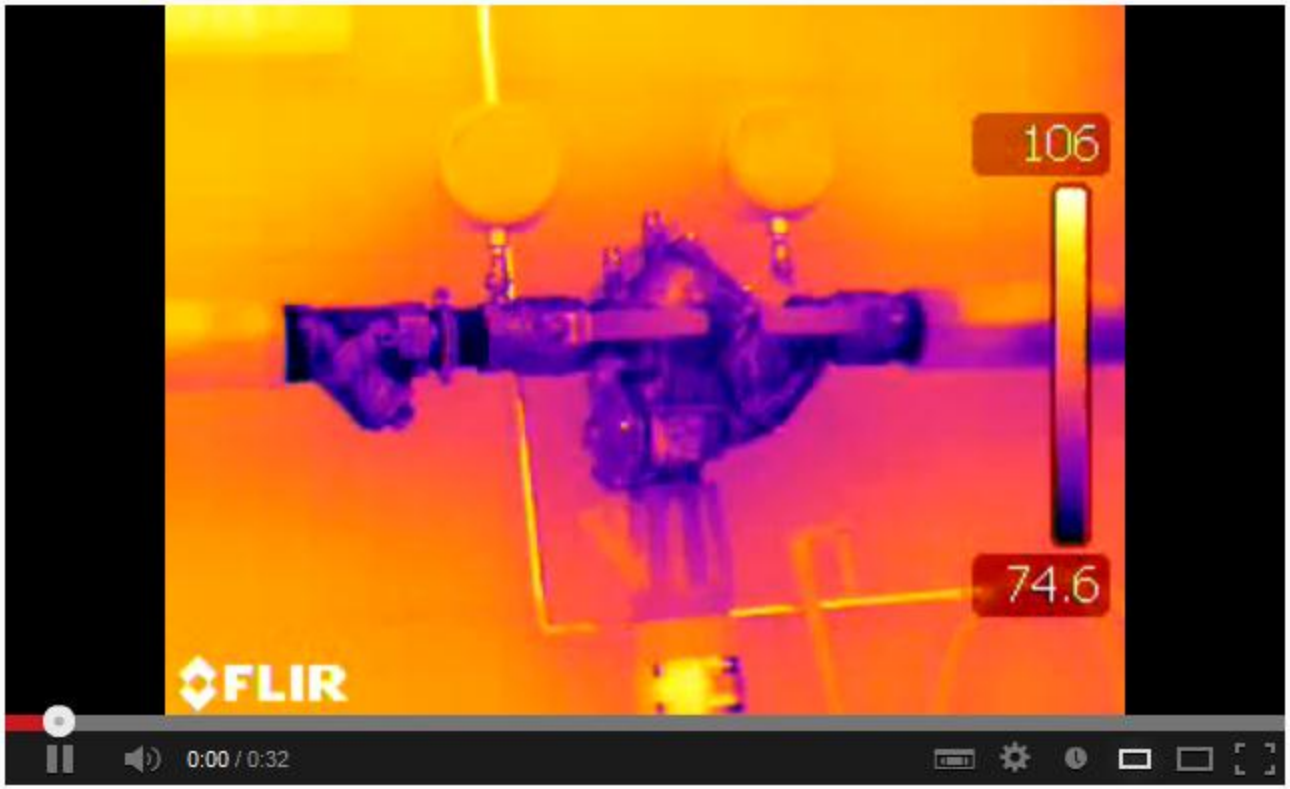
YouTube

Upload



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by Paul Cochrane
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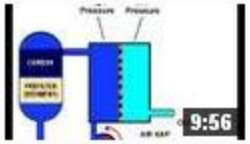

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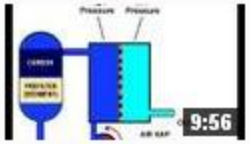

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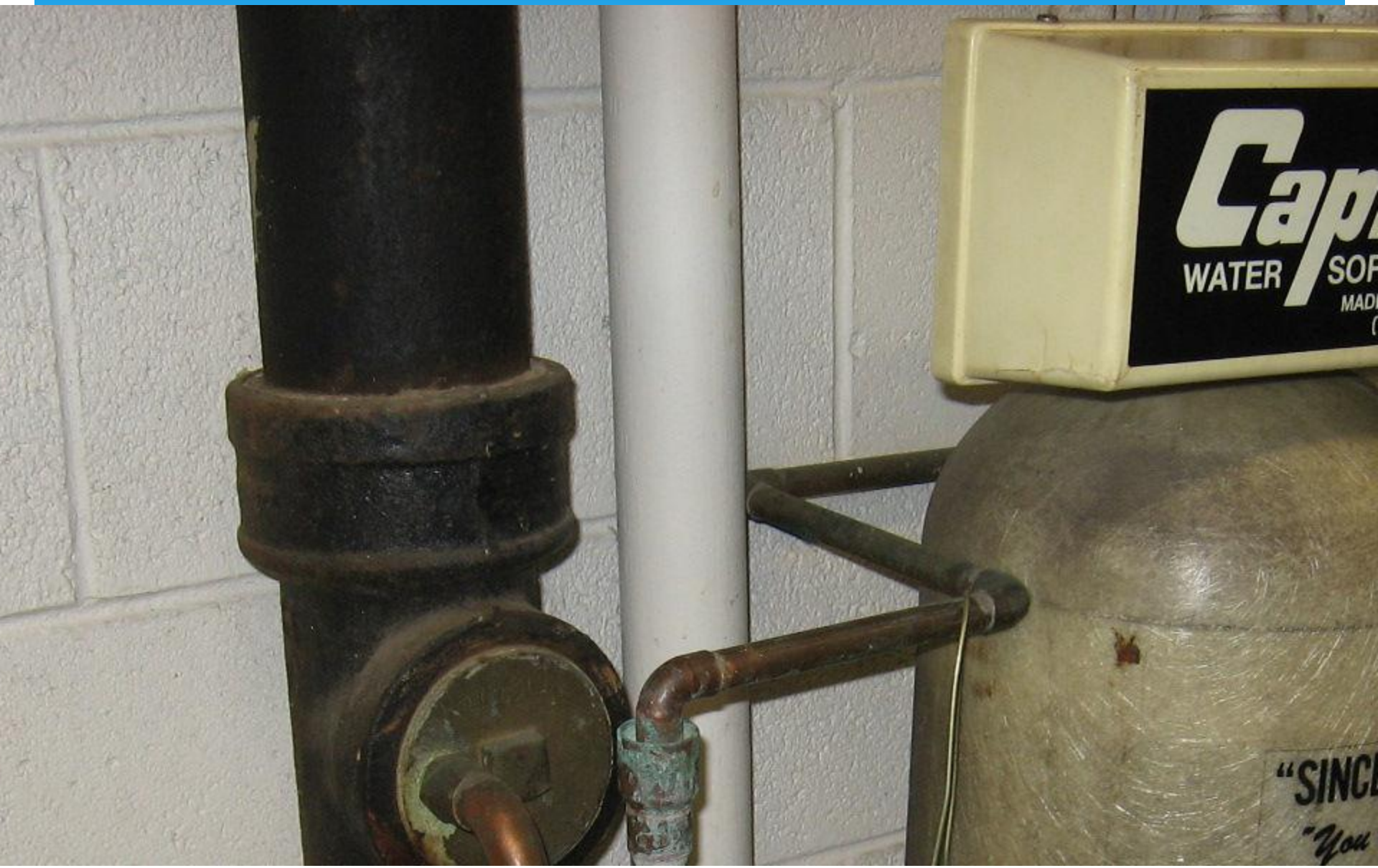
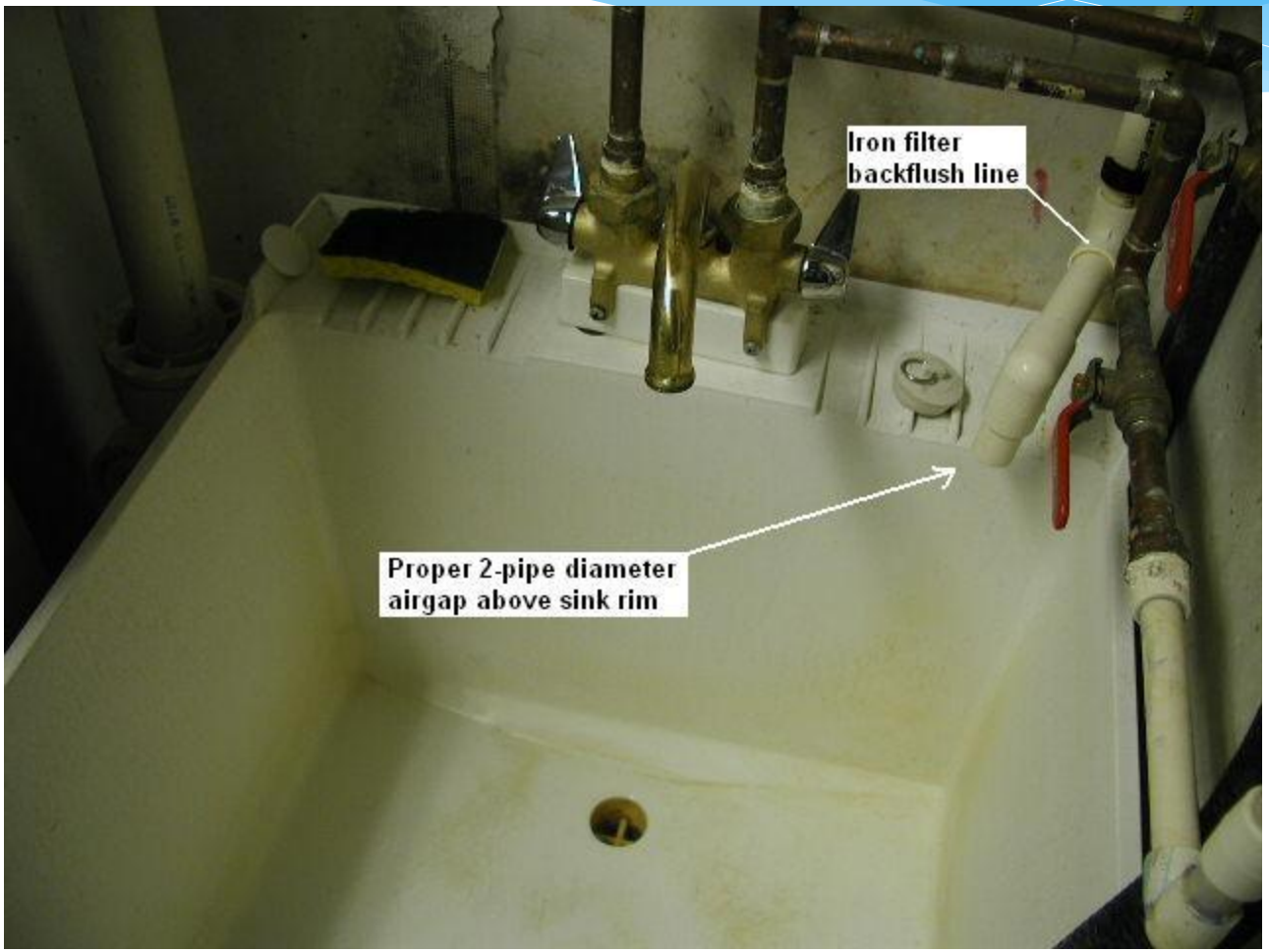
267600
FORMALDEHYDE 37% 11M
Technical
LR048805506
485 LBS.
CORROSIVE
8
Duplex Mfg Co. Pitless Unit
and Vermin Proof Well Seal

Apts #2 - 9/25/07 - Czarkowski - Basement of Street


07/29


WATER


Softener Backflush
Potential Cross Connection, Hard-Plumbed
Connection from Water Softener Backflush
To Sanitary Sewer Drain
Sewer Drain
Country Aire Apartments 2 - 9/25/07 - Czarkowski
Basement of 4900 Easy Street - Well #2


Iron filter
backflush line
Proper 2-pipe diameter
airgap above sink rim

Nice Installation

* This is what all our installations look like, Right?

Unfortunately, Not!


FLUSHING HOSE CONNECTED TO POTABLE WATER
SUPPLY AND LYING ON GROUND.

PRESSURE HEAD = $h_p = \frac{\text{PRESSURE}}{\text{DENSITY}}$

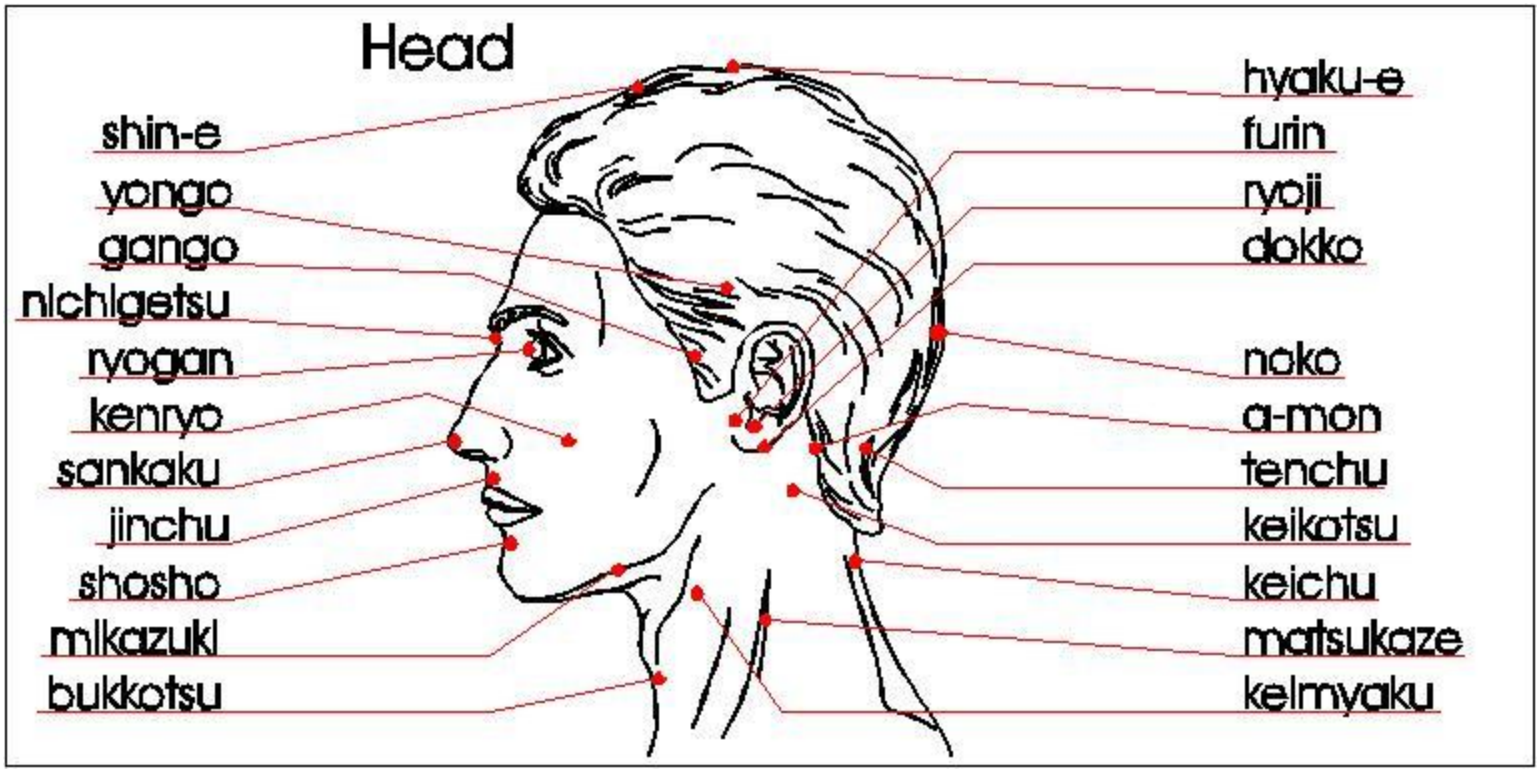
VELOCITY HEAD = $h_v = \frac{\text{VELOCITY}^2}{2 \times \text{GRAVITY}}$

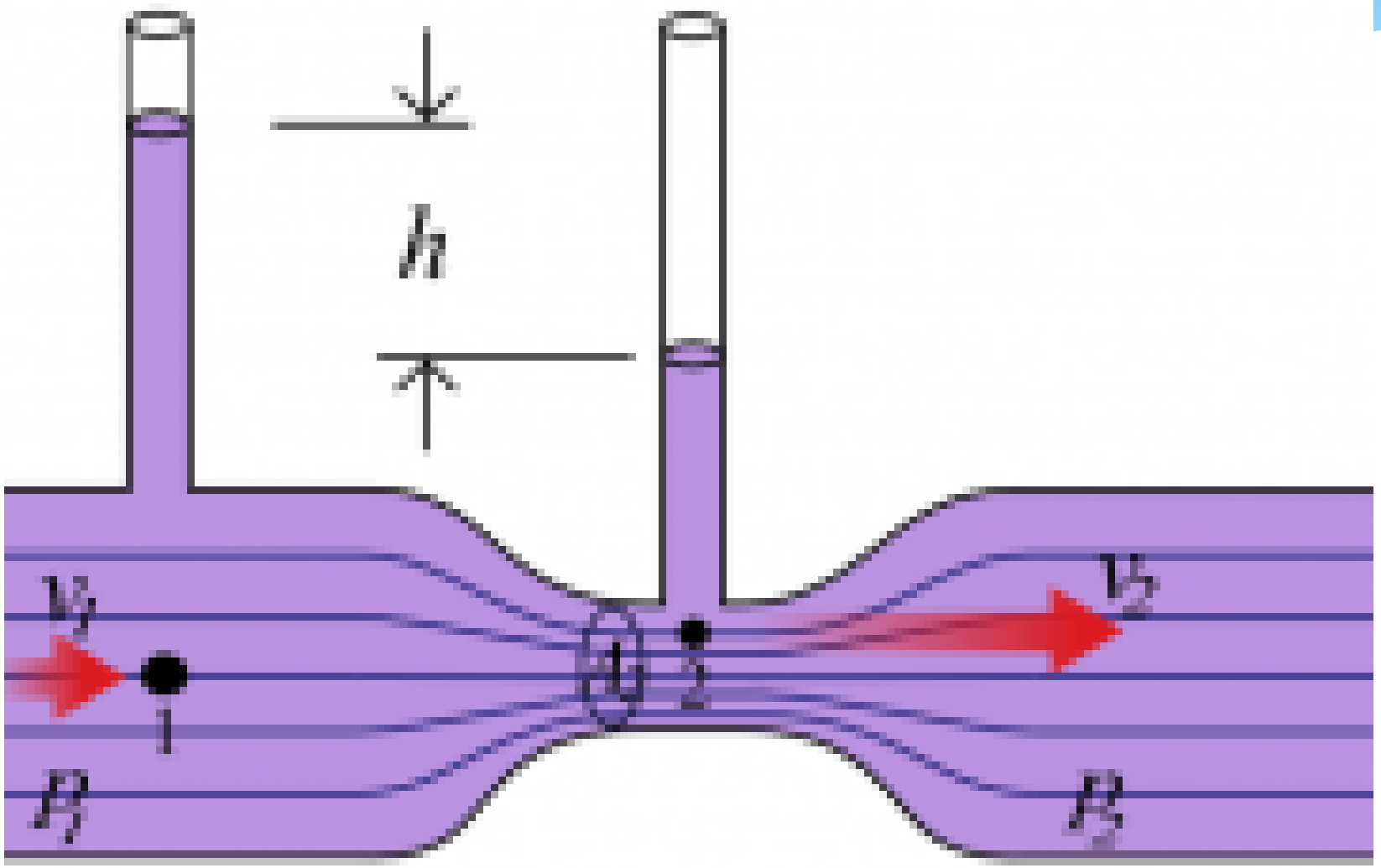
POTENTIAL HEAD = z = ELEVATION ABOVE DATUM

SO TOTAL HEAD = $h_p + h_v + z$

(WHICH IS THE TOTAL AMOUNT OF ENERGY IN THE FLUID)

PRESSURE + HEAD


Head
shin-e
yongo
gango
nichigetsu
ryogan
kenryo
sankaku
jinchu
shosho
mikazuki
bukkotsu
hyaku-e
furin
ryoji
dokko
noko
a-mon
tenchu
keikotsu
keichu
matsukaze
keimyaku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