$$\sqrt{2}\,\sqrt{-\frac{L_{*\#}}{r_{*\#}\,(4+L_{*\#})}}\,\sqrt{\xi} + \frac{\left(-36 - 4\,L_{*\#} + L_{*\#}^2\right)\xi^{3/2}}{6\sqrt{2}\,\sqrt{-L_{*\#}}\,\left(r_{*\#}\,(4+L_{*\#})\right)^{3/2}} + \frac{L_{*\#}^2\left(144 - 3744\,L_{*\#} - 1624\,L_{*\#}^2 - 136\,L_{*\#}^3 + 9\,L_{*\#}^4\right)\xi^{5/2}}{240\sqrt{2}\,r_{*\#}^2\,(4+L_{*\#})^2\,\sqrt{-r_{*\#}\,L_{*\#}^7\,(4+L_{*\#})}} -$$

$$\frac{\left(L_{*\#}\left(12480 + 19776\,L_{*\#} - 8592\,L_{*\#}^2 - 10784\,L_{*\#}^3 - 2732\,L_{*\#}^4 - 188\,L_{*\#}^5 + 5\,L_{*\#}^6\right)\right)\xi^{7/2}}{448\left(\sqrt{2}\,r_{*\#}^3\,(4+L_{*\#})^3\,\sqrt{-r_{*\#}\,L_{*\#}^7\,(4+L_{*\#})}\right)} +$$

$$\left(\left(11439360 + 42347520\,L_{*\#} + 56183040\,L_{*\#}^2 + 17521920\,L_{*\#}^3 - 4943392\,L_{*\#}^4 - 3744704\,L_{*\#}^5 - \right.\right.$$
$$\left.\left. 709936\,L_{*\#}^6 - 41808\,L_{*\#}^7 + 525\,L_{*\#}^8\right)\xi^{9/2}\right) \Big/ \left(138240\sqrt{2}\,r_{*\#}^4\,(4+L_{*\#})^4\,\sqrt{-r_{*\#}\,L_{*\#}^7\,(4+L_{*\#})}\right) +$$

$$\left(\left(-60318720 + 192384000\,L_{*\#} + 1011406080\,L_{*\#}^2 + 1529840640\,L_{*\#}^3 + 866594688\,L_{*\#}^4 + \right.\right.$$
$$\left.\left. 157458048\,L_{*\#}^5 - 33015648\,L_{*\#}^6 - 18666944\,L_{*\#}^7 - 2875220\,L_{*\#}^8 - 147924\,L_{*\#}^9 + 945\,L_{*\#}^{10}\right)\xi^{11/2}\right) \Big/$$
$$\left(675840\sqrt{2}\,r_{*\#}^5\,(-L_{*\#})^{9/2}\,(4+L_{*\#})^5\,\sqrt{r_{*\#}\,(4+L_{*\#})}\right) +$$

$$\left(\left(-632293724160 - 2155286568960\,L_{*\#} - 2395199600640\,L_{*\#}^2 + 236777748480\,L_{*\#}^3 + \right.\right.$$
$$3081436694784\,L_{*\#}^4 + 2733581233152\,L_{*\#}^5 + 1014268345088\,L_{*\#}^6 + 127225805568\,L_{*\#}^7 -$$
$$\left.\left. 25746179952\,L_{*\#}^8 - 11039030176\,L_{*\#}^9 - 1426991544\,L_{*\#}^{10} - 64846440\,L_{*\#}^{11} + 218295\,L_{*\#}^{12}\right)\xi^{13/2}\right) \Big/$$
$$\left(402554880\sqrt{2}\,r_{*\#}^6\,L_{*\#}^2\,(4+L_{*\#})^6\,\sqrt{-r_{*\#}\,L_{*\#}^7\,(4+L_{*\#})}\right) + O[\xi]^{15/2}$$