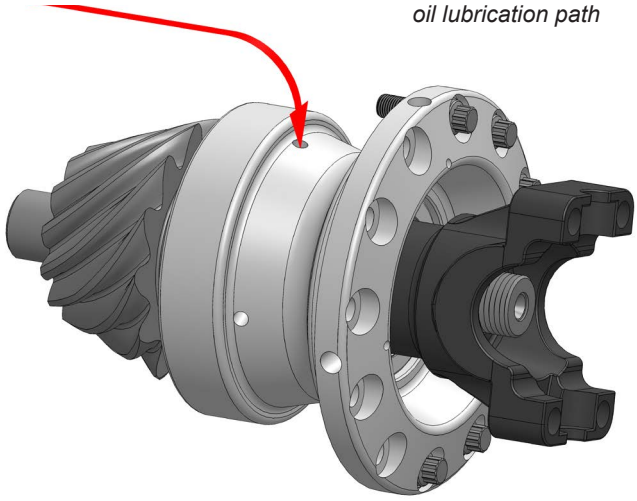
Kit Summary:

Kit #	P3250LT, P3250ST, P3812LT, P3812ST & P3812LTC
Description	Ultra Case Packages
Applications	Ford 9" Housing
Page	1 of 4 total pages
Date Modified	Jun 29, 2015

RaceStrange

- **Endures abusive Pro-mod, Alcohol & heavy door car applications**
- **Long pinion support for improved pinion shaft support**
- **Larger pinion bearings for increased ring & pinion life**
- **Accept 9", 9.50", & 10" gear sets**
- **Oil porting to maximize bearing life**
- **Premium grade aluminium**

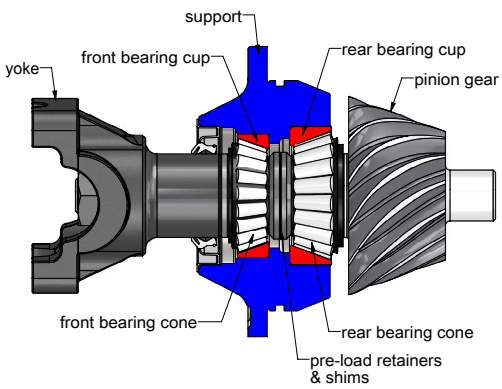


Ultra case packages with taper/taper bearings		
Part #	***Case bore***	***Pinion Spline***
P3250LT	3.250"	35
P3250ST	3.250"	28
P3812LT	3.812"	35
P3812ST	3.812"	28
P3812LTC	3.812"	35

Ultra case packages with taper/ball bearings		
Part #	***Case bore***	***Pinion Spline***
P3812LB	3.812"	35
P3812SB	3.812"	28

These instructions only overview the installation and assembly of the pinion support.
Center section set-up specification for backlash and side bearing preload are not provided.

Pinion Bearing Preload



Bearing preload is the measure of torque [in-lbs] required to rotate the pinion after the nut has been torqued to spec.

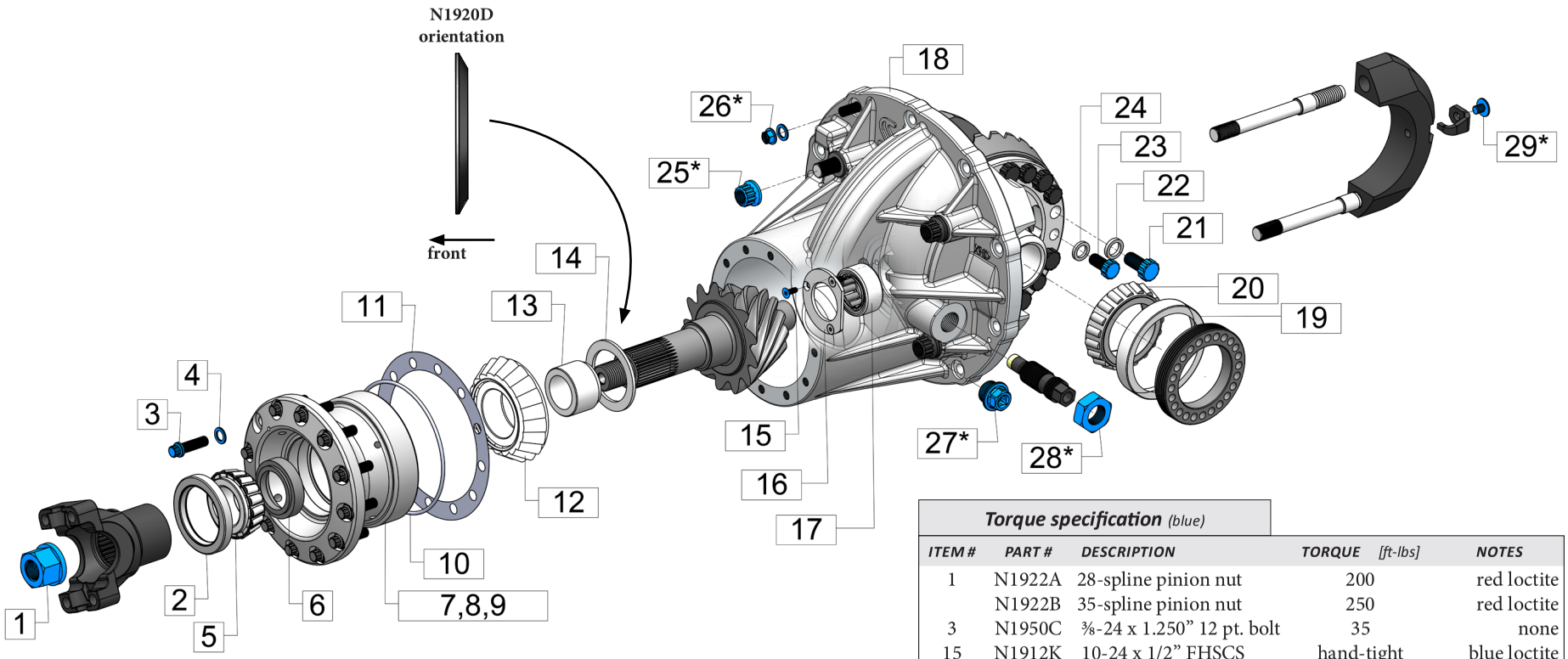
Preload using a solid shim:
One solid steel piece that is oversized in width must be surface ground to the required thickness for proper preload. Usually, the shim pack method is first used to determine the final thickness of the solid shim. Further grinding the shim increases preload.

⚠ pinion nuts are installed with red loctite
only apply loctite after preload has been established

Application	***Preload*** [in-lbs] *(without seal)*
ball bearing	9-12
taper bearing	20-25

Pinion Nut Torque

28- spline pinion: 200 ft-lbs
35- spline pinion: 250 ft-lbs



The above illustration depicts a general assembly of all kits.
Some parts may be omitted for particular kits.
Refer to kit components on the following page for exact component descriptions and part numbers.

Angular contact ball bearing orientation

Torque specification (blue)

ITEM #	PART #	DESCRIPTION	TORQUE [ft-lbs]	NOTES
1	N1922A	28-spline pinion nut	200	red loctite
	N1922B	35-spline pinion nut	250	red loctite
3	N1950C	⅜-24 x 1.250" 12 pt. bolt	35	none
15	N1912K	10-24 x 1/2" FHSCS	hand-tight	blue loctite
21	N1965A	7/16-20 x ⅞" HHCS	65	red loctite
	N1975A	7/16-20 x 1" ARP HHCS	70	red loctite
	L6000Q	7/16-20 x ⅞" ARP 12 pt.	65	red loctite
23	N1964A	½-20 x ⅞" HHCS	85	red loctite
	N1976A	½-20 x 1" HHCS	85	red loctite
	L6000R	½-20 x ⅞" ARP 12 pt.	85	red loctite
25*	L7010AB	9/16-18 12 pt. nut	80	anti-seize
26*	F1282	⅜-24 nut	35	none
27*	N1912U	⅞-14 plug	40	none
28*	N1910	load bolt assembly	--	note 1
29*	N1905B	5/16-18 x ⅜ BHSCS	10	none

notes:

1: Load bolt setup & adjustment. Tighten load bolt while turning assembly by hand until a drag is felt. Loosen load bolt aprox. 0.001" from contacting the ring gear. Rotate assembly again. If drag is felt loosen load bolt an additional 0.001". If no drag is felt, hold load bolt in place and tighten jam nut. Load bolt may need readjustment depending on frequency of runs.

2: items marked "*" are not included

Pinion support components

ITEM#	28 SPLINE PART#		35 SPLINE PART#	QTY	DESCRIPTION
1	N1922A		N1922B		pinion nut
2a	N1960		N1961	1	pinion seal *(taper bearing kits only)*
2b	N1960L		N1961L	1	low drag pinion seal *(ball bearing kits)*
3		N1950C		12	⅜-24 x 1.250" 12 pt. bolt
4		S3402N		12	⅜ washer
5	N1930		N1936	1	bearing cone
6a		N1924A		1	solid bearing preload spacer *(taper bearing kits only)*
6b	N1920F		N1921A	1	solid bearing preload spacer *(ball bearing kits only)*
7a		N1950A		1	pinion support for taper/taper arrangement *(taper bearing kit)*
7b		N1952A		1	pinion support for taper/ball arrangement *(ball bearing kit)*
8		N1931		1	front bearing cup *(pre-installed)*
9		N2001E		1	rear bearing cup *(pre-installed, taper bearing kits only)*
10		N1950B		1	pinion support o-ring
11a		N1950D		1	0.003" depth shim
11b		N1950E		1	0.007" depth shim
11c		N1950F		1	0.008" depth shim
11d		N1950G		1	0.010" depth shim
12a		N2001F		1	tapered roller bearing
12b	N1920B		N1920BM	1	angular contact ball bearing
13a	N1926A		n/a	1	bearing sleeve *(taper bearing kit only)*
13b	N1920G		n/a	1	bearing sleeve *(ball bearing kit only)*
14a	N1926D		n/a	1	bearing spacer *(taper bearing kit only)*
14b	n/a		N1920D	1	bearing spacer *(ball bearing kit only)*
15		N1912K		1	10-24 x ½" FHSCS
16		N1912J		1	tail bearing retainer plate
17		N1943		1	tail bearing

solid preload spacer (6) can be substituted by shim pack (7,8,9)

Ultra case 3.250 bore components

ITEM #	PART #	QTY	DESCRIPTION
18a	N1902	1	3.250" bore HD aluminium case
19a	N1949	2	side bearing cup
20a	N1948	2	side bearing cone
21a	N1965A	10	7/16-20 x ⅞" HHCS
23a	N1964A	10	½-20 x ⅞" HHCS *(35-spline kits only)*

Ultra case 4.000 bore components

ITEM #	PART #	QTY	DESCRIPTION
18c	N1913	1	4.000" bore HD aluminium case
19c	L6000T	2	side bearing cup
20c	L6000S	2	side bearing cone
21c	L6000Q	10	7/16-20 x ⅞" 12 pt.
23c	L6000R	10	½-20 x ⅞" 12 pt.

10" Gear set clearance

- Ultra cases after casting date 5-1-15 have been modified to fit 10" gear sets
- The casting date may be different from the machine date
- Casting date can be found on the rear of the case (figure #1)
- Note the revision can be identified (arrow pointing to feature)
- Figure #2 shows the old design prior 10" gear set revision
- Refer to figure #3 to ensure housing clearance

Ultra case 3.812 bore components

ITEM #	PART #	QTY	DESCRIPTION
18b	N1912	1	3.812" bore HD aluminium case
19b	D1592A	2	side bearing cup
20b	D3530	2	side bearing cone
21b	N1975A	10	7/16-20 x 1" ARP HHCS
22	N1975B	10	7/16 x ⅛" washer
23b	N1976A	10	½-20 x 1" HHCS *(35-spline kits only)*
24a	N1976B	10	½ x ⅛" washer *(35-spline kits only)*

Figure #1- casting date location circled

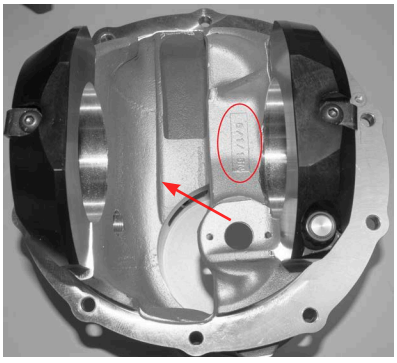


Figure #2- older design without clearance

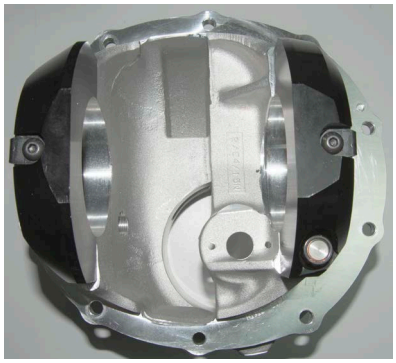
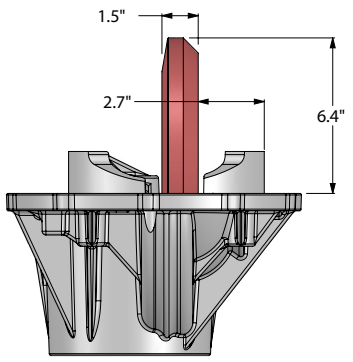


Figure #3- center section housing clearance



Pinion Depth

Pinion depth on 9" rear ends is adjusted by shims between the pinion support and center case. Adding shims moves the pinion gear further away from the center-line of the ring gear.

Taper/taper kit installation:

1. Polish the pinion gear with an emery cloth or sand paper to achieve a slip fit with the front bearing cone (5).
2. For 28 spline kit press the bearing sleeve (13) and slide the bearing spacer (14) over the pinion gear. Then press the rear bearing cone (12) over the pinion gear shaft.
3. Slide the solid bearing preload spacer (6) over the pinion gear shaft.
4. Place the pinion support body (7) onto the pinion shaft.
5. Slide the front bearing cone (5) over the pinion shaft followed by the pinion yoke. Torque the pinion nut. Do not install the seal (2). Refer to the first page for pinion nut torque. Slightly lubricate the pinion gear threads to read the correct torque.
6. Apply a small amount of lightweight gear oil to both bearings and check for bearing drag. This indicates an existent preload condition. Refer to the first page for preload specification and instructions.
7. Once the correct preload has been established, remove the pinion nut and yoke.
8. Press the pinion seal (2) into the pinion support body (7) flush with the outside face of the body. Ensure the front bearing cone is still inside the body before the seal is pressed on.
9. Apply a small coating of lightweight gear oil to the inside diameter of the seal (2).
10. Clean and dry the threads on the pinion gear and reinstall yoke.
11. Clean and dry the threads of the pinion nut before applying red loctite. Install the nut and torque to spec listed on first page.
12. Following the gear manufacture's instructions, install the completed assembly into your Strange Engineering 9" Ford case with the o-ring (10) in the groove machined in the support. The proper amount of depth shims (11) must be determined. Lubricate the o-ring (10) and pinion support bore prior to assembly. Secure with 12 pinion support bolts (3) and torque to 35 ft-lbs for aluminum cases and 45 ft-lbs for iron cases.

Taper/ball kit installation:

1. Polish the pinion gear with an emery cloth or sand paper to achieve a slip fit with the front bearing cone (5).
2. For 35 spline kit slide the bearing spacer (14) over the pinion gear shaft. Ensure correct orientation.
3. For 28 spline kit press the bearing sleeve (13) over the pinion gear shaft.
4. Press the rear angular contact ball bearing (12) into the pinion support body (7). Only press on the outer race until fully seated. Ensure correct orientation of the bearing. Refer to page 2.
5. Press the pinion support body (7) and angular contact ball bearing (12) assembly onto the pinion gear and bearing spacer or sleeve assembly. Only press on the inner race. Do not press on the support body.
6. Slide the solid bearing preload spacer (6) over the pinion gear assembly.
7. Slide the front bearing cone (5) over the pinion shaft followed by the pinion yoke. Torque the pinion nut. Refer to the first page for specification. Do not install the seal (2).
8. Apply a small amount of lightweight gear oil to both bearings and check for bearing drag. This indicates an existent preload condition. Refer to the first page for pinion bearing preload specification and instructions.
9. Once the correct preload has been established, remove the pinion nut and yoke. Press the pinion seal (2) into the pinion support body (7) flush with the outside face of the body.
10. Ensure the front bearing cup (5) is still inside the body before the seal is pressed on.
11. Apply a small coating of lightweight gear oil to the inside diameter of the seal (2).
12. Clean and dry the threads on the pinion gear and reinstall the yoke.
13. Clean and dry the threads of the pinion nut before applying red loctite.
14. Install the pinion nut and torque to spec listed on first page.
15. Following your gear manufacture's instructions, install the completed assembly into your Strange Engineering 9" Ford case with the o-ring (10) in the groove machined in the support. The proper amount of depth shims (11) must be determined. Lubricate the o-ring (10) and pinion support bore prior to assembly. Secure the assembly with 12 pinion support bolts (3) and torque to 35 ft-lbs for aluminium cases and 45 ft-lbs for iron cases.