multiplying by a constant and adding a constant we can write the series expansion of F as

$$F(z) = \frac{1}{z^2} + [1].$$

┌ From $\mathrm{Res}_p(F\omega) = 0$, if $F = \frac{a_{-2}}{z^2} + \frac{a_{-1}}{z} + a_0 + a_1 z + \cdots$, then $a_{-1} = 0$ since ω is everywhere nonzero, and $\omega = dz$.
$\Rightarrow (F - a_0)\frac{1}{a_{-2}} = F'$.
$\Rightarrow F' = \frac{1}{z^2} + [1]$, where $[1]$ means that $[1]$ is a function which can be divided by z. i.e $[1] = z\,g(z)$, $g(z)$ is holomorphic. ┘

"95. 2. 23. If $\omega = h(z)dz$, $h(0) \neq 0$, we can find a coordinate η, s.t $\omega = d\eta$. i.e $\int h(z)dz = \eta(z)$.

Now consider the meromorphic function dF/ω on S.

┌ Since ω is a nonvanishing section of $T^{*\prime}S$ and $\dim S = 1$, which implies rank $T^{*\prime}S = 1$,
$T^{*\prime}S$ is a trivial bundle. $\Rightarrow \omega = (\omega_\alpha)$, where $\omega_\alpha = \omega_\beta$ on $U_\alpha \cap U_\beta$. $\Rightarrow$ Since $dF = (dF_\alpha)$ where $dF_\alpha = dF_\beta$. $F_\alpha = F|U_\alpha$, dF/ω defines an meromorphic function on S. ┘

Since ω is nonzero everywhere, dF/ω is holomorphic on $S - \{p\}$ and has a triple pole at p; setting

$$F' = \lambda \frac{dF}{\omega} + \lambda' F + \lambda''$$

for suitable constants $\lambda, \lambda', \lambda''$, we can write

$$F'(z) = \frac{1}{z^3} + [1]$$

near p.