

SUBJECT: DSD 412 ELEVATOR DRIVE COMMISSIONING PROCEDURE

1. Inspect & hi-pot or megger motor field & armature wiring & insulation.
(Disconnect from drive before hi-pot/megger)
2. Measure motor field ohms - Compare to expectations.
3. Measure & verify transformer primary & secondary volts.
 - a. Check for balanced Vac from phase - Ground
 - b. Enter/Verify drive Vac parameter (F#9)
4. Enter/Verify drive parameters from motor nameplate, hoistway contract, & shaft encoder.
 - a. Rated Armature Current (F#3).
 - b. Rated Armature Voltage (F#7).
 - c. Encoder Pulses/Rev (F#10).
 - d. Motor RPM (F#11).
5. Enter/Verify motor field parameter data.
 - a. Full Field amps (F#50)
 - b. Weak Field amps (F#49)
 - c. Stand-by amps (F#53)
 - d. Vac of pwr source
6. Disconnect ripple filter capacitors. (Pull fuse)
7. Perform drive Self-Diagnostics F#998. (Must Pass)
8. Perform drive Self Tune F#997 (No caps in ripple filter)
 - a. Perform several times to compare consistency.
 - b. Compare values measured with a sanity check. (An Armature Inductance of 800 mH is obviously wrong!)
 - c. Record and enter Field L/R (F#51) tuning value. (from monitor F#615)
 - d. Record and enter L (F#6) & R (F#4) tuning values. (From monitor F#614 and F#613)
 - e. [See separate section on Ripple filter choke and capacitors]

9. Run drive in low speed inspection mode and;
 - a. Start with default values for System Inertia F#41, Response F#40, & Stability F#42.
 - b. Verify proper direction set up.
 - c. Verify motor field ampere calibration (F#612) w/ separate metering.
 - d. Verify encoder polarity and rpm/fpm calibration.
 - e. Verify motor armature current calibration (F#611) w/ separate metering.
 - f. Verify that motor field current regulator is stable and responsive.
 - g. Verify that Safety Chain / Emergency Stop works.
 - h. Measure & record Vac (Ripple Voltage) on motor armature, observe acoustic ripple noise.
10. Run drive at higher inspection mode speed and;
 - a. Verify motor armature voltage feedback calibration w/ separate metering.
 - b. Verify motor voltage ratio to full speed. (or top of Full Field speed range)
11. Measure system per unit inertia (used for F#41) and set drive parameters.
 - a. Use speed profile without S-Curve smoothing.
 - b. Use balanced car-load & counterweight.
 - c. Start w/ Response (F#40)= 5 radians, Stability (F#42) =2.
 - d. Make trial runs to verify expected acceleration current at contract accel rate.
 - e. Tweak Jpu (F#41) if overshoot or undershoot is apparent.
12. Set up Motor Field Weakening operation (balanced car).
 - a. Use S-Curve speed profile and proper accel/decel rates
 - b. Make long floor-floor runs, to start...
 - c. Adjust Weak Field (F#49) for proper CEMF (F#609) at full speed.
(Max CEMF = nominal Vac)
 - d. Adjust Full→Weak transition point (F#57) and rate (F#59) to be early and fast.
 - e. Adjust Weak→Full transition point (F#58) and rate (F#56) to be late and slow.
 - f. Record motor volts and amps w/ chart recorder at full speed trial runs.
 - g. Adjust Full→Weak transition (F#57) and rate (F#59) for max CEMF (F#609) limiting without overshoot.
 - h. Adjust Weak→Full transition (F#58) and rate (F#56) for CEMF (F#609) extension without overshoot.
13. Remeasure and adjust system per unit inertia (F#41).(Now that field strengths are fixed)
14. Place Full Load in car.
 - a. Verify that accel/decel amps and stopping distances are within expected bounds.

15. Readjust Response (F#40) & Stability (F#42) for best overall performance. (Full, Balanced, Empty)
16. Determine if capacitors need to be added in ripple filter for acoustic noise reduction.
[See separate section/Application Note on ripple filter chokes and capacitors]
 - a. Add proper values of C and Rdamping.
 - b. Perform Self Tune again, record L & R from several trials.
 - c. Enter these new R & L values for drive to use.
 - d. Repeat fast floor runs, long & short. Readjust Response (F#40) & Stability (F#42) if necessary.
17. Use gain reduction at ~20% speed (F#108) to minimize rope resonance if necessary. Check/Adjust individual rope tension if necessary.
18. Adjust Tach/encoder rate feedback (F#107) if necessary.
19. Adjust location vanes (or other means) for perfect landing at each floor.