MASTERDRIVE

Installation

1. Clean sheaves/pulleys, and remove dust, dirt and oil.
2. Check for worn grooves using sheave gauge.
3. Use correct belt for sheave size
4. Never “roll” or “pry” the belts into the sheave grooves. Move the driver unit to allow belt to slip on easily.
5. Check alignment. Drive shafts must be parallel.
6. Rotate each sheave to check for wobble or bent drive shaft.
7. Tighten the belt take-up and then run the belt 10 minutes. Recheck and adjust tension, using tables on reverse.

Warning

When servicing a drive, be certain machinery is SHUT OFF and properly prevented from accidentally starting. Do not wear loose clothing, jewelry, etc. Keep guards on machinery when it is operating.

Rapid Belt Failure

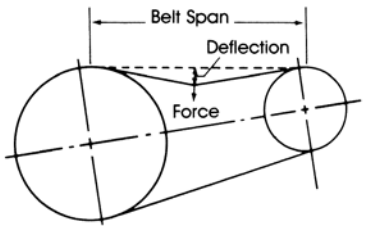
SYMPTOM	CORRECTION
Belt cover wears rapidly	Replace sheaves
Slip burns-shiny sheave grooves	Increase tension
Belt hard and cracked	Heat condition; Ventilate drive; Check tension
Belt sticky or soft	Eliminate oil

Belt Tensioning

STEP 1: After measuring the belt span (see sketch) use a belt tension tester and apply perpendicular force to any ONE of the belts at the span mid-point. Measure the force required to deflect any of the belts 1/64 inch for every inch of span length. EXAMPLE: A 32” span deflection would be 1/64 inch x 32 or 1/2 inch.
Note: When new belts are installed on a drive, the tension will drop rapidly during the first few hours. Thus, for new belts, multiply the maximum deflection force shown in the tensioning tables by 1.33. Check tension frequently during the first 24 hours of operation. Subsequent retensioning should fall between the minimum and maximum forces shown in the tables.
STEP 2: Compare Step 1 deflection force reading with range of force in the following tensioning tables. If the force is below the minimum after any adjustment per above note, then the belts are too loose.

If the force is greater than the maximum after any adjustment per above note, then the belts are too tight.

Readjust measured drive tension until the deflection force is between the maximum and minimum values shown in or calculated from the respective tensioning tables.



Classical V-Belt Tensioning Table

Belt	Small Sheave Dia. Range (inches)	Small Sheave RPM Range	Speed Ratio Range	Belt Deflection Force in Lbs.			
				Classical		Classical Cogged	
				Min.	Max.	Min.	Max.
A*	2.2	1750 to 3600	2.0 to 4.0	NR	NR	3.8	5.4
	3.2			3.1	4.5	3.9	5.6
	3.4-3.6			3.5	5.0	4.1	5.9
	3.8-4.2			3.8	5.4	4.3	6.3
	4.6-7.0			4.6	6.6	4.9	7.1
B*	4.0	1160 to 1800	2.0 to 4.0	NR	NR	7.1	10
	5.0-5.2			NR	NR	7.3	11
	5.4-5.6			6.0	8.8	7.4	11
	6.0-6.8			6.6	9.6	7.7	11
	7.4-9.4			7.4	11	7.9	12
C*	6.8	870 to 1800	2.0 to 4.0	NR	NR	12	18
	7.5			NR	NR	12	18
	8.0-8.5			NR	NR	13	18
	9.0-10.5			12	17	13	19
	11.0-16.0			13	20	13	19
D*	13.0	690 to 1200	2.0 to 4.0	20	29	-	-
	13.5-15.5			22	33	-	-
	16.0-22.0			25	37	-	-
E*	21.6	435 to 900	2.0 to 4.0	33	48	-	-
	24.0			33	48	-	-

* For Classical banded belts multiply the force in the table by the number of belts in the band.

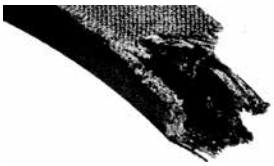
Narrow V-Belt Tensioning Table

Belt	Small Sheave Dia. Range (inches)	Small Sheave RPM Range	Speed Ratio Range	Belt Deflection Force in Lbs.			
				Narrow		Narrow Cogged	
				Min.	Max.	Min.	Max.
3V*	2.20	1200-3600	2.00 to 4.00	NR	NR	2.8	4.1
	2.35-2.50	1200-3600		NR	NR	3.2	4.7
	2.65-2.80	1200-3600		3.2	4.7	3.5	5.1
	3.00-3.15	1200-3600		3.6	5.3	3.8	5.5
	3.35-3.65	1200-3600		4.1	5.9	4.1	6.0
	4.12-5.00	900-3600		4.7	6.8	4.8	7.1
	5.30-6.90	900-3600		5.2	7.6	5.8	8.6
5V*	4.40-4.65	1200-3600	2.00 to 4.00	NR	NR	9.0	13
	4.90-5.50	1200-3600		NR	NR	10	15
	5.90-6.70	1200-3600		NR	NR	11	17
	7.10-8.00	600-1800		11	17	13	19
	8.50-10.90	600-1800		13	19	14	20
	11.80-16.00	400-1200		15	22	15	23
8V*	12.50-17.00	600-1200	2.00 to 4.00	31	45	-	-
	18.00-24.00	400-900		36	53	-	-

NR - Not Recommended
* For Narrow banded belts, multiply the force in the table by the number of belts in the band.

The deflection forces in these tables apply only to the listed belts currently being manufactured.

How to Diagnose V-Belt Failure



Snub Break

Cause
Cover wear indicates slip. Clean break reveals sudden snap.
Prevention
Maintain proper tension on the drive.

Distorted Belt

Cause
Breakdown of adhesion or broken cords.
Prevention
Do not pry belts on drives. Check sheaves for recommended diameters.

Abrasion

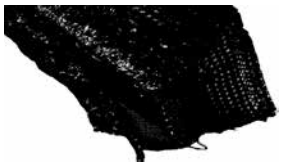
Cause
Foreign material and rust in sheaves wore away sidewalls, letting belt drop to bottom of groove.
Prevention
Dust guards help protect against abrasion. Tension must be maintained in dusty atmospheres.

Oil Deterioration

Cause
Oil-softened rubber.
Prevention
Splash guards will protect drives against oil. Although Classical belts are oil resisting, excessive oil can cause some deterioration.

Cover Fabric Rupture

Cause
Cover fabric ruptured when belt was pried over sheave during installation.
Prevention
Proper installation of belts by moving motor so belts do not have to be pried into the grooves.

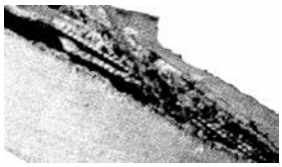


Slip Burn

Cause
Belt too loose. Belt didn't move, friction against sheave burned rubber. When belt finally grabbed, it snapped
Prevention
Maintain proper tension on the drive.

Base Cracking

Cause
Sever back-bend idlers. Improper storage. Excessive ambient operating temperature.
Prevention
Check storage conditions. If back-bend idler cannot be avoided, install idler for larger diameter. Avoid ambient temperature over 140°.

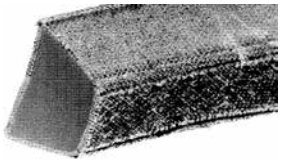


Ply Separation

Cause
Split along pitch line indicating belt ran over too small a sheave.
Prevention
Redesign drive using sheaves of proper size.

Ruptured

Cause
Ruptured cords in the plies.
Prevention
Check for rocks or tools falling into sheave grooves. Check tension. Belts loose enough to twist in groove can rupture cords.



Worn Belt Sides

Cause
Misalignment. Grit or dirt. Normal wear.
Prevention
Align sheaves. Replace belts as required.

V-Belt	Belt Section	Minimum Sheave Pitch Diameter
Classical	A	3”
	B	5.4”
	C	9”
	D	13”
	E	21”
Classical Cogged	AX	2.2”
	BX	4”
	CX	6.8”
Narrow	3V	2.6”
	5V	7.1”
	8V	12.5”
Narrow Cogged	3VX	2.2”
	5VX	4.4”

Safety should be your number one concern.
* Always turn equipment OFF before installing a belt.
* Every v-belt should have a proper belt guard.
* Before installation, check safe speed limits for sheaves.
* Before installation, lock out the disconnect switch, control valve or the like.
* Wear gloves when inspecting sheaves to prevent injury from burrs.