$$\mathfrak{W}(m) = \log\left(1 - \Lambda(a_t)/\bar{\Lambda}(a_t)\right) \tag{1}$$
$$\mathfrak{W}'(m) = \left(\frac{\bar{\Lambda}'(a_t)\Lambda(a_t)/\bar{\Lambda}(m)^2 - \Lambda'(a_t)/\bar{\Lambda}(a_t)}{(1 - \Lambda(a_t)/\bar{\Lambda}(a_t))}\right) \tag{2}$$

but $\lim_{a_t \downarrow \underline{a_t}}\{\bar{\Lambda}, \bar{\Lambda}'\}$ are finite numbers, while $\lim_{a_t \downarrow \underline{a_t}} \Lambda = 0$ and $\lim_{a_t \downarrow \underline{a_t}} \Lambda'$ is finite, so

$$\lim_{a_t \downarrow \underline{a_t}} \mathfrak{W}'(a_t) = -\Lambda'(a_t)/\bar{\Lambda}(a_t) \tag{3}$$
$$\lim_{a_t \downarrow \underline{a_t}} \mathfrak{W}''(a_t) = \bar{\Lambda}'(a_t)\Lambda'(a_t)/\bar{\Lambda}(a_t)^2 - \Lambda''(a_t)/\bar{\Lambda}(a_t) \tag{4}$$