15. We first consider the 1200 kg part. The impulse has magnitude J and is (by our choice of coordinates) in the positive direction. Let m_1 be the mass of the part and v_1 be its velocity after the bolts are exploded. We assume both parts are at rest before the explosion. Then $J = m_1 v_1$, so

$$v_1 = \frac{J}{m_1} = \frac{300\,\text{N}\cdot\text{s}}{1200\,\text{kg}} = 0.25\ \text{m/s}\ .$$

The impulse on the 1800 kg part has the same magnitude but is in the opposite direction, so $-J = m_2 v_2$, where m_2 is the mass and v_2 is the velocity of the part. Therefore,

$$v_2 = -\frac{J}{m_2} = -\frac{300\,\text{N}\cdot\text{s}}{1800\,\text{kg}} = -0.167\ \text{m/s}\ .$$

Consequently, the relative speed of the parts after the explosion is $0.25\,\text{m/s} - (-0.167\,\text{m/s}) = 0.417\,\text{m/s}$.