

| Level   | Requirements              | 2016 (36.3 fb <sup>-1</sup> ) |             | 2018 (54.5 fb <sup>-1</sup> ) |             |
|---------|---------------------------|-------------------------------|-------------|-------------------------------|-------------|
|         |                           | Tight                         | Loose       | Tight                         | Loose       |
| HLT     | $p_T$ thresholds          | 92, 76, 64, 15 GeV            |             | 105, 88, 76, 15 GeV           |             |
|         | Number of b tags          | $\geq 1$                      | $\geq 2$    | $\geq 1$                      | $\geq 2$    |
|         | $\Delta\phi_{b\bar{b}}$   | $< 1.6$                       | $< 2.1$     | $< 1.9$                       | $< 2.8$     |
|         | $\Delta\eta_{jj}$         | $> 4.1$                       | $> 2.3$     | $> 3.5$                       | $> 1.5$     |
|         | $m_{jj}$                  | $> 500$ GeV                   | $> 240$ GeV | $> 460$ GeV                   | $> 200$ GeV |
| Offline | $p_T$ thresholds          | 95, 80, 65, 30 GeV            |             | 110, 90, 80, 30 GeV           |             |
|         | Jet $ \eta  < 4.7$        | ✓                             | ✓           | ✓                             | ✓           |
|         | Lepton veto               | ✓                             | ✓           | ✓                             | ✓           |
|         | Number of b tags $\geq 2$ | ✓                             | ✓           | ✓                             | ✓           |
|         | b jet $ \eta  < 2.4$      | ✓                             | ✓           | ✓                             | ✓           |
|         | $\Delta\phi_{b\bar{b}}$   | $< 1.6$                       | $< 2.1$     | $< 1.6$                       | $< 2.1$     |
|         | $\Delta\eta_{jj}$         | $> 4.2$                       | $> 2.5$     | $> 3.8$                       | $> 2.5$     |
|         | $m_{jj}$                  | $> 500$ GeV                   | $> 250$ GeV | $> 500$ GeV                   | $> 250$ GeV |