$$\partial 2I\_5/\partial f2 = 2 \begin{bmatrix} (A_{1,1})I_3 & (A_{1,2})I_3 & (A_{1,3})I_3 \\ (A_{2,1})I_3 & (A_{2,2})I_3 & (A_{2,3})I_3 \\ (A_{3,1})I_3 & (A_{3,2})I_3 & (A_{3,3})I_3 \end{bmatrix}$$

where

- $A \in \mathbb{R}^{3 \times 3}$