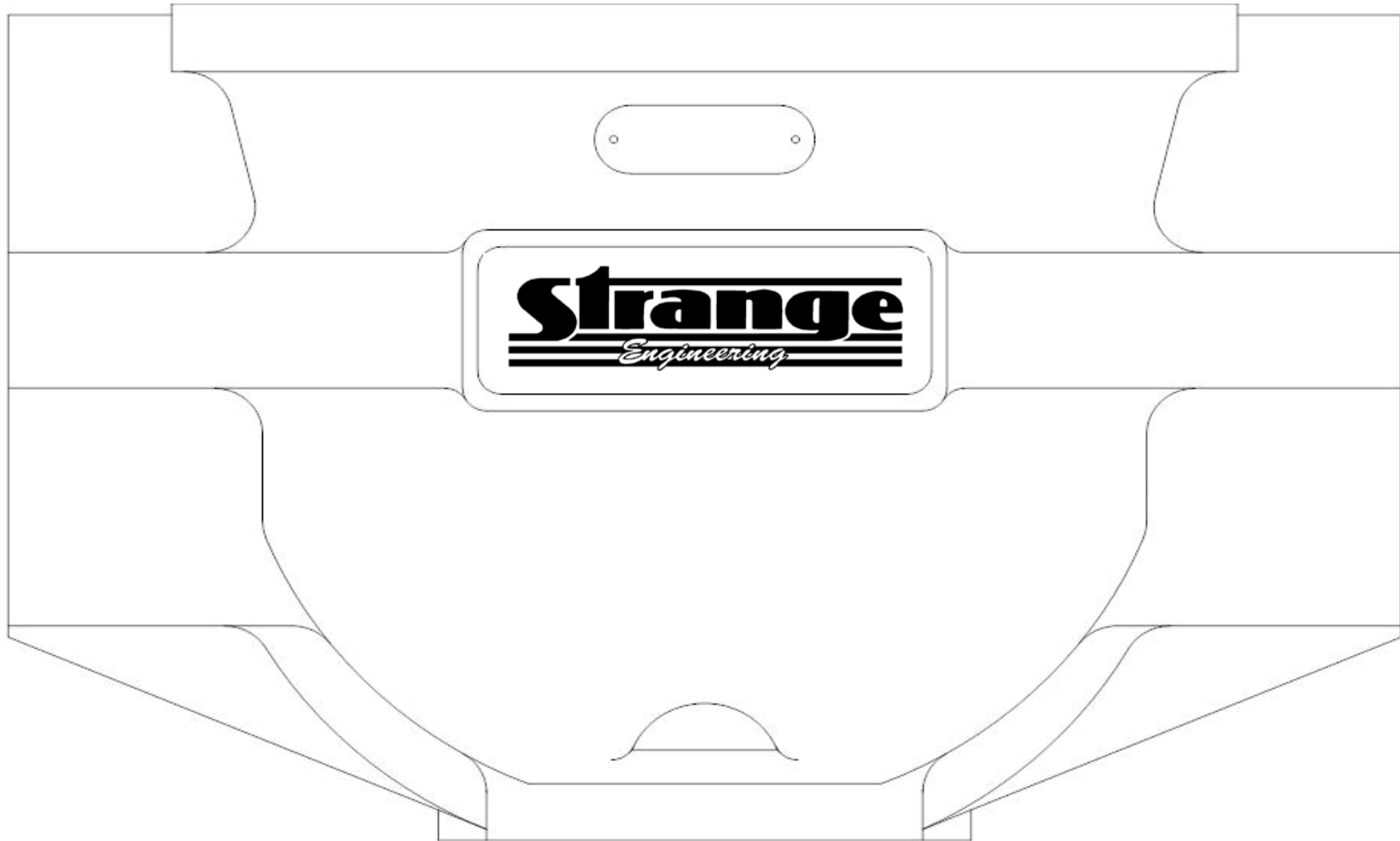


# 9 & 9 ½ Live Axle Instructions



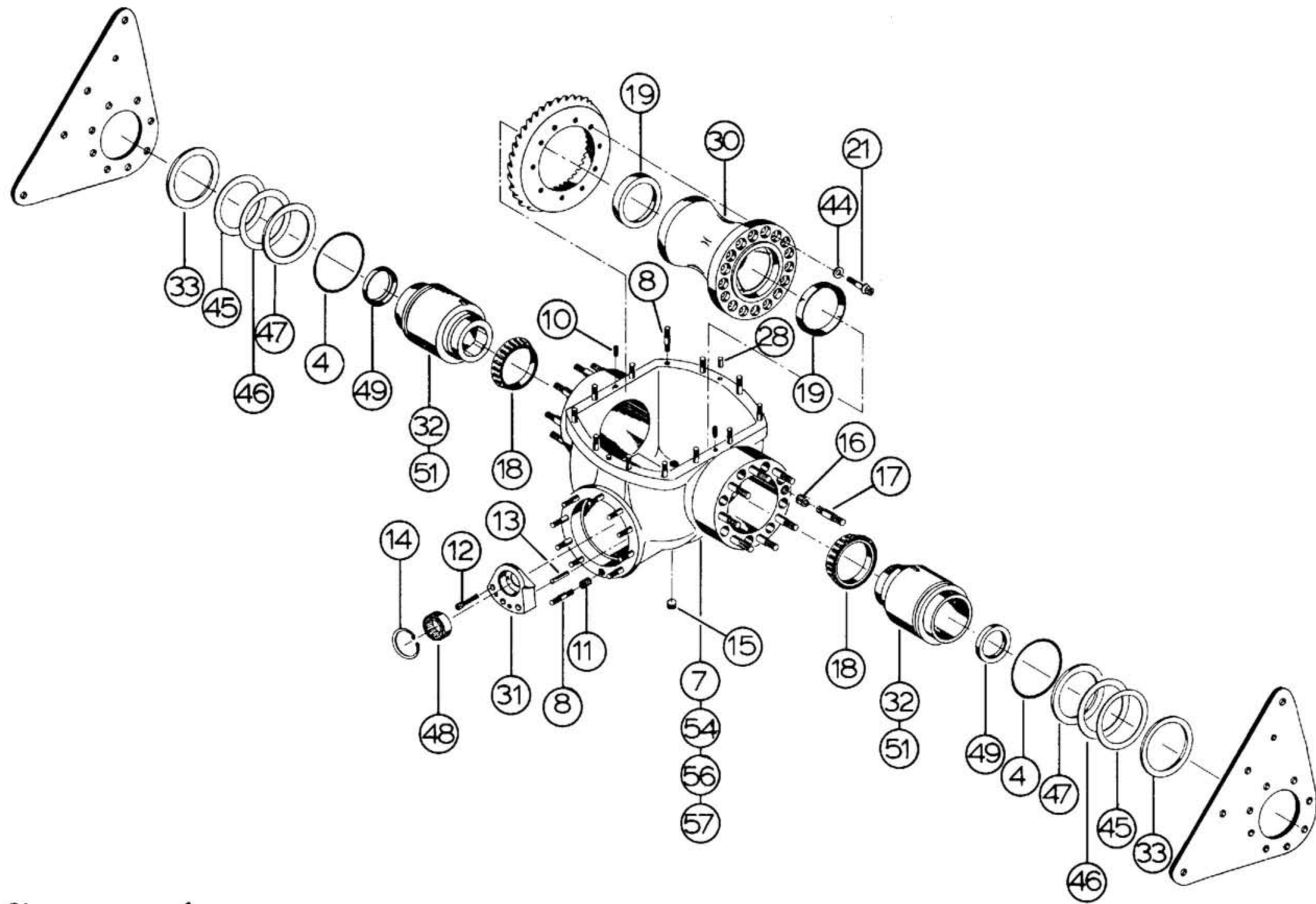


figure 1

figure 2a

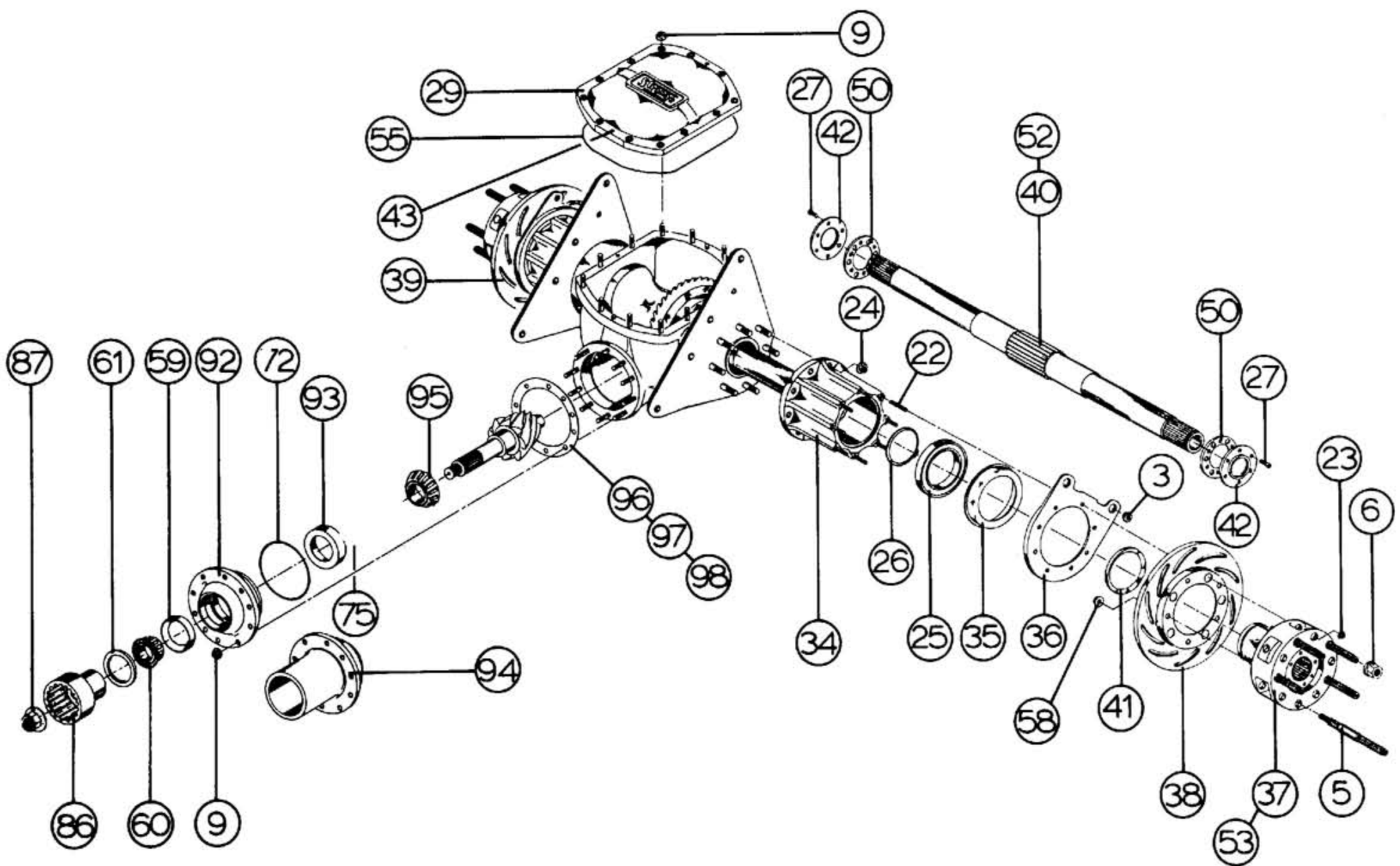
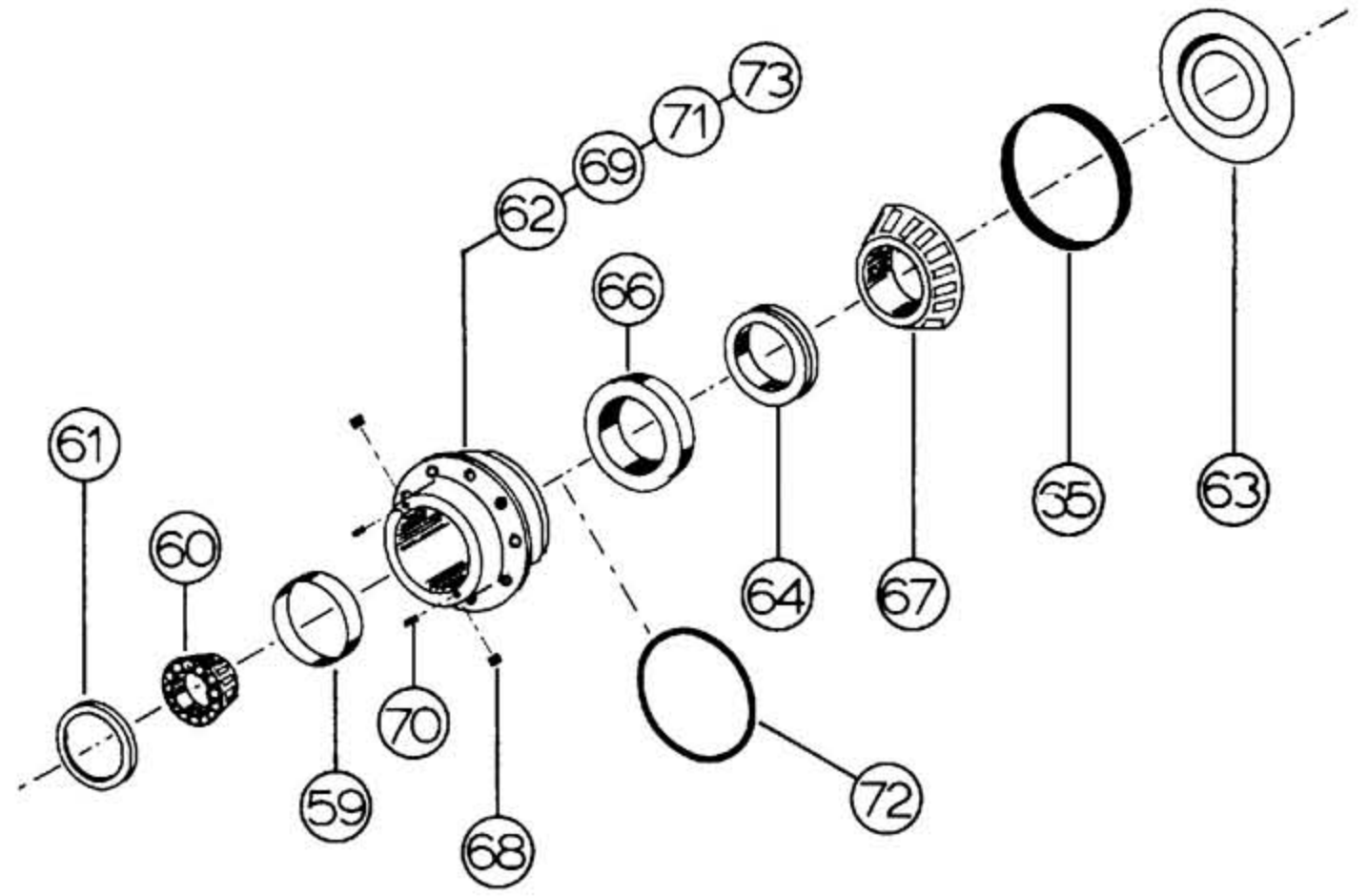


figure 2

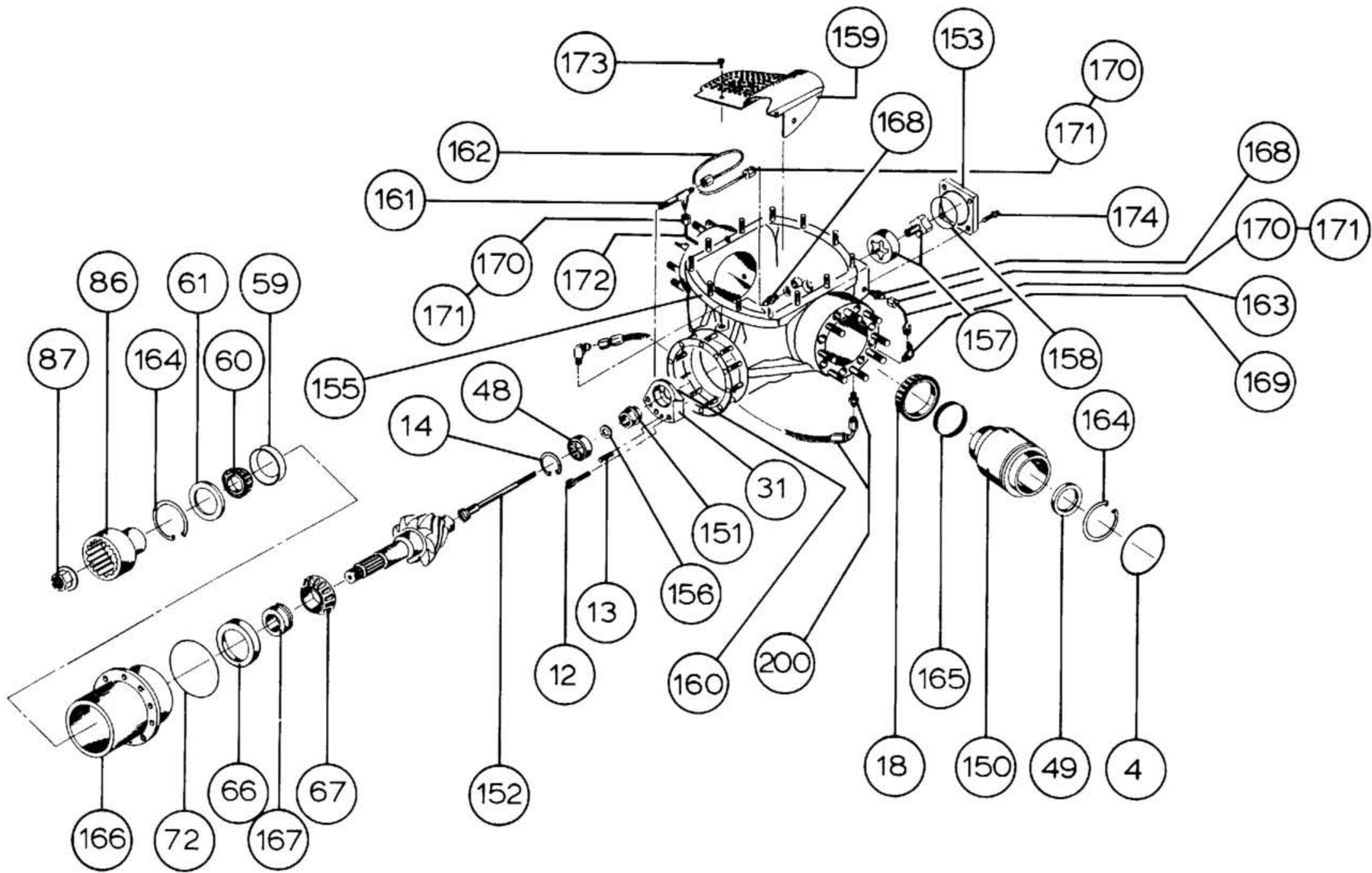


figure 3

COMPLETE ASSEMBLIES

USAGE  
CODE

|       |  |   |
|-------|--|---|
| L4000 | 31" wtw* unit-standard duty (MKI).....             | A |
| L4001 | 32.5" wtw* unit-standard duty (MKI).....           | B |
| L4002 | 33" wtw* unit-standard duty (MKI).....             | C |
| L4003 | 34.5" wtw* unit-standard duty (MKI).....           | D |
| L4100 | 31" wtw* unit-heavy duty (MKII).....               | E |
| L4101 | 32.5" wtw* unit-heavy duty (MKII).....             | F |
| L4102 | 33" wtw* unit-heavy duty (MKII).....               | G |
| L4103 | 34.5" wtw* unit-heavy duty (MKII).....             | H |
| L4500 | 31" wtw* unit-heavy duty w/internal oil pump....   | I |
| L4501 | 32.5" wtw* unit-heavy duty w/internal oil pump.... | J |
| L4502 | 33" wtw* unit-heavy duty w/internal oil pump....   | K |
| L4503 | 34.5" wtw* unit-heavy duty w/internal oil pump.... | L |

PINION SUPPORTS

|       |  |   |
|-------|--|---|
| N1928 | MKI dragster taper/taper pinion support-35spl... | M |
| N1929 | MKI F/C taper/taper pinion support-35spl.....    | N |
| N2001 | MKI dragster sealed pinion support-35-spl.....   | R |
| N2002 | MKI f/c sealed pinion support.....               | S |
| N2003 | MKII dragster sealed pinion support-35-spl.....  | T |
| N2004 | MKII f/c sealed pinion support-35-spl.....       | U |
| N2006 | pump f/c support cvr(35-spl.pin.).....           | V |
| N2007 | pump dragster support(35-spl.pin.).....          | W |
| N2008 | pump f/c support(40-spl.pin.).....               | X |
| N2009 | pump dragster support(40-spl.pin.).....          | Y |
| N2010 | pump f/c support(40-spl.pin.-long).....          | Z |
| N2012 | MKI sealed dragster support(40-spl.).....        |   |
| N2013 | MKII sealed f/c support(40-spl.-long).....       |   |
| N2016 | pump f/c (35-spl.).....                          |   |
| N2022 | MKII sealed dragster support(40-spl.).....       |   |
| N2024 | MKI sealed f/c (40-spl.).....                    |   |
| L4020 | Tool Kit.....                                    |   |
| L4092 | Live axle gear change labor.....                 |   |

\* Wheel-to Wheel width

How to use this illustrated parts and price list;

Item number refers to location on drawing.

Figure refers to drawing number.

Where an item number shows "NS", that item is not shown on a drawing.

Quantity refers to the number of pieces of that item in a complete assembly.

Description is of that item.

Usage code refers to the model unit that part is used on.

All prices are per each, net.

Note; The tool kit is considered separate from the parts list.

The "item" numbers in the tool kit should not be confused with the "item" numbers from the parts list.

| ITEM | FIG. | P/N     | QTY | DESCRIPTION                    | USAGE    |
|------|------|---------|-----|--------------------------------|----------|
| NS   | .    | A1027C  | 10  | 5/8" stud sleeve               | A thru L |
| NS   | .    | A1027G  | 10  | 5/8" aluminum washer           | "        |
| 3    | 2    | B1301E  | 4   | 3/8"-24 press nut              | "        |
| 4    | 1&3  | F1277   | 2   | 241 o-ring                     | "        |
| 5    | 2    | F1278   | 10  | 5/8"-18 wheel stud             | "        |
| 6    | 2    | F1283   | 10  | 5/8"-18 flange nut             | "        |
| 7    | 1    | L4000A  | 1   | 14 3/8" FLA case-lite          | A and B  |
| 8    | 1    | L4000B  | 22  | 3/8"-24 x 1 1/2" stud          | A thru L |
| 9    | 2    | F1282   | 22  | 3/8"-24 lock nut               | "        |
| 10   | 1    | L4000D  | 2   | 5/16"-18 x 3/4" ss-dog pt      | "        |
| 11   | 1    | L4000E  | 10  | 1/2" nf x 3/8" nf insert       | "        |
| 12   | 1    | L4000F  | 3   | 3/8"-16 x 1 1/4" shcs          | "        |
| 13   | 1    | L4000G  | 2   | 3/8" x 1 1/2" dowel pin        | "        |
| 14   | 1    | L4000H  | 1   | retaining ring                 | "        |
| 15   | 1    | L4000J  | 1   | 3/8" npt plug                  | "        |
| 16   | 1    | L4000K  | 16  | 5/8" nf x 1/2" nf insert       | "        |
| 17   | 1    | L4000L  | 16  | 1/2" nf x 2 3/8" stud          | "        |
| 18   | 1    | L4000M  | 2   | L814749 Timken                 | "        |
| 19   | 1    | L4000N  | 2   | L814710 Timken                 | "        |
| 21   | 1    | L4000R  | 10  | 12 point ring gear bolt        | "        |
| 22   | 2    | L4000S  | 16  | 1/4" nc-1/4" nf-2 1/8" stud    | "        |
| 23   | 2    | L4000T  | 16  | 1/4" nf Esna nut               | "        |
| 24   | 2    | L4000U  | 16  | 1/2" nf Esna nut-special       | "        |
| 25   | 2    | L4000V  | 2   | FLA axle bearing               | "        |
| 26   | 2    | L4000W  | 2   | snap ring                      | "        |
| 27   | 2    | L7006GL | 4   | 1/4"-28 x 1" shcs              | "        |
| 28   | 1    | L4000Y  | 2   | 5/16" x 3/4" dowel pin         | "        |
| 29   | 2    | L4000Z  | 1   | FLA case cover                 | "        |
| 30   | 1    | L4001A  | 1   | FLA spool                      | "        |
| 31   | 1&3  | L4001B  | 1   | t-bearing carrier(standard)    | "        |
| 32   | 1    | L4001C  | 2   | 4 3/8" spool brg. sleeve       | ABEFIJ   |
| 33   | 1    | L4001D  | 2   | spool shim .220"               | A thru L |
| 34   | 2    | L4001E  | 2   | housing tube                   | "        |
| 35   | 2    | L4001F  | 2   | axle bearing retainer          | "        |
| 36   | 2    | L4001G  | 2   | caliper mounting bracket       | "        |
| 37   | 2    | L4001H  | 2   | 3 3/8" drive hub               | ACEGIK   |
| 38   | 2    | L4001K  | 1   | FLA rotor-left                 | A thru L |
| 39   | 2    | L4001L  | 1   | FLA rotor-right                | "        |
| 40   | 2    | L4001M  | 1   | axle-32 1/4"                   | ABEFIJ   |
| 41   | 2    | L4001N  | 2   | axle brg. backing ring         | A thru L |
| 42   | 2    | L4001T  | 2   | axle nut                       | "        |
| 43   | 2    | L4001U  | 2   | 3/8"-16 x 3/4" ss-dog pt       | "        |
| 44   | 1    | A1028B  | 10  | FLA ring gear bolt washer      | "        |
| NS   | .    | L4001Z  |     | t-brg. carrier 3.20-3.40 ratio | "        |
| 45   | 1    | L4002J  | 2   | spool shim .003"               | "        |

|    |        |        |      |                            |          |
|----|--------|--------|------|----------------------------|----------|
| 46 | 4      | L4002K | 2    | spool shim .005"           | A thru L |
| 47 | 1      | L4002L |      | spool shim .010"           | "        |
| 48 | 1&3    | N1940  | 1    | tail bearing               | "        |
| 49 | 1&3    | N1961  | 2    | 472015 National seal       | "        |
| 50 | 2      | L4001S | 2    | axle nut spacer ring       | "        |
| 51 | 1      | L4003C | 2    | 5 3/8" spool brg. sleeve   | CDGHKL   |
| 52 | 2      | L4103M | 1    | axle-34 1/4"               | "        |
| 53 | 2      | L4001R | 2    | 4 1/8" drive hub           | BDFHJL   |
| 54 | 1      | L4003A | 1    | 16 3/8" FLA case-lite      | C and D  |
| 55 | 2      | L4002S | 1    | case cover o-ring          | A thru L |
| 56 | 1      | L4100A | 1    | 14 3/8" FLA case-HD        | E and F  |
| 57 | 1      | L4103A | 1    | 16 3/8" FLA case-HD        | G and H  |
| NS | .      | L4001Y | 2    | dual caliper mtg. bracket  | A thru L |
| 58 | 2      | L4002W | 10   | serrated rotor lock nut    | "        |
| 59 | 2,2a&3 | N1931  | 1    | 2729 cup                   | M-P,R-W  |
| 60 | 2,2a&3 | N1936  | 1    | 2788 cone                  | "        |
| 61 | 2,2a&3 | N1961  | 1    | 472015 National seal       | M-P,R-W  |
| 62 | 2a     | N2001A | 1    | MKI short sealed body      | R        |
| 63 | 2a     | N2001B | 1    | seal plate                 | RSTU     |
| 64 | 2a     | N2001C | 1    | 4340 pre-load spacer       | "        |
| 65 | 2a     | N2001D | 1    | rear seal                  | "        |
| 66 | 2a&3   | N2001E | 1    | 55437 rear cup             | R thru Z |
| 67 | 2a&3   | N2001F | 1    | 55187C rear cone           | "        |
| 68 | 2a     | N2001G | 2or4 | 1/8" npt dry seal plug     | RSTU     |
| 69 | 2a     | N2002A | 1    | MKI long sealed body       | "        |
| 70 | 2a     | N2002B | 2    | 1/4" nc x 1/4" set screw   | S and U  |
| 71 | 2a     | N2003A | 1    | MKII short sealed body     | T        |
| 72 | 2,2a&3 | N1958A | 1    | 248 o-ring                 | M-Q,T-Z  |
| 73 | 2a     | N2004A | 1    | MKII long sealed body      | U        |
| 81 | 2      | N1927D | 1    | .004" x 1 1/2" shim        | "        |
| 82 | 2      | N1927E | 1    | .005" x 1 1/2" shim        | "        |
| 83 | 2      | N1927F | 1    | .006" x 1 1/2" shim        | "        |
| 84 | 2      | N1927G | 1    | .007" x 1 1/2" shim        | "        |
| 85 | 2      | N1927H | 1    | .008" x 1 1/2" shim        | "        |
| NS | .      | L4002R | 10   | 1/2" 12 pt ring gear bolt  | A thru L |
| NS | .      | L4002U | 2    | axle end cap               | "        |
| NS | .      | L4002Y | 2    | dummy mount plate (set up) | "        |
| 86 | 2&3    | U3629  | 1    | female coupler             | M thru W |
| 87 | 2&3    | N1922B | 1    | pinion nut                 | M thru Z |

|    |   |        |   |                         |          |
|----|---|--------|---|-------------------------|----------|
| 92 | 2 | N1928A | 1 | taper/taper body-short  | M        |
| 93 | 2 | N1939  | 1 | HM804810 Timken         | MN       |
| 94 | 2 | L4001V | 1 | taper/taper body-long   | N        |
| 95 | 2 | N1938  | 1 | HM804846 Timken         | MN       |
| 96 | 2 | L4002O | 2 | pinion depth shim .007" | A thru L |
| 97 | 2 | L4002P | 2 | pinion depth shim .008" | "        |
| 98 | 2 | L4002Q | 2 | pinion depth shim .010" | "        |

LIVE AXLE ASSEMBLIES WITH INTERNAL OIL PUMP

| Item | Fig. | P/N    | Qty | Description                                   | Usage Code |
|------|------|--------|-----|---|------------|
| 150  | 3    | L4500A | 2   | 4.375" spool brg. sleeve                      | IJ         |
| ...  | .    | L4600A | 2   | 5.375" spool brg. sleeve                      | KL         |
| 151  | 3    | L4500B | 1   | tail bearing bushing                          | I thru L   |
| 152  | 3    | L4500C | 1   | pinion/pump driveshaft                        | "          |
| 153  | 3    | L4500D | 1   | pump cover plate                              | "          |
| 154  | 3    | L4500E | 1   | pumped tail brg. support                      | "          |
| 155  | 3    | L4500X | 1   | 14.375" pumped gear case*                     | IJ         |
| ...  | 3    | L4600X | 1   | 16.375" pumped gear case*                     | KL         |
| 156  | 3    | L4500H | 1   | bushing bearing                               | I thru L   |
| 157  | 3    | L4500I | 1   | oil pump                                      | "          |
| 158  | 3    | L4500J | 1   | pump cover plate o-ring                       | "          |
| 159  | 3    | L4500K | 1   | gear case screen                              | "          |
| 160  | 3    | L4500L | 1   | plug  | "          |
| 161  | 3    | L4500M | 1   | oil fitting                                   | "          |
| 162  | 3    | L4500N | 1   | oil tube                                      | "          |
| 163  | 3    | L4500O | 2   | side oil line                                 | "          |
| 164  | 3    | L4500R | 3   | seal snap ring                                | "          |
| 165  | 3    | L4500S | 2   | sleeve bearing-internal                       | "          |
| 166  | 3    | N2006A | 1   | pres. sprt body w/cover<br>(35 spline pinion) | V          |
| 167  | 3    | N2006B | 1   | pre-load spacer                               | VW         |
| 168  | 3    | P2316  | 3   | #3 an fitting                                 | I thru L   |
| 169  | 3    | P2323  | 2   | #3 an fitting (45 deg)                        | "          |
| 170  | 3    | P2318  | 7   | #3 an coupling nut                            | "          |
| 171  | 3    | P2319  | 7   | #3 an coupling nut sleeve                     | "          |
| 172  | 3    | L4500T | 1   | ring gear oiler tube                          | "          |
| 173  | 3    | L4500U | 2   | gear case screen screw                        | "          |
| 174  | 6    | B1737B | 4   | pump cover bolt                               | "          |

\* Pumped gear cases are sold less the pump and related components.



| Item | Fig | Qty    | Description  | Usage Code |
|------|-----|--------|--|------------|
| NS   | 3   | N2010A | 1 pres. sprt body w/cover<br>(40 spline pinion-long) | Z          |
| NS   | .   | N2010B | 1 front pinion cup(25520)                            | XYZ        |
| NS   | .   | N2010C | 1 front pinion cone(25580)                           | XYZ        |
| NS   | .   | N2010D | 1 pinion seal (C/R 22574)                            | XYZ        |
| NS   | .   | N2010E | 1 snap ring (N5000-350)                              | XYZ        |
| NS   | .   | U3660  | 1 40 spline female coupler                           | XYZ        |

## STRANGE ENGINEERING L4020 LIVE AXLE TOOL KIT

The Strange Engineering live axle tool kit has been designed as an "on site" tool kit. This means that rather than being used for production assembly usage, it is intended for rebuilding units in the field, when circumstances would not permit the unit to be serviced by Strange Engineering or its authorized dealers.

When possible, it is recommended that the unit be serviced by Strange Engineering or its authorized dealers.

The tool kit aids in performing five major tasks, both for assembly and disassembly.

- (1) Setting the backlash.
- (2) Drawing the unit together for final assembly.
- (3) Adjusting the axle location and removing the drive hubs.
- (4) Setting and removing the axle nuts.
- (5) Removing the axle bearings.

In addition to the tools in this kit, also needed will be a pair of large snap ring pliers, depth micrometer, and standard mechanics hand tools.

### TOOL KIT CONTENTS

| Item | Fig   | Qty | P/N    | Description                     |
|------|-------|-----|--------|---------------------------------|
| 1    | 5     | 1   | L4020A | drawbar.....                    |
| 2    | 5,6   | 2   | L4020B | breaker bar.....                |
| 3    | 7     | 1   | L4020C | axle nut spanner.....           |
| 4    | 5,6   | 5   | L4020D | push plate spacer.....          |
| 5    | 8     | 5   | L4020E | bearing removal rod.....        |
| 6    | 6     | 1   | L4020F | jackscrew.....                  |
| 7    | 5,6,8 | 1   | L4020G | push/pull plate.....            |
| 8    | 4     | 2   | L4020H | brg. sleeve adjuster crossbar.. |
| 9    | 4     | 4   | L4020I | brg. sleeve adjuster side bolt. |
| 10   | 4     | 4   | L4020J | snap ring #5100-75.....         |
| 11   | 4     | 2   | L4020K | brg. sleeve adjuster push plate |
| 12   | 4     | 2   | L4020L | brg. sleeve adjuster jackscrew. |
| 13   | 4     | 2   | L4020M | snap ring #5100-37.....         |
| 14   | 6     | 1   | L4020N | jackscrew "bullnose".....       |
| 15   | 6     | 1   | L4020O | bullnose bearing retainer.....  |
| 16   | 6     | 1   | L4020P | Torrington #NTC-1427.....       |
| 17   | 6     | 1   | L4020Q | Torrington #TRC-1427.....       |
| 18   | 5     | 1   | N1922B | drawbar nut.....                |
| 19   | 5     | 1   | A1030D | 3/8"-16 x 2" hhcs-grd 8.....    |
| 20   | 5     | 1   | L4020R | 3/8"-16 hex nut.....            |
| 21   | 7     | 3   | L4020S | 1/4" x 1 1/4" dowel pin.....    |

Figure four. Setting the backlash.

Since the Strange Engineering live axle assembly does not utilize a spanner type adjustment (as a standard nine inch would), the backlash must be obtained by using the bearing sleeve adjusters and shims. The adjusters are used as a pair. Note: Items eight thru thirteen are assembled as a complete unit.

With the spool, ring gear, spool bearing sleeves, and bearings set in place, mount one adjuster assembly on each side of the live axle case. This is done by threading the adjuster side bolts [9] on two studs, 180 degrees apart. Turn the adjuster jackscrews [12] clockwise to contact the spool bearing sleeves and to obtain the initial bearing pre-load. After the pinion depth has been set, the proper amount of backlash is obtained by means of the adjuster jackscrews. The amount of shim required is measured from the adjuster plate to the spool bearing sleeve shim surface and to the case surface using a depth micrometer. Add .005" shim to each side for pre-load.

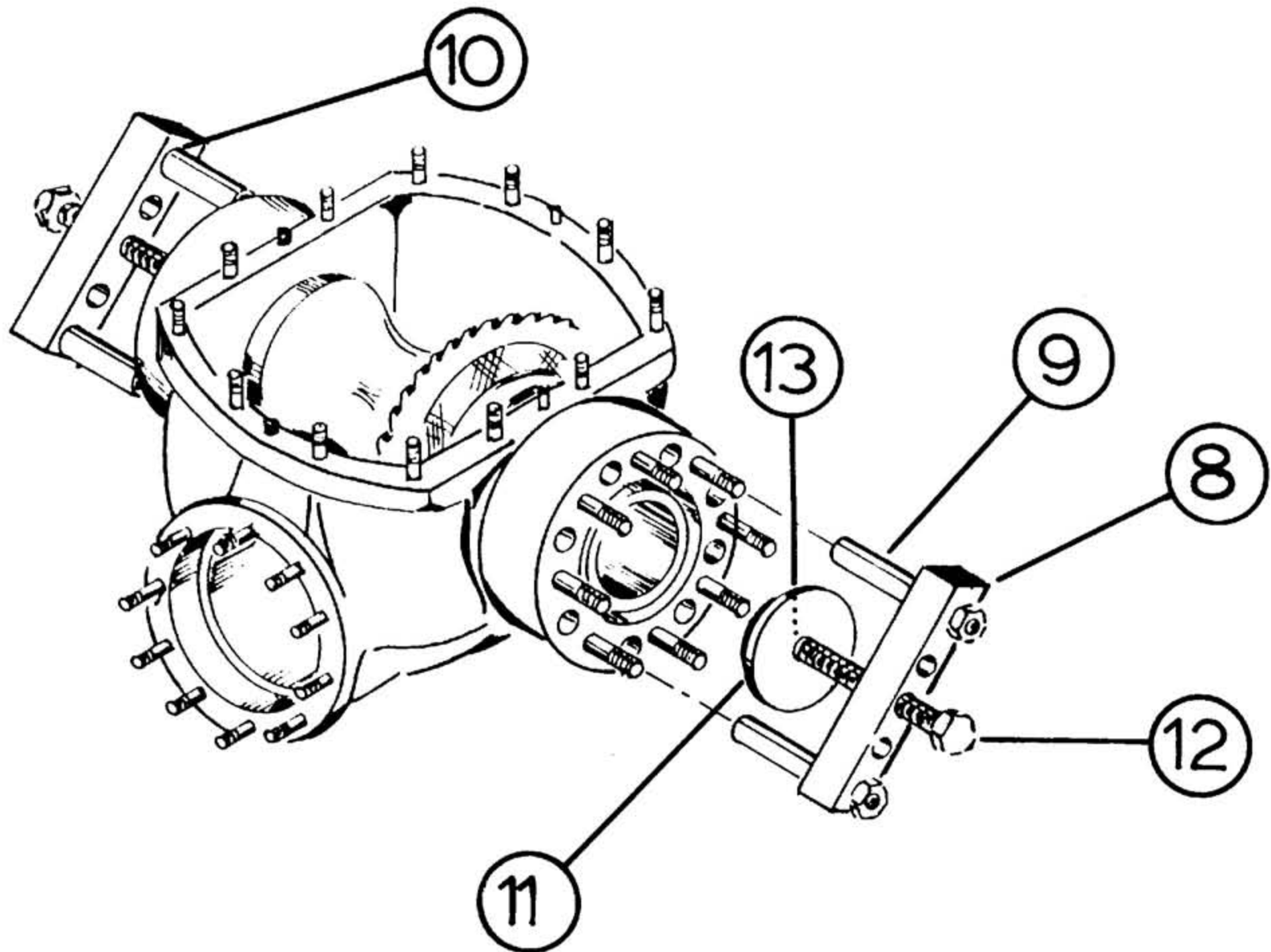


Figure five. Drawing the unit together for final assembly.

Once the gear has been properly set up, the chassis mounting brackets set on, and the axle inserted, the hub and tube assemblies must be installed and the entire assembly drawn together. This is accomplished by means of the drawbar and jackscrew assembly as indicated in the figure below.

(1) Coat the threads on the jackscrew [6] with an anti-sieze compound and thread all the way into the push/pull plate [7].

(2) Slide the jackscrew and push/pull plate, threaded end first, onto the un-threaded end of the drawbar [1] and secure with a bolt [19] and nut [20].

(3) Set the five push plate spacers [4] around the wheel studs.

(4) Slide the threaded end of the drawbar assembly thru the axle tube from the hub side that you are going to draw in, with the push plate over the studs flush to the spacers.

(5) Thread the drawbar nut [18] onto the threaded end of the drawbar protruding from the end of the axle snug to the axle end.

(6) Slip the breaker bars [2] into the holes in the push/pull plate and the jackscrew. Hold the breaker bar in the push/pull plate while turning the jackscrew/drawbar counter-clockwise. Back off the jackscrew and tighten the nut [18] as needed to complete the assembly procedure.

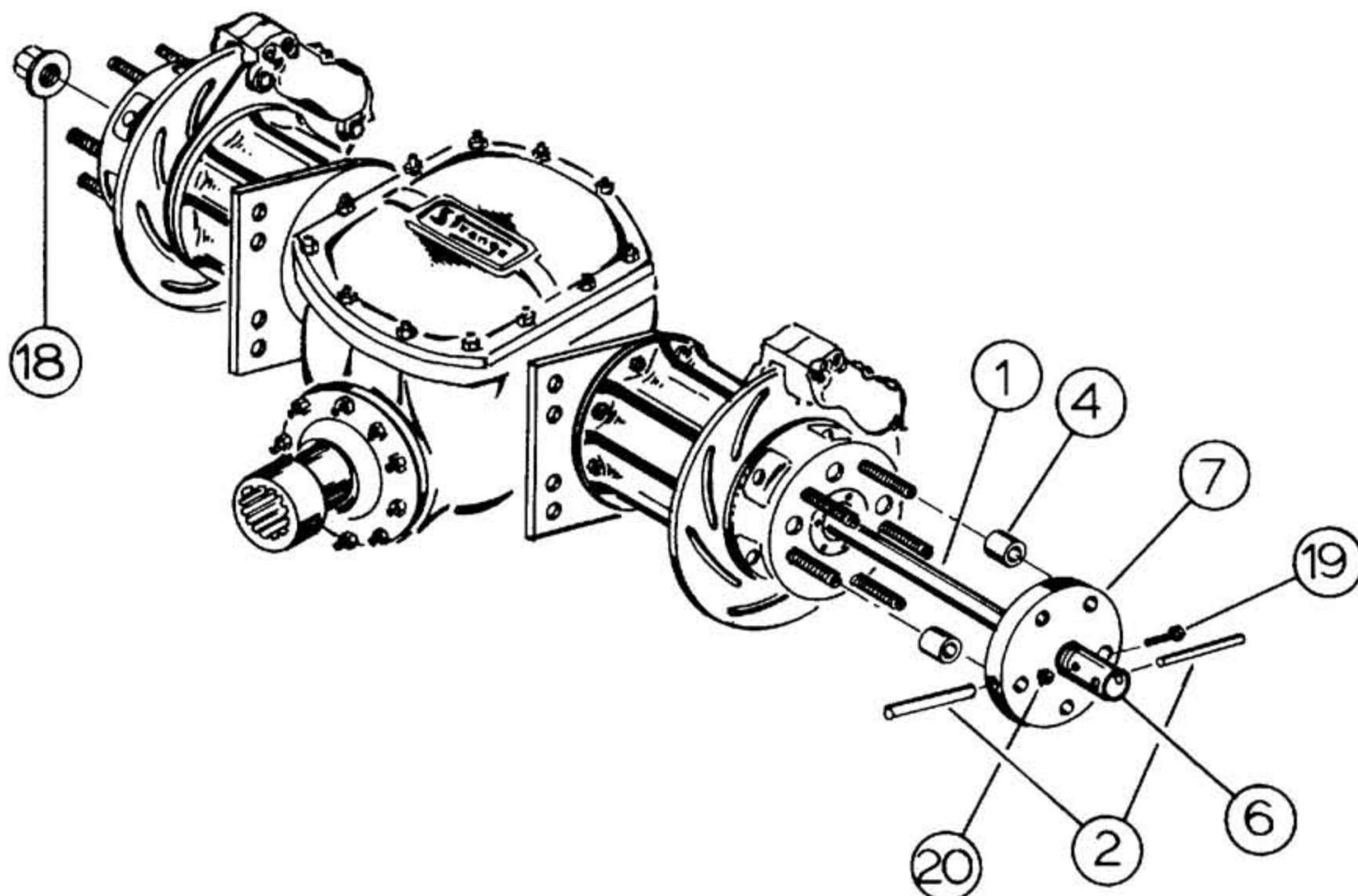


Figure six. Adjusting the axle location, removing the drive hubs.

In order for the axle nuts to be set, the axle location must be properly adjusted. Also, to change a gear set or service the rotors, the axle and/or the drive hub/tubes must be removed. These procedures are easily accomplished by using the push/pull plate and jackscrew as indicated in figure six.

- (1) Coat the threads of the jackscrew [6] with an anti-sieze compound and thread it into the push/pull plate [7] so that the threads just start to protrude from the plate.
- (2) Push the bullnose assembly [14 thru 17] into the jackscrew.
- (3) Set the five push plate spacers [4] around the wheel studs and slide the jackscrew/push/pull plate assembly over the wheel studs and flush to the spacers. Secure with five lug nuts.
- (4) Use the breaker bars [2] to move the axle into position. Move the assembly over to the other side if you move the axle too far (the axle should hang out an equal amount on both ends, +/- .020").

To remove the drive hub/tube assembly and axle:

- (1) Remove the live axle end cap (if used), axle nut retaining bolts, axle nut and spacer, and the eight nuts holding the tube to the case.
- (2) Attach the jackscrew and push/pull plate assembly as described earlier.
- (3) While holding the push/pull plate breaker bar stationary, turn the jackscrew breaker bar clockwise.

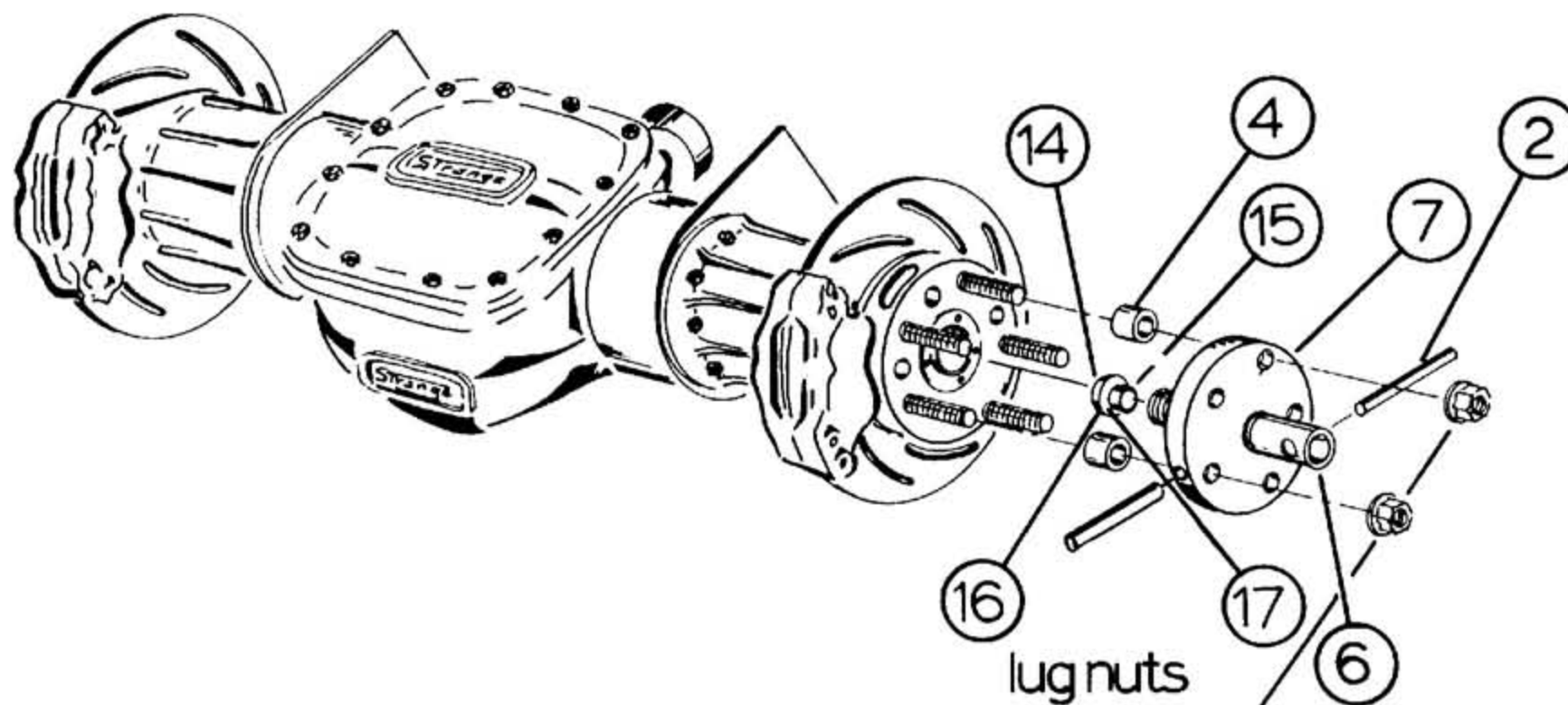


Figure seven. Setting and removing the axle nuts.

After the gear has been properly set up, the drive hubs and axle installed, and the gear backlash double checked, the axle nuts have to be set. These axle nuts serve two purposes:

- (1) Keep the axle from moving side to side.
  - (2) Share in supporting the weight of the vehicle.
- Therefore, careful attention should be given to ensure their proper installation.

(1) Coat the threads of the axle end and the mating surfaces of the axle nut and spacer with an anti-sieze compound.

(2) Set the axle nut spacer on the axle, past the threads and around the splines. Thread the axle nut on til snug.

(3) Using the spanner assembly [3 and 21] and a 1/2" extension (to clear the wheel studs), torque the nuts to 80 ft/lbs\*.

(4) Align two holes, 180 degrees apart, with the 1/4"-28 threaded holes in the drive hub. Secure with 1/4"-28 x 1" shcs (use 1/4"-28 x 1 1/4" shcs if using the axle end caps).

\* Have someone hold the pinion by the pinion nut using a socket and a breaker bar to keep the axle from turning.

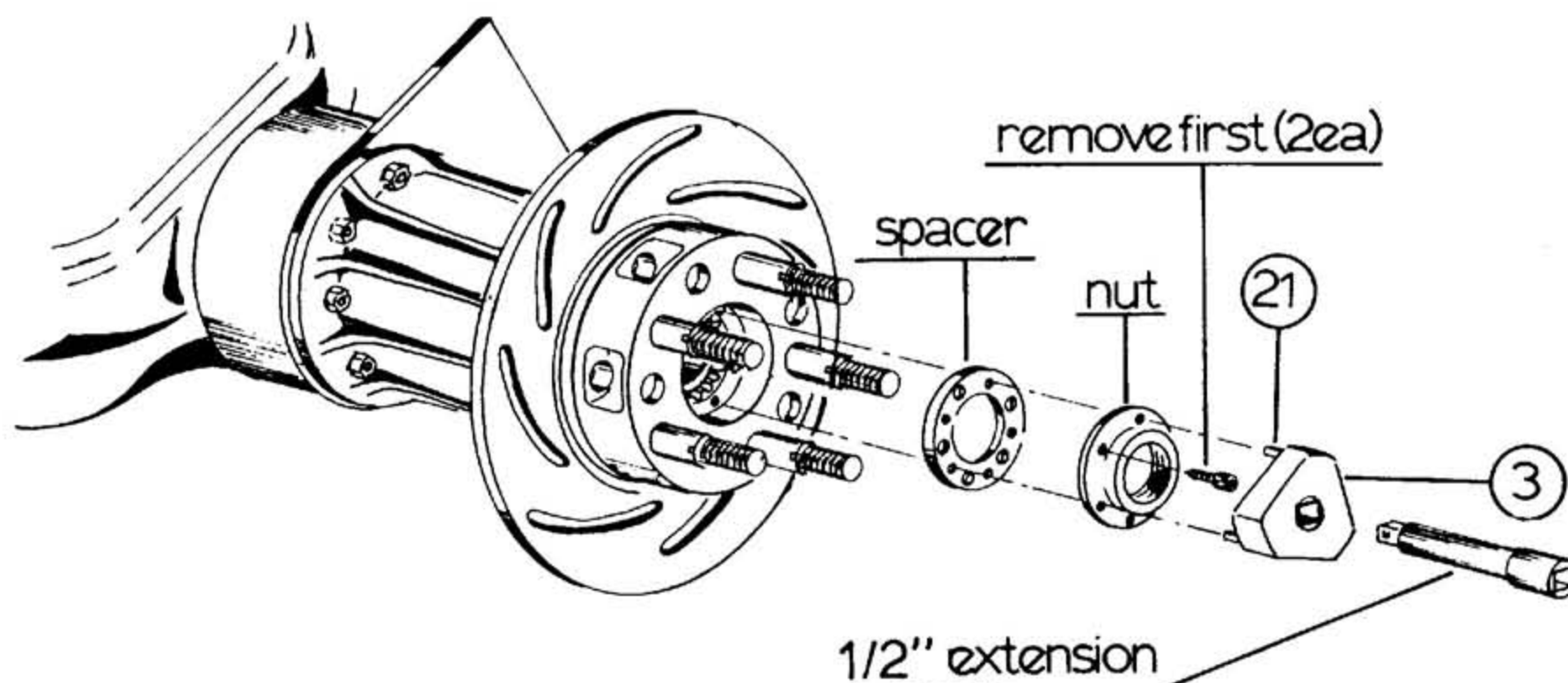


Figure eight. Removing the axle bearings.

Occasionally, it will become necessary to change the axle bearings or service the rotors.

- (1) Remove the drive hub/tube assembly (as outlined in figure three).
- (2) Separate the housing tube from the drive hub by removing eight 1/4"-28 nuts securing the assembly (by way of the access holes in the drive hub).
- (3) Remove the large snap ring from the drive hub stem.
- (4) Set the drive hub assembly in an arbor press, drive studs up, with the drive hub stem on top of the press block\*\*. Drop the bearing removal rods [5], chamfered end first, thru the access holes in the drive hub.
- (5) Rest the push/pull plate [7] on top of the bearing removal rods.
- (6) Push down on the plate to remove the bearing.

\*\* Press block not supplied. Just about any cylindrical object, 2 3/4" in diameter, will work for a press block (larger capacity wrench sockets for example).

