POWERSPORT BELT FAILURE ANALYSIS
IDENTIFY AND TROUBLESHOOT CVT DRIVE ISSUES

1. TENSILE CORD BREAK
   - Complete belt break through the tensile cord
   - Potentially caused by:
     - Belt subjected to shock-loading from sudden excessive engagement RPM, repeated aggressive hard acceleration and braking (especially with heavy weight on vehicle)
     - Back-bending, crimping, or prying on belt during installation compromised tensile cord integrity and irreversibly damaged belt
     - Improper gear ratio, clutch center-to-center distance too long, or jammed/locked drive train

2. CHUNK-OUT
   - Sheared cogs, compression section (undercord) fractured/torn (chunk-out)
   - Potentially caused by:
     - Improper belt installation; belt was back-bent, crimped, or prying on during installation
     - Belt worn past its service limits from high mileage, evidenced by cracks between cogs and eventual cog shearing
     - Belt hit or rubbed against a stationary object

3. EDGE CORD PULLOUT
   - Tensile cord is frayed or separating/unraveling from belt body
   - Potentially caused by:
     - Clutch misalignment or incorrect belt-pulley angle prevented the belt from riding fully on the sidewalls; resulting extreme friction, heat, and belt material loss led to cord exposure
     - Improper or insufficient belt break-in

4. CRACKS BETWEEN COGS
   - Potentially caused by:
     - Belt not moving while drive clutch was spinning at full speed; this generated extreme heat and burned the belt
     - Vehicle idled in gear for extended period of time; high belt engagement RPM settings
     - Drive system was locked or jammed, possibly due to improper gear ratio selection
     - Opening the throttle to get a vehicle unstuck
     - Belt-to-sheave clearance was incorrect or, on snowmobiles, belt deflection was set improperly

5. HOUR-GALASSING, UNEVEN BELT WEAR, SPIN BURNS
   - Potentially caused by:
     - Belt was not moving while drive clutch was spinning at full speed; this generated extreme heat and burned the belt
     - Vehicle idled in gear for extended period of time; high belt engagement RPM settings
     - Drive system was locked or jammed, possibly due to improper gear ratio selection
     - Opening the throttle to get a vehicle unstuck
     - Belt-to-sheave clearance was incorrect or, on snowmobiles, belt deflection was set improperly

6. BELT DISINTEGRATION
   - Potentially caused by:
     - Belt was not moving while drive clutch was spinning at full speed; this generated extreme heat and burned the belt
     - Vehicle idled in gear for extended period of time; high belt engagement RPM settings
     - Drive system was locked or jammed, possibly due to improper gear ratio selection
     - Opening the throttle to get a vehicle unstuck
     - Belt-to-sheave clearance was incorrect or, on snowmobiles, belt deflection was set improperly

7. GLAZING
   - Potentially caused by:
     - Intense heat from repeated and excessive belt slippage due to:
       - Improperly tuned clutches for any vehicle modifications beyond stock (added weight, tire size, style) or terrain (sand, rock, caving, mud)
       - Insufficient pressure on belt sides due to worn or stuck rollers, worn helix or clutch bushings
       - Excessive horsepower for belt; inappropriate torque loads beyond stated capability of stock vehicle
       - Improper gear ratio for the application (use of high gear range while towing, climbing steep hills, or riding in deep snow/mud)
       - Excessive operation in low gear for extended periods of time
       - Dirty clutches, oil, dirt, or belt residue

SYMPTOM | POTENTIAL CAUSES | RECOMMENDATIONS
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1. TENSILE CORD BREAK: | - Belt subjected to shock-loading from sudden excessive engagement RPM, repeated aggressive hard acceleration and braking (especially with heavy weight on vehicle)
- Back-bending, crimping, or prying on belt during installation compromised tensile cord integrity and irreversibly damaged belt
- Improper gear ratio, clutch center-to-center distance too long, or jammed/locked drive train | - Drive using smooth acceleration taking into account vehicle load; avoid repetitive hard braking and immediate acceleration
- Follow proper storage and handling procedures (do not back-bend, crimp, or invert the belt)
- Verify the correct belt is being used
- Ensure engagement RPM is appropriate, clutch center-to-center spacing is correct, and proper gear is utilized for terrain
- While in park or neutral all the time, the secondary clutch should be stationary

2. CHUNK-OUT: | - Improper belt installation; belt was back-bent, crimped, or prying on during installation
- Belt worn past its service limits from high mileage, evidenced by cracks between cogs and eventual cog shearing
- Belt hit or rubbed against a stationary object | - Replace belt and perform proper new belt break-in procedure, allowing extra time when performing heat cycles in very cold conditions
- Never back-bend or crimp a CVT belt; never turn a CVT belt inside out; do not pry on belt during installation
- Always check drive components to confirm clear belt travel path

3. EDGE CORD PULLOUT: | - Tensile cord is frayed or separating/unraveling from belt body | - Replace belt; further use will cause belt disintegration
- Inspect primary and secondary clutches for any defects and ensure proper alignment; always prep clutches prior to belt installation
- On snowmobiles, always verify the integrity of the motor mounts and torque stop when replacing a drive belt; adjust clutches to proper offset and center-to-center distance
- Always perform proper new belt break-in procedure after installation

4. CRACKS FORMING IN BETWEEN COGS: | - Belt is worn past its service limit due to considerable use
- New belt was flexed/bent in extremely cold weather, or turned inside out at any time | - Replace belt and perform proper new belt break-in procedure, allowing extra time when performing heat cycles in very cold conditions
- Never back-bend or crimp a CVT belt; never turn a CVT belt inside out

5. HOUR-GALASSING, UNEVEN BELT WEAR, SPIN BURNS: | - Belt is worn unevenly in one section, forming a groove (hour-glassing)
- Belt subjected to shock-loading, excessive belt speed, or excessive operation in low gear (high torque loads beyond what is intended for the stock vehicle)
- Excessive heat build-up caused by extreme drive conditions (stuck in deep sand, gravel, or mud; spinning at full throttle)
- Misaligned or improperly tuned clutches (not tuned to match vehicle modifications)
- Excessive heat conditions led to glazing and hardening, increased slip, and rapid wear
- Back-bending, crimping, or prying on belt during installation compromised tensile cord integrity and irreversibly damaged belt | - Verify the correct belt and gear ratio are being used; confirm proper belt engagement RPM
- Ensure the belt-to-sheave clearance (gaps between belt side wall and sheave on both sides) is within optimal range. On snowmobiles, check and adjust belt deflection to vehicle specifications
- Verify clutches are properly tuned for vehicle modifications, added weight, the size/style, terrain, and riding style

6. BELT DISINTEGRATION: | - Belt has broken apart into many pieces | - Verify correct belt for the application, clutches aligned and properly tuned for any vehicle modifications beyond stock (especially tire size) and added vehicle weight
- Ensure the proper gear ratio is used for the terrain and riding conditions
- Ensure the belt-to-sheave clearance (gaps between belt side wall and sheave on both sides) is within optimal range
- On snowmobiles, always verify the integrity of the motor mounts and torque stop when replacing a drive belt; adjust deflection to vehicle specifications, and ensure correct center-to-center distance
- Inspect primary and secondary clutches for any defects and ensure proper alignment; always prep clutches prior to belt installation and follow proper belt break-in procedures
- Never back-bend or crimp a CVT belt; never turn a CVT belt inside out; do not pry on belt during installation
- In extremely cold conditions, warm the belt to room temperature prior to open-throttle riding

7. GLAZING: | - Belt looks melted and shiny, or has baked appearance due to overheating | - Verify correct belt for the application, clutches aligned and properly tuned for any vehicle modifications beyond stock (especially tire size) and added vehicle weight
- Always perform proper new belt break-in procedure after installation to seat the belt
- Verify clutch sheaves and belt are clean and free of contaminants; examine rollers, helix and bushings for signs of wear and replace if necessary
- Always use in appropriate gear range for terrain and conditions

Belt Failure Analysis PDF

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