INSTALATION AND MAINTENANCE

1. PULLEYS

a) Before installing or replacing any belts, always inspect the pulleys for rust, oil and dirt. Remove the pulleys from the machine to inspect and then clean each pulley and wipe clean of any dirt, oil and grease.

b) If your pulleys are worn, then belt life will be substantially reduced. So inspect the pulleys for wear by using an approved pulley groove gauge. Check also that the pulley grooves are free from any sharp edges or scoring. Worn grooves will cause the belt to bottom out, which will result in slippage. In addition, the belts may burn or char. If the sidewalls are dished out, the bottom shoulder of the pulley will wear the bottom corner of the belt, resulting in premature failure.

c) Proper alignment of the pulleys is essential to maintain long belt and pulley life. Misalignment will cause belt flank wear. Ensure that both the shafts and pulleys are parallel and in alignment.

2. MIXED BELTS

a) Never install new with old belts-- replace all belts with new CMW Power Transmission belts, otherwise the new belts will be overloaded.

b) Never install CMW Power Transmission brand with another brand—replace all belts with CMW Power Transmission.

c) Never install one CMW Power Transmission construction with another construction—eg an envelope with a cogged raw edge type. replace all belts with the same CMW Power Transmission construction

Why - because Belt brands/construction and age will be different in performance and characteristics?

All CMW branded belts of the same construction/marking/reference are fully matchable

3. CORRECT INSTALLATION OF CMW POWER TRANSMISSION BELTS

a) Turn off and lock out the power source before changing or installing any belt. Always move the driver unit forward so the belts can easily be slipped into the pulley grooves without damage to the belts.

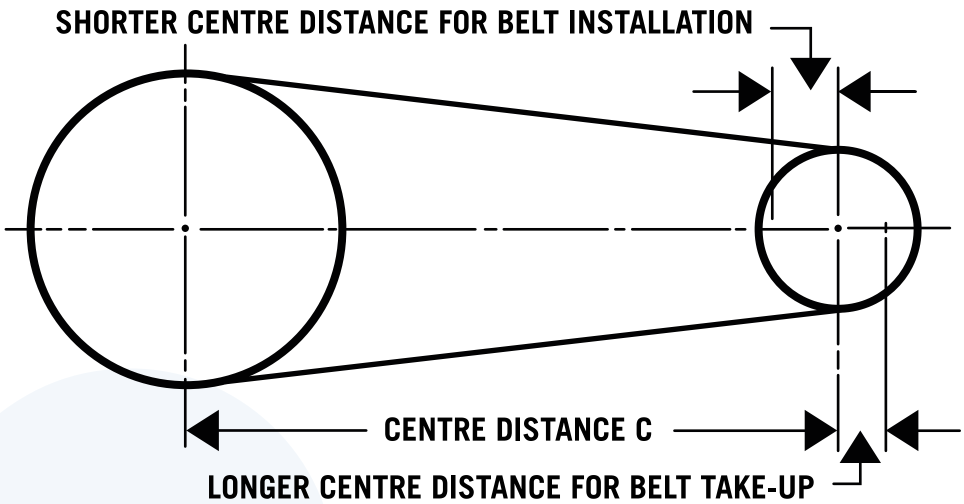
b) Never use a sharp tool, screwdriver or lever to prise or force the belts into a pulley groove as you risk a rupture the envelope or top cover fabric of the belt and break the edge cords. A belt so fitted will invariably turn over in its pulley groove.

4. CENTRE DISTANCE ALLOWANCES FOR BELT INSTALLATION AND TAKE-UP

a) After calculating a centre distance from a standard pitch length make provision that the centres can be moved closer together by the amount shown in the following table to facilitate installing the belts without injury. Also, the centres should be adjustable over the calculated distance by an amount as shown in the last column of the table because of manufacturing tolerance and possible stretch and wear of belt.

b) Slack-off - lower limiting value (for belt installation): nominal centre distance minus 1.5% of datum length of belt.

c) Take-up - higher limiting value: nominal centre distance plus 3% of datum length of belt.



Note: Providing that the drive was designed correctly and that any adjusting slides and pivots are maintained, then there should be no problem fitting correct length belts.

V and wedge belt drives are universally recognized as extremely reliable and provide an efficient means of transmitting power between prime mover and machinery.

As they are generally trouble-free, they are often left to run without checking and so if there is a problem, they do not realize their full efficiency, performance and belt life.

SAFETY NOTE:

• Always shut off power and lock our source of power to your drive motor before attempting to repair or clean any parts.

• Belt drive systems should only operate with a guard of suitable mesh material to ensure good ventilation and allow for incidental belt flap.

1. DIRT

Avoid operating your equipment in dirty conditions as much as possible. Dirt accelerates belt wear and any dirt build-up in a pulley groove impairs traction.

2. OBSERVE

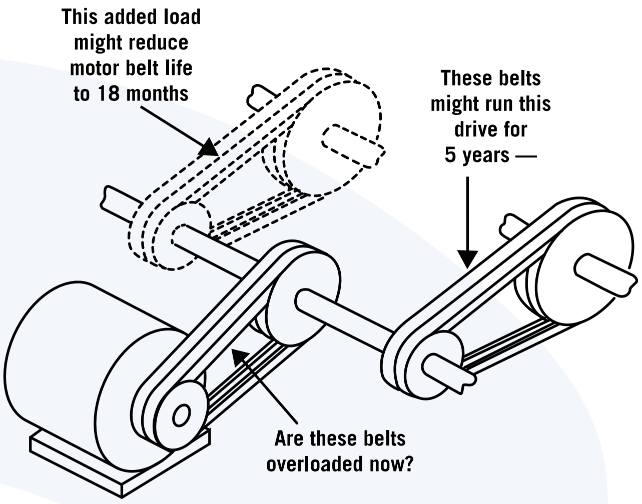
Good belt drive maintenance requires you to observe and listen to the belt operation and take the appropriate action to correct any drive problems.

After your installation of belts, inspect the drive and observe it while it runs.

a) OIL AND GREASE
Belts exposed to oil in spray, liquid or paste form fail prematurely. Excess oil on a bearing will splash on the belts and so the bearing should be repaired or replaced. If these conditions cannot be corrected, special CMW oil-resistant belts should be used.
However too little oil will cause bearing failure which may causes belts to burn out due to overload.

b) SQUEAL
Belt Slippage is often an issue if there is a squeal noise during motor acceleration or when the motor is operating near or at full load.
Squeal usually is a result of insufficient belt tension. If it persists after all belts have been checked and the tension adjusted, the drive itself should be examined for over-loading.

c) SQUEAK
If you hear a noise like a squeak, it indicates a problem of dust. Do not apply a dressing or oil to a belt in an effort to eliminate suck a squeak. Instead check, and if necessary, re-align the idler. However, note that squeak will not harm belts.



Added loads shorten belt life. A check should be made to see that no additional loads have been added since the original drive was selected.
Take note of the drive system shown in the following illustration.

4. CRACKING

Bottom cracking will not reduce the tensile strength or the operating efficiency of the belt. High temperatures, small diameter pulleys and dust will accelerate bottom cracks. Bottom cracking can be reduced by using larger pulleys and larger reverse bend idler pulleys. It is not necessary to replace a belt simply because bottom cracking has been observed.

5. BELT DRESSING

Do not use Belt Dressing.
If increasing belt tension fails to eliminate slip/squeal, replace Belts and/or Pulleys.

6. TENSION

Adjust tension to correct values

7. HEAT

CMW Power Transmission belts are cured in a scientifically controlled time and temperature process. Belts operating in temperatures of less than 70° C are not materially affected; however, at higher temperatures overcuring takes place and shortens belt life. Belts operating in temperature above 70°C should be checked frequently and a special heat-resistant construction should be considered if belt life is not satisfactory.

8. BELT TURN OVER

Turned over belts indicate conditions of drive misalignment, worn pulleys or excessive vibration.

9. CHANGE IN RIDE OUT

Change in ride out indicates uneven belt wear or worn pulleys.

10. BELT WEAR

Wear on sidewalls indicates constant slippage, excessive dust, or worn pulleys.

11. FOREIGN MATTER

Broken belts or excessive wear can result from the presence of foreign material. Clear all parts.

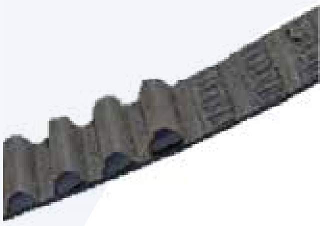
FAILURE AND TROUBLESHOOTING GUIDE

It is important to inspect your system every time you replace a belt in order to make sure your machine is working in optimum conditions. This not only will extend the life of many components including the belts but will also save your money in costs of operation and down time.

The fastest way to inspect your machine for problems is to verify the condition of the old belts you are replacing

1. Missing cogs

- Excessive heat
- Sheaves too small or misaligned
- Improper or prolonged belt storage: check with manufacturer.
- Back side idler too small



2. Belt swelling

- Belt is being contaminated with external substances like oil that softs the rubber.

3. Cracked Belt

- Pulley diameter too small and drive need redesign
- High temperature
- Belt slippage that requires drive tension
- Back side idler too small

4. Chunk cuts with cracking

- Severe back bend idler
- Improper or prolonged storage.

5. Sidewall Wear

- Pulleys misalignment.
- Worn or damages pulley
- Presence of dirt on the pulleys and belts
- It could be also evidence of normal wear.

6. Glazed belt

- Belt slippage due to lack of tension, oily drive conditions, overloaded drive or sheave worn.
- Under designed drive that cannot carry the load or shaft movement caused by movements in the center distance between the pulley.

7. Slip or spin burn

- Belt slips under starting or stalling load.
- Load miscalculated and a drive bad calculated as a consequence.
- Belt too loose.

8. Premature failure

- Could be cause by extreme shock load which will require drive redesign.
- An object falling in to the drive.
- Damaged tensile members due to operator pry or roll the belt on to the drive during installation.

9. Wear on the top corners

- The belt is too small for the groove in the pulley

TENSIONING METHODS

CALCULATING BELT TENSION

If your belt tension is too little, the belt will slip, which then generates heat, high belt temperatures and premature ageing of the belt.
Excessive heat will result in degradation of the rubber compound which will reduce the service life of the belt
Conversely, if your belt tension is too high, the belt will not slip, but will result negatively on the service life of the bearings and the belt

When tensioning a belt, two values should be considered:

1) Tused (run-in) is minimum tension on the belt that ensures minimum slip on the drive. Belt tension should ideally not drop below this value during the entire belt service life

2) Tnew (initial) is maximum tension in the belt, used to initially tension a new belt. Tnew normally decreases during the first hours of operation releasing initial high bearing loads

GENERAL TENSIONING VALUES

Tensioning values for general tensioning purposes are provided by the operating manual for selected tensioning tools. The values represent the "worst case" drives and as such, tend to be higher than the values calculated for a specific drive.

CALCULATING TENSION VALUES

In cases where all drive data is available, it is possible to calculate the required tension instead of using the general tensioning values.

To calculate tension values, the following procedure should be used:

a) Find the minimum required strand tension for used run-in belts using the formula

$$v = \frac{dn}{19100}$$

where:
v = belt speed [m/s]
d = pulley datum diameter [mm]
n = speed of driver pulley [r/min]

$$T_{used} = 510 \frac{(2{,}2 - C_3)\, P_{d)}}{(C_3\, Nv)} + \frac{Mv^2}{1{,}11}$$

Where:
Tused = minimum required static tension in one strand of the belt [N]
C3 = arc of contact correction factor
Pd = design power [kW]

N = number of belts on the drive
v = belt speed [m/s]
M = belt weight per unit [kg/m]

b) Increase Tused value by 50% to get initial required tension on a new belt Tnew

$$T_{new} = 1,5T_{used}$$

c) If a pen tester is used to tension the drive, calculate belt deflection force
For single V-belts and single units of banded and ribbed belts:

$$F_{d\,used} = \frac{\frac{T_{used}N}{16} + \frac{NKS_p}{L}}{9,81}$$

$$F_{d\,new} = \frac{\frac{T_{new}N}{16} + \frac{NKS_p}{L}}{9,81}$$

For multiple V-belts or matched sets of banded and ribbed belts:

$$F_{d\,used} = \frac{\frac{T_{used}N}{16} + NK}{9,81}$$

$$F_{d\,new} = \frac{\frac{T_{new}N}{16} + NK}{9,81}$$

where
Fd used, Fd new = deflection force for a used run-in respectively a new belt [kg]
Tused, Tnew = required strand tension for a used run-in respectively a new belt
N = number of belts (for single V-belt N = 1) or number of belts in a band
K = belt modulus factor (see table below)
Sp = span length of the belt [m]
L = reference length of the belt [m]

Belt modulus factor	
Section	**K**
Z, ZX	2,65
A, AX	2,92
B, BX	3,89
C, CX	5,85
D	8,08
SPZ, XPZ, 3V, 3VX	2,91
SPA, XPA	3,15
SPB, XPB, 5V, 5VX	4,06
SPC, XPC	6,27
8V	7,62