Let $z = (z_1, \cdots z_n)$ be as before local coordinates around p_i such that

$$\left(\frac{\partial}{\partial z_i}, \frac{\partial}{\partial z_j}\right) = \delta_{ij}$$

in $B_\epsilon(p_\nu)$; write

$$v(z) = \sum v^j(z) \cdot \frac{\partial}{\partial z_j}.$$

Then since our metric is Euclidean in $B_\epsilon(p_\nu)$, the connection D is zero and

$$E_{jk} = +\left(\frac{\partial v^j}{\partial z_k} + \sum_i \Gamma^j_{ki} v^i\right) = +\frac{\partial v^j}{\partial z_k},$$

i.e $$P(E)(p_\nu) = -P(A_{p_\nu}).$$

⌈ Since D is zero, $\theta_{ij} = 0 \Rightarrow \Gamma^j_{ik} = 0 . \Rightarrow$

$$E_{jk} = \frac{\partial v^j}{\partial z_k}$$

$$P(E)(p_\nu) = \tilde{P}(\underbrace{-E, -E, \cdots -E}_{n})$$

$$= \tilde{P}\left(-\frac{\partial v^j}{\partial z_k}, -\frac{\partial v^j}{\partial z_k}, \cdots -\frac{\partial v^j}{\partial z_k}\right)$$

$$= P\left(-\frac{\partial v^j}{\partial z_k}\right) = (-1)^n P(A_{p_\nu})$$

"
$$v(z) = \sum \left(\frac{\partial v^j}{\partial z_k} z_k + [\partial]\right) \frac{\partial}{\partial z_j}$$

$$= \sum \frac{\partial v^j}{\partial z_k} z_k \frac{\partial}{\partial z_j} + [\partial]$$

$$\Rightarrow A_{p_\nu} = \left(\frac{\partial v^j}{\partial z_k}\right)_{p_\nu}$$ "

⌋