Earlier this year the 82’ crabber-longliner F/V Jeanoah repowered up in Kodiak with a 6WG1. Originally powered by a 6100-lb, 1473-cu/in Cat D353 rated 425 hp @ 1200 rpm, the 1970 Bender-built boat cruised 8 kts @ 1050 rpm. Pushed hard the big Cat was thirsty, burning fuel up to 23 gal/hr.

Fast-forward 4 decades, to owner Fairweather Fisheries, Jerry Bongen & James Stevens, fishing an area from Sitka out to the Aleutians—basically, the North Pacific Ocean. Jeanoah needed a hard-working, dependable, fuel-efficient engine—& quiet was a bonus. She found it all in the UM6WG1WM-AB1 Isuzu M-1, rated 505 hp @ 1,800 rpm.

The new engine was connected to a dual-circuit keel-cooler system separating the after-cooler water from the engine-jacket water. With a Cowl critical-grade exhaust silencer, Twin Disc MG5170 reduction gear with 6:1 ratio replacing a Twin Disc MG521 at 4.5:1, & an HPCR maximum fuel pressure of 27,000 psi over the Cat’s 750—the new Isuzu far surpasses the fuel economy, smoothness, & exhaust emissions of the old Cat.

Charlie Madsen of Kodiak Diesel Service Inc. did the install and speaks highly of Isuzu’s support service. He says when calling the Cincinnati, Ohio, warehouse with technical questions he found the staff prompt & helpful, with his spare-parts order in-stock & then in Kodiak the next day.

On its inaugural run from Kodiak to Sitka, Jeanoah ran with another Bender boat—her sister ship F/V Ruff & Ready—equipped with a Cummins 500-hp KTA-19. While the R&R ran 8 kts @ 1800 rpm burning 17 gph, the Jeanoah—cruising 9 kts @ 1600 rpm—burned only 11. The crew found the new Isuzu so quiet they said they could carry on a conversation in the engine room—underway at 1800 rpm.

Dennis Rankin of Oregon also repowered his dragger, the F/V Ashlyne, as reported in the July 2008 Fishermen’s News. The 505-hp Isuzu replaced a Detroit Diesel 2-stroke 12V71—1200-ft lbs of torque, rated 456 hp @ 2100 rpm. The first month the owner saved 100-125 gallons of fuel per day.

At $3 or $4 or $5 per gallon—you do the math!

Sources: Kodiak Diesel communications & July 2009/July ‘08 Fishermen’s News

**6WG1 Fuel Economy—The Proof is in the Repower**

The old, thirsty Cat D353, rated 425 hp @ 1200 rpm.

Jeanoah’s new UM6WG1WM-AB1K Isuzu on-deck: Tier-2 common rail, M-1 rated to deliver 505 hp @ 1,800 rpm.

She’s one of 800 Bender-built boats presently working worldwide: 82-ft long, 22-ft beam, 10-ft draft, haul-out wt 240,000 lbs, fish-hold capacity 130,000 lbs, holds 6,000 gal fuel, 1,200 gal water.

**Repower Under Construction!**

Charlie Madsen Photos

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**RISK FACTORS**

**Environment And Materials**

Marine hydraulics out on deck are at increased risk of corrosion damage from the harsh environment. Salt air, spray, and condensation are extremely hard on equipment, especially exposed pump and motor shafts—like on the crab block. When the hydraulic system’s working, many of its components get warm—driving moisture away from the metal surfaces but not the salt crystals left covering everything on deck. Heat only serves to concentrate the salt. When everything cools off, all those dry, salty surfaces draw moisture back like a sponge. An endless cycle; wind blowing across unprotected, salt-covered metal so oxidation of the dreaded corrosion—works with a vengeance.

Add to that the different corrosion potential for some metals & you can have some serious corrosion to guard against.*

**TROUBLE SPOTS**

**Motor Shaft**

A recently rediscovered innovation used by the Navy more than 50 years ago was designed to prevent corrosion on shafts exposed to weather. Grease dams keep air & water away from the area of the motor shaft that fails (Fig. 1), providing 100% protection when incorporated into the hydraulic motor’s mounting bracket.

First remove corrosion and thoroughly degrease fittings, then clean with a final rinse of acetone. Treat fittings with a rust neutralizer like Corroseal or Extend & let dry before wrapping all exposed metal.

When using bronze or stainless you’ll pay more up-front but it lasts much longer than bronze.

Stainless steel, however, is only stain-resistant, not stainproof. Ordinary stainless steels will corrode.

Stainless bolts, fittings, & hardware fall into 2 general categories: lip-type oil seal & SS Zerk oil seal.

**Control Valves**

Most marine control valves originated in agricultural applications. They work well when new but are extremely prone to rust and corrosion that make the valve spool lock or stick. A spool valve that doesn’t spring back & return to center when releasing the handle is dangerous—it can kill people, even sink boats.

Most control valves have cast-iron bodies and chrome-plated valve spools. A few valve makers do offer stainless spools—not always readily available but you can back-order if willing to wait. Rustproof control valves milled from a solid block of stainless steel are available in Norway, but pricey.

Marine conversion kits for the more popular control valves are available. Kits contain bronze handles and stainless spools, end covers, links and pins. Look for the kit or complete control-valve assemblies with a special coating on the cast-iron valve body. It’s hard to coat a cast-iron body properly after the iron’s been oiled; however, the same rules for prepping steel also apply to cast iron.

Rust often locks valves because internal clearances between the valve body & spool are so small—only 0.0003” (3 ten-thousandths of an inch!) on a chromed valve spool & body, 0.0008” on stainless—tolerances way too close for most to make their own stan- dards. Many valve makers have turned to chrome-plated steels or SS Zerk oil seal & are easier to uncouple after years of use on deck.

Before ordering a part be sure you know what you need, and you’ll be glad when you get the right part shipped.

**Fittings**

Avoiding rust on fittings helps if you need to take them apart later. The best time to stop corrosion is before it starts—when installing new fittings. To stop rust on new or used plain-steel or cast-iron fittings try PetroWrap, a fairly weatherproof tape impregnated with a tar-like substance (see box for metal options).

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** THREADS Review**

All fittings, couplings, and adaptors fall into 2 broad categories: tapered or straight threads—always mated tapered to tapered, straight to straight.

Tapered-Thread Fittings: (pipe-thread fittings, pipe fittings) come in plastic, aluminum, cast iron, steel, bronze, or stainless steel. Hydraulic hoses can have these crimped to both ends, or to one end with a straight-threaded coupling on the other. You must assemble tapered threads with thread sealant—use the right sealant for the metal, and always torque according to specs for yours online or check with hydraulic shops.

Straight-Thread Fittings: Crimp-on couplings can have straight threads and are available in steel, stainless steel, or bronze. Superior to tapered-thread couplings, they require no thread sealant & are easier to uncouple after years of use on deck.

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**Hydraulic Remote Operated (HRO) valves** are another option for dealing with rust. Mounted below deck to keep out of the weather, they’re still controlled from deck but by much smaller, less expensive valves with little, at risk for rust but usually much easier to maintain than larger conventional valves.

Fighting rust and corrosion’s a little like cleaning the deck iron. The deck iron is made of aluminum, steel, or stainless steel and is mounted on-deck to connect the above- and below-deck hydraulic systems. Hydraulic-oil passages through the deck iron connect to various hydraulic components out on deck. These couplings are exposed to the weather and should be protected.

Once cleaned and primed, coat steel deck-irons with marine-grade paint like 2-part epoxy paint, but epoxy needs some warmth to cure quickly.

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Rust often locks valves because internal clearances between the valve body & spool are so small—only 0.0003” (3 ten-thousandths of an inch!) on a chromed valve spool & body, 0.0008” on stainless—tolerances way too close for most to make their own standards. Many valve makers have turned to chrome-plated steels or SS Zerk oil seal & are easier to uncouple after years of use on deck.

Before ordering a part be sure you know what you need, and you’ll be glad when you get the right part shipped.

**Glue Plugs**

Having a hard time starting your diesel engine? Could be a glow plug.

We all know we have glow plugs & how to use them, but not all know how they work, how they fail, or how to troubleshoot. If your diesel engine’s cranking over longer on those cold mornings—could be a faild plug.

To help start your diesel a glow plug actually heats the air in each individual cylinder. With no spark plugs to ignite the atomized diesel fuel injected into each cylinder, a diesel uses heat from compression to ignite. The average compression ratio for Isuzu & John Deere is between 15:1 and 22:1—higher the compression ratio, higher the temperature of the compressed air.

Although of different types & shapes, most all glow plugs work the same, even air heaters installed in the intake manifold of some of today’s newer diesel engines.

To learn more check our BLOG for pictures & arrows & a paragraph on the back of each one (search Glow Plugs). Then if you’re not sure about how to check your own glow plugs or air heater, call us up, just ask for Herb.

*Galvanized Screws of metal potential. Therefore, it is often necessary to use a thread sealant & are easier to uncouple after years of use on deck. Before ordering a part be sure you know what you need, and you’ll be glad when you get the right part shipped.*

Full text by Service Manager Herb Knight on our blog

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**Technical text by Ben Evridge on MER’s blog; Editor’s thanks to Jonathan Biv for technical assistance.**
every user's asking, Should you use lubricity additives in this new Ultra-
Low Sulfur Diesel fuel, or not? The 2006 deadline for new Ultra-
Low Sulfur Diesel-fuel standards in the US has come and gone, and with it the expected loss of fuel lubricity as well as companion standards mandating the oil industry restore lubricity with additives. So we wouldn't have to worry about it.

Well, if only that were true. It is true that reducing sulfur from 500 ppm to 15 ppm decreased the fuel lubricity and corrosion inhibitors—and also decreased the sulfur-
dioxide emissions bad for all living things. It's true that engines and fuels systems need lubricity to prevent equipment damage and premature equipment failure. However, it is not true that the sulfur itself does the lubricating. Urban legend. It's the same oil-refinery process to reduce sulfur that also removes natural fuel-lubricity agents. Really—it's not the sulfur.

Diesel-fuel lubricity represents the ability to provide surface-contact lubrication that helps protect fuel systems. In diesel engines, rotary and distributor-type fuel-injection pumps rely on fuel as lubricant. Increasingly sophisticated diesel fuel-injection equipment runs at higher operating temperatures with high injection pressures, multiple injections, & finer tolerances—all requiring clean, lubricious fuel for performance & longevity. All true.

But the road to cleaner air emissions was paved with good intentions. Then the fuel industry lobbed for more relaxed lubricity standards, manufacturing industries compromised, & the bar got set pretty low.

Sulfur Diesel-fuel standards in the US has met expected lifetime performance and emissions targets. **

However, general industry agreement holds to the higher European standard of a 460-µm maximum scar. Fuel-injection equipment manufacturers got together and agreed: If over 460, their fuel-injection equipment might not meet expected lifetime performance and emissions targets.**

They also said if you put in additives to increase lubricity, take care to use the right additive—but not too much of it. Bad things can happen, like internal pump-plunger and injector deposits.

It's actually come to the point where even equipment manufacturers accept biodiesel as a proven nontoxic & superior lubricity agent without the adverse effects of overdosing on other additives. But you still can't get biodiesel in Alaska and it's unstable, so you can't store it or take it with you. Other than that, it's great.

We've put man on the moon, yet America's diesel engines rely on measuring a scuff mark on metal. Seems almost barbaric. Caveman tools.

So, should you use additives or not? Probably. It's like the swine-flu shot: Should you get it? Does it benefit? Are there risks? Take in all the information, ask around, make your own best decision.

And rest assured we will continue following this issue & revisit it here and on the blog again.

*Test details @ http://energy.gromark.com/Technifact/Bulletin79.pdf.*

**Position statement by manufacturers Delphi, Bosch, Denso, Continental, & Stanadyne @ http://rb-k.bosch.de/pool/pdf/fiem_common_position_statement_2009.*
IVAN FOX REMEMBERS ... UGANIK BAY

With Alaska canneries disappearing & “falling away into the ocean,” Bob Allen says he likes to hear father-in-law Ivan tell stories of the old days, so the stories don’t disappear too. Ivan recalls the NE Arm of Uganik Bay on Kodiak Island:

In early September 1946 I accepted a job offer from San Juan Fishing & Packing Co. as office manager at Port O’Brien where they owned & operated a salmon cannery. It is a well-sheltered port with deep water at the face of the dock & a good freshwater supply. Fresh water came from a lake at the top of the mountain behind the cannery. The runoff was tapped quite high up on the mountainside with a 10” water line to the cannery at 135 lbs of water pressure. The location for the other cannery in the NorthEast Arm of Uganik Bay, commonly known as the “Herring Plant,” was scouted out by the same guy “Roberts” who picked out the location for the Port O’Brien cannery for San Juan. Roberts later left San Juan & started his own company, Uganik Fisheries, Inc. Uganik Fisheries built their plant just 1/2-mile from Port O’Brien & operated it as a salmon cannery from 1927-1945. They had a big pile driver, 3 salmon traps & several small seine boats working for them around Uganik Bay. In 1945, San Juan lost their floating processor The Oganse to a torpedo attack during the War & with the insurance proceeds purchased the Uganik Fisheries Cannery & salmon traps. The plant sat idle in 1946 & reopened in ’47 as a herring-oil rendering plant, operating with a new boiler & equipment. There was a bitter labor strike in ’49 which was never settled & the plant didn’t see another fish after the 1948 season. San Juan kept the location for storage & used the marine ways to store the pile driver & seine boats over the winter.