

Getting into the ROUTINE *Maintenance, that is.*

By Alastair Brennan

“If it ain’t broke, don’t fix it.”

That’s a frequent comment from those who use things mechanical. While that approach seems logical, in reality, a little routine maintenance will keep those mechanical things from ending up “broke” in the first place. Things with moving parts need to be taken care of, and should be inspected routinely to ensure they stay up and running.

Machine tools definitely have lots of moving parts, and when your machines aren’t up and running, you’re not making parts – or money.

Every time you jump into your car, you probably look at the gas gauge to make sure you have enough fuel to get where you’re going. But before you turn the key, do you ever look at the voltmeter and ask, “Do I even have enough juice in the battery to start the car?” You probably don’t ever think of that. Why would you? The car worked fine yesterday.

But then you drive by someone on the side of the road with their car’s hood up. Do you ever wonder what went wrong? I’m sure they thought “the car worked fine yesterday,” too.

Just like your car, machine tools need some basic maintenance to keep them from “stopping on the side of the road.” Moving parts need to be lubricated, fluids need to be refilled, filters need to be checked – routine maintenance is necessary to keep these machines performing just like new.



The engineers at Haas have done their best to make machine maintenance as simple as possible. Handy items like a coolant-level sensor, which gives the operator an on-screen indication of the coolant level, ensure that more time is spent using the machine than working on it or tuning it up.

Haas engineers have also addressed things that normally are taken for granted, like separating water from the machine’s air supply. Not only do Haas machines have the obvious air filter and regulator, they also have a not-so-obvious dump valve that collects any water that may be in the machine’s air supply, and then purges it each time the air blow gun is used. This does two things: 1) It purges the water from the line (I just said that), and 2) The subsequent discharge of water through the air gun alerts the user that there is a problem with the air supply.

Other areas of maintenance, however, require a bit more effort on your part. Here are some of the key areas you should address.

Safety First!

Before doing any maintenance, power off the machine and switch the main breaker on the control cabinet to the “Off” position. (Refer to your shop’s lockout procedure for proper shutdown.) Everyone should know coolant and electricity don’t mix; that’s pretty obvious. But remember, YOU and electricity don’t mix either, especially when it’s 480 volts!

General Housekeeping

Wipe down the outside of the machine, including the top; you’ll be surprised at how much dust, grime and chips accumulate on the horizontal surfaces of the machine. Eventually, this grime will find its way into the machine’s enclosure and contaminate the coolant. Or worse, it will work its way into the electrical cabinet, which definitely is no place for metal chips (it’s that whole electrical-conductivity, sparks-flying, shorted-whatnots, magic-smoke thing – not good).

While you’re at it, clean the inside of the machine. If the machine is equipped with a wash-down hose, use it to wash the chips and grime from the machining process into the auger trough. NEVER use compressed air to clean the inside of a machine – not only does it put you at risk of flying chips, it can also cause chips to become wedged under the way covers and in the spindle, where they can cause all kinds of trouble.

Safety Windows

The windows (transparent guards) of the machine can be weakened by exposure to certain cutting fluids and chemicals. The most harmful of these fluids are those containing amines. Your coolant supplier can provide more information about the different coolant types and their ingredients.

When using coolants that contain harsh chemicals, be aware that the windows can lose up to 10% of their remaining strength annually. Therefore, you should give definite



thought to replacing the windows regularly. We recommend an interval of every two years. Obviously, if windows and guarding become damaged or severely scratched, they should be replaced. Cracked windows should be replaced immediately!

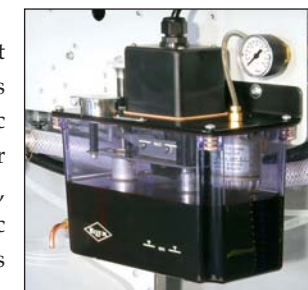
Lubrication

All Haas machines (except Toolroom and GR series machines) feature an automatic lubrication system for the linear guides, ballscrews and spindle, each of which requires a specific amount of lube. Again, Haas engineers have made this process simple for the owner: Keep the reservoir full and the machine takes care of the rest. The system automatically lubricates all critical points through metered orifices, ensuring that each component gets the proper amount of oil. It is activated by the CNC control at regular intervals.

The auto-lube system consists of a pump, a reservoir and an inline filter, which are located on the air/lube panel at the back of the machine. Check the reservoir daily, and top it off when necessary with the lube oil recommended in your operator’s manual. The reservoir holds about 2.5 quarts, so be sure to have enough on hand. The inline filter is located inside the reservoir and should be changed each year, or every 2000 hours of machine cycle time. While it’s not the easiest filter to change, the extra time you spend making sure it’s clean will save you from unnecessary repair bills and downtime later.

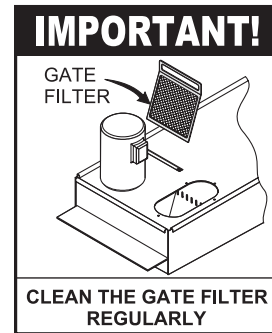
Coolant and Coolant Tank

The coolant level should be checked at the beginning of each work shift. As mentioned earlier, a coolant-level sensor and on-screen indicator show the level of coolant in the tank. This feature is standard on all Haas mills and lathes that have a separate coolant tank (except Toolroom machines and Mini Mills). The coolant level is displayed on the first Current Commands page (the page that displays the current program).



If the coolant reaches a low level, the warning indicator will flash. At this point, coolant must be added to avoid pump cavitation and intermittent coolant flow.

The Ebb and Flow of Coolant Tanks



The Haas coolant tank has a built-in coarse screen before the pump that should be cleaned at the start of each week. The coolant tank itself should be cleaned weekly as well. To do this, remove the tank lid and wipe out any sediment that has collected. The design of the tank forces the coolant through a series of baffles as it makes its way back to the pump. These baffles give any sediment or small chips suspended in the coolant time to settle out. Be sure to wipe out all areas of the tank.

Coolant Filters

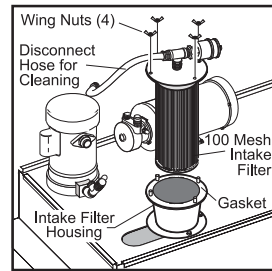
Haas machines are equipped with a cartridge filter for the standard coolant system, and an additional cartridge filter for the optional through-spindle coolant system (mills) or high-pressure coolant system (lathes). The filter housings are mounted on the machine enclosure near the coolant pump/tank. Indicators on the housings visually show when the filters need to be cleaned. The filters should be inspected daily, and cleaned when the indicator shows limited flow.

On mills with TSC and lathes with HPC, you must prime the system after changing or cleaning the filter. To do this, run the system for at least one minute to fill the filter body and purge any air from the system. Note: When priming the system on mills, do not have a tool in the spindle.

Replacing Coolant

Coolant should be replaced every six months. Drain the coolant and dispose of it properly. Abide by local rules and regulations, as most types of coolant are considered hazardous waste.

While the coolant tank is drained, it is a good idea to remove the lid and thoroughly clean the inside of the tank, as



well as the screen and pump housing. Also check the coolant hoses for leaks or cracks, and replace them as necessary. Automation's 99% same-day-shipment goal for service parts ensures you'll have replacement parts quickly.

Types of Coolant

Use only water-soluble, synthetic-based coolants in your Haas machine. Using mineral cutting oils will damage rubber components throughout the machine. Using straight water as a coolant can cause internal machine components to corrode (rust). And – this really should go without saying – DO NOT use flammable liquids as coolant! Trust us on this one. Machine tool flambé can really ruin your day.

Machines with Transmissions

Transmissions also need minor attention. To keep the gearbox running smoothly and quietly, the transmission oil needs to be changed once a year. Like the transmission in your car, there's the usual drain plug on the bottom. Grab a bucket, remove the plug and drain the used oil (be sure to dispose of the used oil properly). Replace the plug (this part's really important) and refill the transmission with the proper type and quantity of oil. Your operator's manual will list the type of oil required for your machine.

Mill Spindle Pressure

The spindles on Haas mills are pressurized to facilitate the flow of lubrication to the bearings. This positive pressure also helps keep chips and coolant from entering the internal spindle taper.

Check the air pressure each week; the regulator is located at the back of the machine on the air/lube panel. Again, you can find the correct pressure setting for your specific mill in the operator's manual. Note that optional spindles sometimes have a different pressure setting than the standard spindle. Look for notes regarding this in the operator's manual.

Toolroom Machines

These simple machines do not have fancy enclosures or automatic lubrication systems like other Haas machines, but they need to be cared for nonetheless.

The linear guide trucks are lubricated manually using a grease gun. To make this task simple, grease fittings (zerks) are located at easily accessible points – there's no need to remove panels. Not only are these machines easy to work with, they're easy to work on, so there's no excuse for neglecting their critical moving parts.

Do not overgrease, however – it damages the seals. Two strokes of the grease gun are sufficient.

Tool Changers

Tool changers on Haas mills come in two flavors: side-mount and umbrella. The side-mount style has a gearbox, so, of course, there is oil to check and top off. Also, the tool-change arm (double arm) should be wiped off regularly to prevent chips from building up on its flat surfaces. Chip build-up may cause the tool changer to drop a tool, which tends to be bad for the tool, the workpiece, the table and, quite possibly, the operator.

The umbrella-style tool changer needs to be wiped down and lubricated; this should be done each month. When cleaning, be sure to clean any chips or grime from the V-rails the tool changer moves on. A build-up of chips here can cause tool changer jams.

Lubricate the umbrella-style tool changer by removing the tools and lightly greasing each of the tool changer fingers. Also lightly grease the V-rails.

Periodic Maintenance (On-Screen)

So, let's say remembering to check this and do that on your machine isn't your top priority when you walk into the shop in the morning. The phone is ringing, customers are expecting parts, you haven't had your daily dose of caffeine yet . . .

The software engineers at Haas understand your plight, and have tried to ease the chore of remembering when you last checked the way lube, coolant filter or anything else. The user-friendly Haas CNC control

features a periodic maintenance page that makes taking care of the machine worry-free. It's like an electronic Day-Timer that reminds you to perform the routine checks your machine requires.

In the Current Commands display, PAGE UP three times to find the Maintenance screen. You'll find a list of items that are tracked by either accumulated power-on (ON) or Cycle Start (CS) time.

An item on the list can be activated or deactivated by placing the cursor on that line and pressing ORIGIN. When an item is activated, the control will enter the default value (number of hours), which may be adjusted by the operator. When any activated item reaches zero, the message MAINTENANCE DUE will appear at the bottom of the control screen. This is not an alarm, and will not interfere with machine operation; it simply alerts the operator that one of the items on the list requires attention.

In Closing

All of these recommendations are guidelines; your machining techniques or work volume may require more frequent upkeep. Your Haas operator's manual discusses machine maintenance in detail, and gives machine-specific service information on some additional items that need to be checked, such as the hydraulic power unit for Haas turning centers.

Doing it yourself is always a good idea, but it may not be practical for many of you, both in the sense of time and money. That doesn't mean you should avoid routine maintenance schedules. Better, contact your Haas Factory Outlet – they can set you up on a preventive maintenance program. A factory-certified Haas service technician will show up at your shop and perform a complete maintenance routine while you do something else.

We've covered a number of topics here – if you need more information, or replacement parts, contact your local Haas Factory Outlet or the Haas Service department. 