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$$\Rightarrow \iota(x)=\Lambda=\left\langle\begin{array}{l|c|c}
 & \scriptstyle i-1 & \scriptstyle i \\
(\ *,\ 1,\ \cdots & 0 & * \\
(\ *,\ 0.\ 1,\ \cdots & 0 & * \\
\ \vdots & & \vdots \\
i\text{-}2\,(\ 0,\ 0\ \cdots\ 0, & 1 & * \\
i\text{-}1\,(\ 0\ \ 0\ \cdots\ 0 & 0 & 0 \\
(\qquad O & 0 & \\
 & \vdots & \\
 & 0 &
\end{array}\qquad * \right\rangle$$

$$\Rightarrow \dim(\Lambda\cap V_{n-i+3}) \geq K-l+1 = K-(i-2)+1 = K-i+3.$$

Point: Either that $\sigma_1, \cdots \sigma_{i-2}$ are linearly independent or that if $\forall$ $\sigma_1, \cdots \hat{\sigma}_m \cdots \sigma_{i-1}$ or $\sigma_1, \cdots \hat{\sigma}_m \cdots, \sigma_i$ are linearly independent and σ_m can't be a member of linearly independent vectors, then $\sigma_m = *\sigma_1 + \cdots + 0\,\sigma_{i-1}$ or $\sigma_m = *\sigma_1 + \cdots + 0\,\sigma_i$.

In the exactly same way, we can see that

$$\dim(\Lambda\cap V_{n-K+K-i+x}) \geq K-i+x, \quad x\geq 2.$$

Now it remains to show that $\iota^{-1}(\sigma_{j\cdots j}) \subset D_i^{(j)}$.
Suppose there is an element $x\in \iota^{-1}(\sigma_{j\cdots j}) - D_i^{(j)}$.
Let $\iota(x)=\Lambda$. Since $x\notin D_i^{(j)}$, $l=\dim \overline{\sigma_1(x),\cdots\sigma_i(x)} > i-j$.

$$\iota(x)=\Lambda=\left\langle\left(\begin{array}{l|cccccccccccccccc}
 & & & & & & & & & & & & i & i+1 & \cdots & i+j & n \\
 & * & *\cdots & 1 & *\cdots & 0 & *\cdots & \cdots * & 0 & *\cdots & & & * & *\cdots & & * & * \\
 & * & * & 0 & *\cdots & 1 & *\cdots & \cdots * & 0 & * & & & * & *\cdots & & * & * \\
 & * & * & 0 & *\cdots & 0 & *\cdots & \cdots * & 0 & * & & & * & * & & * & * \\
 & \vdots & \vdots & \vdots & & \vdots & \vdots & \vdots & \vdots & & & & \vdots & & & \vdots & \vdots \\
l & * & *\cdots & 0 & *\cdots & 0 & *\cdots & \cdots * & 1 & *\cdots & & & * & * & & * & * \\
l+1 & 0 & 0\cdots & 0 & 0\cdots & 0 & 0 & \cdots & 0 & 0 & 0\cdots & & 0 & * & & * & * \\
\uparrow & 0 & 0\cdots & 0 & 0\cdots & 0 & 0\cdots & & 0 & 0 & 0\cdots & & 0 & * & & * & * \\
K\text{-}l & \vdots & \vdots & \vdots & & \vdots & \vdots & & \vdots & \vdots & \vdots & & \vdots & & & \vdots & \vdots \\
\downarrow & 0 & 0\cdots & 0 & \cdots & 0 & 0\cdots & & 0 & 0 & 0\cdots & & 0 & *\cdots & & * & *
\end{array}\right)\right\rangle \cdots (*)$$