

# STATIC PRESSURE DIAGNOSTIC AND REPAIR PROCEDURE



## PREPARATION

Take total external static pressure and pressure drop readings on the system as directed by the NCI *Total Static Pressure Procedure* and *Pressure Drop Procedure*. Record and analyze your readings.

## DIAGNOSTIC PROCEDURE

- Compare the positive and negative readings from your total external static pressure tests. One will often be significantly higher than the other. The side of the fan with the highest pressure is typically where to begin your diagnostics.
- Begin testing pressure drops over the system components on the supply or return side of the fan where the pressure is highest. Normally, the coil and the filter are two components placed directly in the air stream that have the highest pressure drops. Ideally the filter pressure drop should be less than 20% of rated TESP and the coil should be less than 40% of rated TESP.
- To reduce filter pressure drop, the filter can be cleaned, but most of the time it must be replaced with a less restrictive filter. If higher efficiency filters are essential, add filter racks or return air filter grilles to increase surface area and reduce filter pressure drop.
- To reduce coil pressure drop, the coil may be cleaned. Replacing coils is expensive, but if the fan can't afford the coil, it may have to be replaced with a less restrictive coil.
- Check duct sizing compared to NCI's *Duct Design Tables*. This chart offers duct sizes with corresponding airflows from systems that actually work. Evaluate duct sizes by totaling expected cfm from the airflows listed on the chart. If necessary, replace with larger ducts or install additional ducts to achieve required airflow.
- Adding return ducts will normally relieve system static pressure and should be included in nearly every duct renovation.
- If static pressure is high in the plenums (Over .15" if the fan is rated at .50") this may also be an indication of undersized ducts.
- Transitions with a pressure drop over .10" may indicate the need to replace them. Remote plenums and duct board triangle boxes are two of the most common offenders to good airflow.
- Duct that may be internally damaged or have loose duct liner can be discovered by measuring static pressure down the duct every 5 feet or so. When the static pressure reading jumps or dives, the internal restriction is between the last two test locations.
- Ideally, airflow should discharge straight for 3-4 duct diameters from a fan and have 1.5 to 2 straight duct diameters at the fan inlet. This and other defects can be found through a visual inspection.
- Most airflow problems are caused by a combination of system defects, so always include multiple repairs in your duct renovations.
- Remember most of the duct system can typically be reused.
- Always test out at the end of a duct renovation to verify final airflow.