

PREHEAT OIL DAY TANK

"The installation of a preheat oil day (illustration left) would have significant value in reducing fuel oil costs"



**DAY TANK
FAIRBANKS, ALASKA 1994**



**DAY TANK (RED)
1991 KING SALMON, AK**

Outdoor fuel oil storage tanks that are exposed to temperatures lower than 32F degrees certain problems can occur. For example, outdoor tanks can easily become quite cold so that the oil in it thickens enough to change the atomizing pattern of the oil burner nozzle located on the boiler.

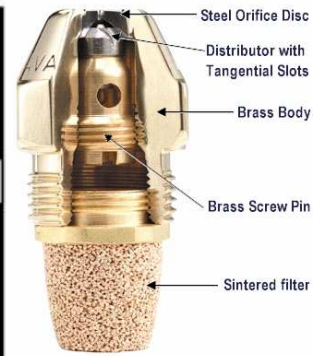
A change such as this (oil thickens), will result partly in oil droplets becoming bigger thus making the oil burner flame longer and more "sluggish" in burning. It also increases nozzle output resulting in smokier burner operation, the result of which is soot caked in the combustion chamber and flue and more heating fuel oil is consumed.



COLD OIL NOZZLE SPRAY



WARM OIL SPRAY



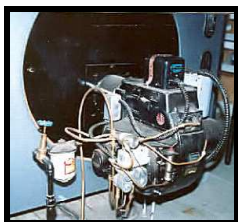
BURNER NOZZLE

Above photographs courtesy of Delavan Spray Technologies (A BF GoodRich Company): A Total Look at Oil Burner Nozzles a Reference Guide for Burner Service Technicians **"Effects of Viscosity On Nozzle Performance"**



OIL BURNERS

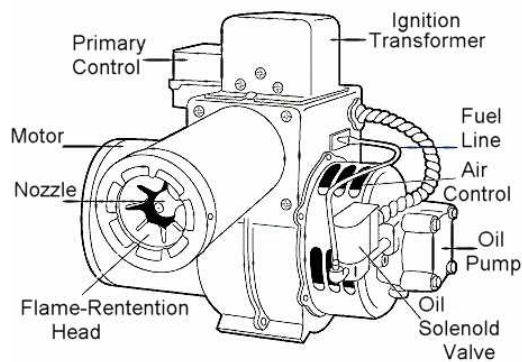
For demonstration a Beckett & Gordon Piatt are shown at left



**GORDON PIATT BURNER REPLACEMENT , CHEVAK AK 1992
BEFORE & AFTER BY NUSHAGAK CONSULTANTS**



"Replacing an old antiquated burner with a new flame retention burner can save up to 15 percent on oil consumption and the electric cost of running the burner".



1980's - 1990's VINTAGE OIL BURNER



DEMONSTRATION: BECKETT'S NEW HIGH-TECH OIL BURNER



PILOT STATION NATIVE STORE - 1992

Since the turn of the century, technology continues to advance making life much easier and less costly. Computers and cell phones have had major breakthroughs moving from efficient to high-tech.

Oil burners have moved in the same direction offering customers the latest and the best in high-tech efficiency versus burners that were born in the 80's and 90's. Static pressure has been getting higher and higher. The electronic controls are getting smarter and more reliable. Burner manufactures are going back to interrupted ignition and using igniters instead of ignition transformers. The pumps feature more positive cut-off. They have switched from sleeved bearing motors to ball-bearing PSC motors. The new nozzles are better in many little ways. The new smart controls feature pre- and post-purge for cleaner startup and shutdown. These burners can run so clean that there is almost no soot and scale build-up over the heating season. This means that the efficiency does not go down through the season as it does with older burners. Properly adjusted new burners do not need to be tuned up every year.

The result is that while the new burners look pretty much the same as the old burners, they are far superior. They are more efficient, more reliable, safer and even quieter than the 1980's and 1990's flame-retention burners. They use a *great deal less electricity* than the older models.

In October 2006, Nushagak Consultants replaced the early 1990's vintage oil burners and installed Beckett's new high-tech oil burners on the boilers for the Pilot Station Native Store, Pilot Station Alaska; a 7,000 sq ft building heating system that Nushagak originally designed and installed in 1992.

On startup it was absolutely astounding the performance of the new burners. Instantly the new burners went from old burner hard to adjust erratic flame to a smooth flame stability caused by the higher static pressure of the new improved burners. The burners ran clean with the air intakes set open not nearly as far as the old burner settings, which shall definitely reduce off-cycle airflow through the boilers reducing heat loss in the building during cold weather.

THE NEW ADVANCED TECHNOLOGY

Residential and Light Commercial Applications



BECKETT ELECTRONIC OIL IGNITION



BECKETT CLEANCUT PUMP



BECKETT PSC MOTOR



BECKETT R7184 SERIES CONTROLS

- Higher constant output voltage
 - More reliable ignition, especially with cold oil
 - Long life electrodes require less adjustment
 - Smaller lighter and more compact than ever
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- Smoother, cleaner shutdown and light-off
 - Less moving parts compared to conventional pumps
 - Reduced load on motor
 - Higher capacity – up to 4 gph @ 100 psi
 - Build-in Solenoid valve cuts oil flow instantly
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- Lower amp draw
 - Cooler operation
 - Fewer Failures
 - Delivers more power
 - Ball Bearings for longer life
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- Interrupted-Duty Ignition--**extends the life of the ignition system** (igniter/transformer and electrodes) and **reduces component noise**.
 - Limited Recycle/Limited Reset--**minimizes** the number (2) of times the **operator** can hit the **reset** button.
 - Communications Port--enables the control to communicate with service instruments, security systems or data acquisition equipment.
 - **Diagnostic LED**--a service tool that indicates cad cell resistance and operational status (lockout, recycle, etc.).
 - Ambient Range from **-40 to +150 F**
 - 15 second **pre-purge**, selectable **post-purge** and **alarm contacts**.