

## Keeping The Wheels Turning



**Condition Based Maintenance** is the key to profitability in a highly competitive mining industry.

**Effective Maintenance Procedures** must be easy to understand, easy to implement, easy to repeat, and easy to track.

**Oil Sampling & Oil Analysis** continues to be the corner stone of condition based maintenance for lubricated machinery.

**Drawing a Reliable Oil Sample** from mobile equipment in a mining operation is always a risky business.

**The OILMISER™ (Severe Duty) Plug & Sampling Valve** manages the risk, and delivers the results.



Three basic issues impact the frequency of oil sampling and the confidence level in the results in a mining environment.

1. Prioritizing maintenance procedures for operating equipment can put oil sampling at the bottom of the list.
2. Sampling the oil on the inside means inserting a sampling tube through an open port from the outside.
3. The killers of rotating, lubricated machinery are dirt, dust, grit and water. Keeping it out is essential for machine reliability.

Heavy industrial wheel motors, planetary drives, and power train components, work in confined spaces, in dangerous and high traffic locations, where they are vulnerable to work place hazards and mechanical damage.

Oil fill ports, oil level ports and drain ports are fitted with low profile steel plugs, steel covers or protective steel guards. To draw an oil sample these plugs or covers must be removed and a sampling tube inserted. To reduce the risk of introducing more contamination, machinery must be thoroughly cleaned, and a clean work station organized prior to drawing an oil sample.

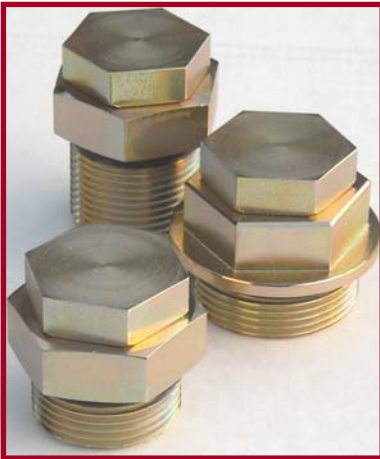


For the **OILMISER™ (Severe Duty) Plug & Sampling Valve**, only the immediate area must be wiped clean. Removing the sealed Steel Hex Cap, presents a large open cavity, with a clean Hi-Flow Sampling valve (SV-HF25) easily accessible. The sampling probe (SP-HF25), with a short length of sampling tube and vacuum pump quickly attaches by hand to the sampling valve. The oil sample is drawn, and the Steel Hex Cap is reinstalled. Job done, time, 15 minutes or less.



The **OILMISER™ (Severe Duty) Plug & Sampling Valve**

- **replaces the original steel plug**
- **reduces preparation & cleaning time**
- **eliminates the risks of an open port**
- **standardizes the oil sampling procedure**
- **delivers a reliable oil sample each & every time**



The **OILMISER™ (Severe Duty) Plug & Sampling Valve** is a three piece assembly.

1. A threaded **Steel Hex Plug** & external seal with a threaded inside cavity.
2. A **Hi-Flow Sampling Valve**, normally closed, recessed into the cavity.
3. A threaded **Steel Hex Cap** & external seal that threads into the Hex Plug cavity.

When fully assembled and installed, the Hex Plug Body and Cap protrudes 1 inch beyond the mounting surface. The low profile steel body and cap is well suited to the severe duty and hazards found in the off road work place, large external hex configuration with no female cavities that can peen over or get plugged with debris

**Drawing a Reliable Oil Sample**

When the Hex Cap is removed, a large, clean cavity provides easy access to the Hi-Flow (flush faced, normally closed) Sampling Valve (SV-HF25). The mating half of the sampling valve is the **OILMISER™ Hi-Flow Sampling Probe (SP-HF25)**. It connects quickly and easily by hand to the sampling valve. Only when the sampling probe is *fully engaged* with the sampling valve can lube oil be drawn out of the machine. The zero leakage sampling valve, resets when the sampling probe is disconnected.

A length of clean plastic sampling tube connects the sampling probe, to the vacuum pump and a clean sample bottle. This **closed loop** insures that no unrelated contamination can enter the oil sample. The resulting oil analysis delivers the level of confidence necessary for effective Condition Based Maintenance.

In some non rotating machinery, like gearboxes and differentials, the only available access port may be above the oil level, requiring an internal drop tube to draw an oil sample. For this situation, the threaded steel hex plug has an extended body with a 1/4" NPT back port. If the internal configuration of the gearbox or differential housing is suitable the Extended Plug & Sampling Valve can be an excellent option.



**Checking the Oil Level**

Part No.	Male Plug & Thread
PSV-SC12	Steel Cap SAE-12
PSV-HF16	Steel Plug SAE-16
PSV-HF16E	Plug (Extended) SAE-16
PSV-HF20	Steel Plug SAE-20
Contact factory for more options	

In many cases, the existing Oil Level Plug will be the only access port for drawing an oil sample from rotating machinery.

In addition to drawing a reliable oil sample, the **OILMISER™ Plug & Sampling Valve** can be used as a simple, safe, and accurate fluid level gauge on mobile machinery.

Insure that the Plug & Sampling Valve is below the manufacturer's recommended oil level. Remove the Hex Cap. Attach a short length of plastic sample tube to a Hi-Flow Sampling Probe (SP-HF25). Fully engage the sampling probe with the sampling valve in the plug, while holding the free (open) end of the sampling tube straight up. Lube oil will run up the plastic tube to the level of the oil inside the wheel motor. If no oil appears in the plastic tube, the oil level is below the sampling valve. The rate at which the lube oil runs up the plastic tube will vary with oil viscosity and oil temperature.





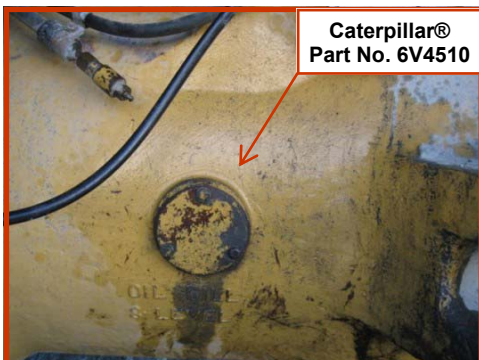
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### Inspection Covers & OILMISER™ Plug & Sampling Valve

On oil reservoirs, gearboxes and differentials, a cover plate or inspection plate may be reconfigured to accept an **OILMISER™ Plug & Sampling Valve**.

If the cover plate is above the oil level, an internal drop tube will be required to draw an oil sample.

The Caterpillar® 785 Haul truck is a typical application. The differential inspection cover P/N 6V4510 will be replaced with an **OILMISER™ Cover Plate** including a **(Severe Duty) Plug & Sampling Valve**.



This application will use a 6 inch drop tube and the (Extended) Plug & Sampling Valve ( P/N PSV-HF16E-DT62) to draw a reliable oil sample from below the oil level. The thickness of the casting and the internal curvature requires a minimum clearance behind the cover plate (for the 6" drop tube) of 2 inches. The "drop tube" can be cut to length and bent to suit the application on site

All parts and pieces of the cover plate, plug, and sampling valve are captive, eliminating the possibility of falling into the differential. The down tube and retaining nut are industry standards, and when properly assembled will not come loose.



Proper orientation of the down tube inside the differential after installation is essential. Metal to metal contact between the cover plate and the plug & sampling valve, will insure the position of the down tube, relative to the cover, plate when it is installed. It is necessary to specify the bolt hole location on the cover plate, ( i.e. 3 bolts, 4.25" BC, 1 bolt at 12 o'clock).

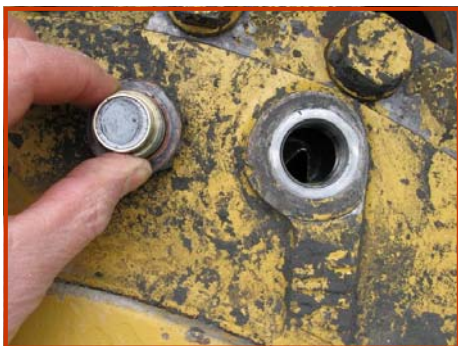
When the plug & sampling valve is tightened into the cover plate, the drop tube can be positioned at 180° down from one of the three bolt holes. The cover plate and the plug & sampling valve are metal stamped to identify orientation when positioning the down tube on site.



**The Next Generation OILMISER™ Sampling Valve. A True Game Changer****Why Change the Game?**

In a typical mining operation, maintenance records and cost analysis will generally show that the mine's mobile equipment can consume up to 70 percent of the total maintenance budget. Maintenance on heavy haul trucks will generally make up the largest percentage of these costs.

Work site maintenance procedures are so time sensitive that oil sampling does not make the to-do list on the regular 500 hour maintenance schedule. To draw an oil sample, an OEM oil plug has to be removed to expose a large open port. A 1/4" OD plastic sampling tube connected to a hand held vacuum pump is inserted into this open port. When the oil sample is complete, and the plastic tube withdrawn, the OEM oil plug is reinstalled. This procedure is too risky and too time consuming, in a typical mining operation.



In the absence of oil cleanliness data that would accrue from a running series of oil analysis reports, all lubrication and hydraulic oils are discarded and replaced with new oil at the 2000 hour Service, Maintenance & Overhaul schedule.

In 2008, JLM Systems introduced a severe duty oil sampling plug that could survive in this type of workplace. Where it was used, oil sampling was now quick, clean, and safe enough to be added to the 500 hour service program.



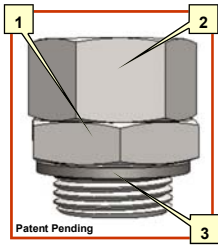
Supported by the data gathered, oil change out periods could be safely extended beyond 2000 hours to 4000 hours or longer without compromising the OEM warranty specifications for oil cleanliness.

However, some challenges still remained. All planetary final drives and differentials could not be easily accommodated. Where the OEM oil plugs are at or just above the oil level, a traditional oil sampling valve and mating quick disconnect, cannot be used.



### The OILMISER™ OIL Sampling Valves with “Pass Thru” Technology

The all new OILMISER™ Plug & Sampling Valve with “Pass Thru” technology (PSV-PT) is also designed to replace the original OEM oil plugs. It can expand the oil sampling program to include those planetary final drives and differentials that still remained outside the 500 hour maintenance & service schedule.



The OILMISER™ PSV-PT includes a plated steel threaded hex plug (1), a plated steel hex cap (2) and a bonded rubber plug seal (3). The steel hex cap mates with a raised threaded boss (4). When the hex cap is fully engaged on the hex plug, a captive O’ring (5) seals the steel body & cap against any outside contamination getting inside the machine.

Removing the sealed hex cap exposes a machined cavity recessed into the raised boss. Held captive within this machined cavity is a tube seal/wiper and a brass gland bushing. This presents a very clean and well defined access hole for inserting a ¼" OD sampling tube directly into the interior of the machine. The backside configuration of the PSV and the natural curl of plastic tubing directs the oil sampling tube downward and into the lube oil. When the oil sample has been drawn, the sampling tube can be extracted. The tube seal/wiper strips the outside surface of the plastic tubing clean of any residual lubricating oil. Oil sampling is now a safe and clean procedure, even in dirty workplace conditions. When the hex cap is replaced, the integrity of the machine is restored, and completely sealed against outside contamination getting inside and inside lubricating oil getting outside.



The fundamental premise behind PT technology is in the recognition that drawing an oil sample from rotating lubricated machinery is, and will remain, a necessary and indispensable maintenance procedure for extending the life and reliability of lubricated machinery.

### The Proof is in The Details

An article by the Noria Corporation provided hard evidence in support of an expanded oil sampling program.

A two year study by a mining division of J.R. Simplot Company was initiated to monitor and control contamination levels in lubricating oils. The mandate was to extend the life of the lubricating oils used in differentials, final drives and hydraulic systems from 2,000 hours to 6,000 hours.

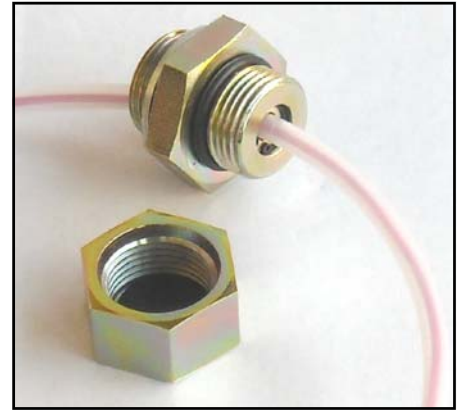
To this end, the program called for all the mine’s mobile equipment to be inspected, including oil samples drawn, and analyzed every 500 hours.

Following this regimen, the average final drive life cycle at this mine site is now up to 12,917 hours; up 42% from the pre-study average life cycle of 9,116 hours before a rebuild.

Since the program began, mine personnel calculate that the company has saved over 22,000 dollars on new oil purchases alone, and without factoring in manpower and a host of other associated costs, which can amount to several times the actual new oil cost.

(Sharon Dory, J.R. Simplot Company Teresa Hansen, Noria Corporation  
Tags:contamination control : Practicing Oil Analysis 7/2003)





**OEM REPLACEMENT PARTS**

JLM Systems adds Pass-Thru Technology to our family of Severe Duty oil Plugs & Sampling Valves

In heavy, mining and off-road equipment many OEM oil fill plugs are at or just above the inside oil level. Conventional oil sampling valves including OILMISER™ severe duty plugs, must be below the oil level. To draw an oil sample, the OEM plug has to be removed and a ¼" OD plastic sampling tube connected to a hand held vacuum pump inserted into the open port. Such a procedure is too risky and too time consuming to be practical in this fast paced work place.



Patent Pending

The new OILMISER™ PSV-PT oil sampling plug with its low profile rugged construction, replaces the original OEM oil plug. Removing the steel hex cap exposes a very clean and very well defined access hole for inserting the oil sampling tube directly into the machinery. When the oil sample is complete, the oil sampling tube is drawn back through the inner tube wiper/seal which strips the tube of any residual lube oil. When the hex cap is replaced, the O'ring seal ensures that outside contamination can't get in, and inside lube oil can't get out.



The new PSV-PT is now offered on OILMISER™ OEM replacement inspec-

