CLAIMS:

1. A method for producing a diesel fraction and a lubricant base oil, comprising:

contacting a feedstock having a T5 boiling point of at least about 650°F (343°C) and a sulfur content of about 2000 wppm or less with a hydrocracking catalyst under effective hydrocracking conditions for lubricant base oil production to produce a hydrocracked effluent, the effective hydrocracking conditions comprising a temperature of about 288°C to about 449°C, a hydrogen partial pressure of about 250 psig to about 5000 psig, a liquid hourly space velocity of about 0.05 h^{-1} to about 10 h^{-1}, and a hydrogen treat gas rate of about 200 SCF/B to about 10000 SCF/B;

dewaxing the hydrocracked effluent under effective catalytic dewaxing conditions in the presence of a dewaxing catalyst, the effective catalytic dewaxing conditions comprising a temperature of about 550°F to about 840°F, a hydrogen partial pressure of about 250 psig to about 5000 psig, a liquid hourly space velocity of about 0.2 h^{-1} to about 10 h^{-1}, and a hydrogen treat gas rate of about 200 SCF/B to about 10000 SCF/B;

hydrofinishing the hydrocracked, dewaxed effluent under effective hydrofinshing conditions in the presence of a hydrofinishing catalyst, the hydrofinishing catalyst comprising at least one metal on a support, the at least one metal consisting essentially of a Group VIII metal, the effective hydrofinishing conditions comprising a temperature of about 125°C to about 425°C, a hydrogen partial pressure of about 500 psig to about 3000 psig, and a liquid hourly space velocity of about 0.1 h^{-1} to about 5 h^{-1}, the conversion of the feedstock during the contacting the feedstock with the hydrocracking catalyst, the dewaxing of the hydrocracked effluent, and the hydrofinishing the hydrocracked, dewaxed effluent being about 45% or less relative to a conversion temperature of 700°F; and

fractionating the hydrofinished effluent to produce at least a naphtha product fraction, a first diesel fraction, a second diesel fraction having a higher cut point temperature than a cut point temperature for the first diesel fraction, and a lubricant base oil fraction, the lubricant base oil fraction comprising at least about 50 wt% of the hydrofinished effluent, the first diesel fraction having a pour point of

about -40°C or less, a cetane number of at least about 55, and a sulfur content of less than about 1 wppm~~,~~.

wherein a density at a first temperature of the first diesel fraction is less than a density at the first temperature of the hydrofinished effluent, the second diesel fraction having a density at the first temperature that is greater than the density at the first temperature of the hydrofinished effluent.

~~2. The method of claim 1, wherein a density at a first temperature of the first diesel fraction is less than a density at the first temperature of the hydrofinished effluent.~~

~~3.~~2. The method of claim ~~2~~ 1, wherein the first diesel fraction comprises at least about 20 wt% of the hydrofinished effluent.

~~4.~~3. The method of claim ~~3~~ 2, wherein the second diesel fraction comprises at least about 20 wt% of a weight of the first diesel fraction, a density of the second diesel fraction at the first temperature being greater than the density at the first temperature of the hydrofinished effluent.

~~5.~~4. The method of claim 1, wherein a temperature at which 99.5 wt% of the first diesel fraction boils (T99.5 boiling point) is about 400°C or less.

~~6.~~5. The method of claim 1, wherein the contacting of the feedstock under effective hydrocracking conditions converts 45% or less of the molecules boiling at 700°F (371°C) or more in the feedstock to molecules boiling at less than 700°F (371°C).

~~7.~~6. The method of claim 1, further comprising hydrotreating the feedstock prior to contacting the feedstock with the hydrocracking catalyst.

~~8.~~7. The method of claim ~~7~~ 6, wherein hydrotreating the feedstock and contacting of the feedstock under the effective hydrocracking conditions, in

combination, converts 45% or less of the molecules boiling at 700°F (371°C) or more in the feedstock to molecules boiling at less than 700°F (371°C).

~~9.~~8. The method of claim 1, wherein the first diesel fraction has a cloud point of about -25°C or less and has an aromatics content of less than about 1.0 wt%.

~~10.~~9. The method of claim 1, wherein the lubricant base oil fraction comprises at least about 60 wt% of the hydrofinished effluent.

~~11.~~10. The method of claim 1, wherein the first diesel fraction comprises at least about 50 wt% of fuels fractions formed during said fractionating.

~~12.~~11. A method for producing a diesel fraction and a lubricant base oil, comprising:

contacting a feedstock having a T5 boiling point of at least about 650°F (343°C) with a hydrocracking catalyst under effective hydrocracking conditions for lubricant base oil production to produce a hydrocracked effluent, the effective hydrocracking conditions comprising a temperature of about 288°C to about 449°C, a hydrogen partial pressure of about 250 psig to about 5000 psig, a liquid hourly space velocity of about 0.05 h^{-1} to about 10 h^{-1}, and a hydrogen treat gas rate of about 200 SCF/B to about 10000 SCF/B;

dewaxing the hydrocracked effluent under effective catalytic dewaxing conditions in the presence of a dewaxing catalyst, the effective catalytic dewaxing conditions comprising a temperature of about 550°F to about 840°F, a hydrogen partial pressure of about 250 psig to about 5000 psig, a liquid hourly space velocity of about 0.2 h^{-1} to about 10 h^{-1}, and a hydrogen treat gas rate of about 200 SCF/B to about 10000 SCF/B;

hydrofinishing the hydrocracked, dewaxed effluent under effective hydrofinshing conditions in the presence of a hydrofinishing catalyst, the effective hydrofinishing conditions comprising a temperature of about 125°C to about 425°C, a hydrogen partial pressure of about 500 psig to about 3000 psig, and a liquid hourly space velocity of about 0.1 h^{-1} to about 5 h^{-1}; and

fractionating the hydrocracked, dewaxed effluent to produce at least a naphtha product fraction, a first diesel fraction having a cetane number of at least 55, a second diesel fraction having a higher cut point temperature than a cut point temperature for the first diesel fraction, and a lubricant base oil fraction, the lubricant base oil fraction comprising at least about 50 wt% of the hydrocracked, dewaxed effluent, the first diesel fraction comprising at least about 20 wt% of the hydrocracked, dewaxed effluent, the second diesel fraction having a weight that is at least about 20% of a weight of the first diesel fraction,

wherein the first diesel fraction has a density at a first temperature that is less than a density at the first temperature for the hydrocracked dewaxed effluent, the second diesel fraction having a density at the first temperature that is greater than the density at the first temperature for the hydrocracked dewaxed effluent.

~~13.~~12. The method of claim ~~12~~ 11, wherein the hydrocracked, dewaxed effluent is fractionated prior to the hydrofinishing.

~~14.~~13. The method of claim ~~12~~ 11, wherein the lubricant base oil fraction comprises at least about 60 wt% of the hydrocracked, dewaxed effluent and the first diesel fraction comprises at least about 50 wt% of fuels fractions formed during said fractionating.

~~15.~~14. The method of claim ~~12~~ 11, wherein the first diesel fraction has a cetane number of at least about 55.

~~16.~~15. A method for producing a diesel fraction and a lubricant base oil, comprising:

contacting a feedstock having a T5 boiling point of at least about 700°F (343°C) and a sulfur content of about 100 wppm to about 2000 wppm with a hydrocracking catalyst under effective hydrocracking conditions to produce a liquid hydrocracked effluent, the effective hydrocracking conditions being effective for reducing the sulfur content of the liquid hydrocracked effluent to about 1 wppm or less, the 700+°F conversion of the feedstock being about 30% or less, the effective hydrocracking conditions comprising a temperature of about 288°C to about 449°C, a

hydrogen partial pressure of about 250 psig to about 5000 psig, a liquid hourly space velocity of about 0.05 h^{-1} to about 10 h^{-1}, and a hydrogen treat gas rate of about 200 SCF/B to about 10000 SCF/B;

fractionating liquid hydrocracked effluent to form a first fraction and a lubricant boiling range fraction, the lubricant boiling range fraction comprising at least 50 wt% of the liquid hydrocracked effluent;

dewaxing the first fraction under first effective catalytic dewaxing conditions in the presence of a dewaxing catalyst, the effective catalytic dewaxing conditions comprising a temperature of about 550°F to about 840°F, a hydrogen partial pressure of about 250 psig to about 5000 psig, a liquid hourly space velocity of about 0.2 h^{-1} to about 10 h^{-1}, and a hydrogen treat gas rate of about 200 SCF/B to about 10000 SCF/B; and

fractionating the hydrocracked, dewaxed first fraction to produce at least a naphtha product fraction, a first diesel fraction having a T99.5 boiling point of about 393°C or less, and a second diesel fraction having a higher T99.5 temperature than the first diesel fraction, a weight of the second diesel fraction being at least about 20% of a weight of the first diesel fraction, the first diesel fraction having a pour point of about -40°C or less, a cetane number of at least about 55, and a sulfur content of less than about 1 wppm.

~~17.~~16. The method of claim ~~16~~ 15, further comprising

dewaxing the lubricant boiling range fraction under second effective catalytic dewaxing conditions in the presence of a dewaxing catalyst; and

hydrofinishing the dewaxed lubricant boiling range fraction under second effective hydrofinshing conditions in the presence of a hydrofinishing catalyst to form a lubricant base oil.

~~18.~~17. The method of claim ~~17~~ 16, wherein the second effective catalytic dewaxing conditions are the same as the first catalytic dewaxing conditions.

~~19.~~18. The method of claim 16, wherein the lubricant base oil fraction comprises at least about 60 wt% of the liquid hydrocracked~~, dewaxed~~ effluent and the

first diesel fraction comprises at least about 50 wt% of fuels fractions formed during said fractionating.

~~20.~~19. The method of claim ~~16~~ 15, wherein the first diesel fraction comprises at least about 20 wt% of the hydrocracked, dewaxed ~~effluent~~ first fraction.

20. The method of claim 1, wherein the hydrofinishing catalyst consists of one or more Group VIII noble metals on a support.