Preventive Maintenance Saves Time & Money

Compared to the mechanical problems and costs incurred with alternate methods, belt drives are the most cost-effective, reliable means of HVAC power transmission.

The potential for long service life is engineered into every Gates belt. However, optimum belt drive performance requires proper maintenance. A regularly scheduled maintenance program is critical for your belt drives to run trouble-free for maximum service life.

A scheduled preventive maintenance program will help you avoid costly downtime due to unexpected or catastrophic failures. A comprehensive, effective program consists of several elements:

- Maintaining a safe working environment
- Scheduling regular drive inspections
- Following proper belt installation procedures
- Troubleshooting problem belt drives
- Performing drive performance evaluations
- Storing and handling belts correctly
- Receiving ongoing product training

Maintaining the proper airflow can be, and often is, critical. A well-maintained drive system is more efficient, saves energy and delivers the power you need, when you need it. Plus, a properly maintained system will also extend the life of accessory drive components.

How Often Should Belt Drives be Inspected?

This is a common question, and there are multiple "correct" answers. If a belt drive is critical to a key operation, then inspection should probably occur at least once per month, and potentially, once per week. Operating characteristics such as very high speeds, frequent stop-starts and high environmental temperatures all contribute to reduced belt life. Exposure to contaminants and debris also increases the risk of premature belt failure. If any of these conditions exist, drive inspections should occur more frequently.

General inspection should occur continuously. You should constantly be using your eyes and ears (even your nose) to observe a drive as it is operating. Certain conditions can be observed without shutting down the drive. Unusual vibration, noise or smells are all indications of a drive that may need attention.

Follow Proper Inspection Procedures

Before beginning an inspection, remember to follow safe "power-off" procedures. Turn off power to drive, test to make sure proper switch was thrown, lock out access to power switch, then tag switch. Make sure machine components are in a neutral or safe position so unexpected movement cannot occur.

Next, remove the guard. Use safe lifting procedures, and get additional help if necessary. Inspect guard for damage and other signs of wear or interference with drive components. To gain easier, safer access to belt drive, loosen take-up bolts to provide slack to belt, then slip belt over pulleys.

Visually examine belt for signs of unusual or uneven wear. Worn edges, cracking or chunking all indicate potential problems. If these or other signs of wear are present, replace belt.
Even when belts are to be replaced, never pry belts off. You could damage pulleys or cause serious personal injury. The safest procedure is to loosen tension so belt can slide over pulleys. Another technique is to carefully cut belts to ensure belts will not be re-used.

Always use gloves during sheave inspections. Carefully check each pulley for nicks, gouges or burrs. Nicks and burrs often have extremely sharp edges that can cause painful and serious cuts. If nicks or gouges are found, repair pulley if possible. Replace pulleys if effective repairs cannot be made.

If sheave grooves have been coated with dirt or rubber debris, carefully remove coating with fast-drying solvent that leaves no residue. Be careful there are no sharp nicks or gouges that may cause painful cuts to fingers or hands. Do not use cleaner that leaves a residue that may impact belt performance or life.

Using the proper sheave gauge (combination of the correct profile and O.D. range), check for wear. If 1/16” gap between sheave sidewall and gauge is detected, replace sheave. Worn sheaves dramatically shorten belt life.

When installing sheaves, DO NOT use lubricants between shaft and bushing or shaft and sheave, and DO NOT use lubricant between sheave and bushing. Lubricants can allow assembly to be overtightened, causing cracking or undue stress on components leading to premature sheave failure.

Make sure new pulleys and belt are all of the same profile. Sheave or sprocket type (profile and size) will be stamped on side of pulley. When using multiple belts, make sure they are a matched set and from the same manufacturer. With Gates V80® belt matching system, this is a simple process. All Gates V80 V-belts will run (are matched) with any other Gates V80 V-belt of the same profile, length and construction.

**Proper Drive Alignment Procedures**

When installing sheaves, attention should be paid to alignment. There are two types of misalignment: angular and parallel. Remember, drive alignment can be tricky if all parts of drive system are not installed properly.
An easy way to gauge parallel and angular alignment is with a straight edge. If four-point contact is achieved at two different positions on the sheaves, the sheaves are properly aligned. Another option is Gates new easy-to-use EZ Align® laser alignment tool that ensures greater precision in the alignment process.

**Proper Belt Installation Procedures**

Let’s now look at proper belt installation techniques. Taking the time to install belts properly will pay off in the long run. Belt life will be longer, and there will be less chance for catastrophic failure. It takes just a few extra minutes to do the job properly and save money later.

The first step is to select the proper belt type and size. If belt has no identification, you must identify belt top width and length in the case of V-belts, and width, length and pitch for synchronous belts. Gates has several publications that list accurate belt dimensions.

The second step is to loosen the mounting bolts to allow the belt to slip over the pulleys. Never pry belt onto pulleys. Prying can weaken the belt, damaging the edge cords or rupturing the tensile cords. If this happens, the belt’s expected life is severely reduced. There is also a risk of personal injury.

**Proper Belt Tensioning Procedures**

How do I ensure belt has sufficient tension? Simple, just measure to make sure it meets the tension force requirement for the drive configuration and capacity. This required force can be calculated using the formula in the appropriate drive design manual, read from the table in the Industrial Belt Preventive Maintenance manual, or obtained from the Design Flex® program. Gates drive design program can be downloaded for free at www.gates.com/designflex.

Pictured is Gates popular pencil tension tester. It uses the force/deflection method for measuring tension on a belt. The pencil gauge is also available in two-barrel and five-barrel models for larger force requirements.
Use Gates Sonic Tension Meter to check tension on synchronous belts. After proper tension is achieved, alignment should be re-checked and adjusted if necessary, then tension re-checked. Alignment and tensioning is a repetitive process, and may require some tweaking to achieve proper alignment and correct tension. After proper alignment and tension is achieved, rotate drive a few turns by hand (if possible). This helps belt take its initial "seat" in pulleys. Re-check tension and adjust, if necessary.

**Final Drive Adjustments & Observations**

You're almost done! After making sure all fasteners are secure and tightened to their proper values, re-install drive guard. Take proper steps to re-start drive and monitor its startup. Ensure there is no excessive vibration or noise. To help maximize belt life, run belt under load for a short period of time, then re-check tension. It will almost surely have loosened below recommended value. This simple step will add a significant number of hours to belt life.

**Schedule a Preventive Maintenance Seminar Today**

Your local Gates representative can assist you in developing or polishing your own belt preventive maintenance program. Contact your representative to schedule a "Belt Drive Preventive Maintenance Seminar" today.

Separate from, or in conjunction with, the "Belt Drive Preventive Maintenance Seminar," your Gates representative can assist you in conducting a "Site Survey." This survey may include drive inspections to uncover current or potential problems, or computerized drive analysis utilizing Gates exclusive Design Flex software to ensure drive has sufficient capacity.

Remember, whatever your belt drive requirements, Gates has your solution!

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