TERAFLEX INSTALLATION GUIDE

Installation Guide for the Bronco Dana 20 (LOW20B) low range gear kit for the Dana 20 transfer case for 1966-76 Broncos

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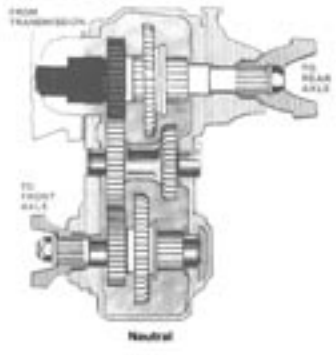
Verify that your kit contains each of the following items PRIOR to beginning installation:

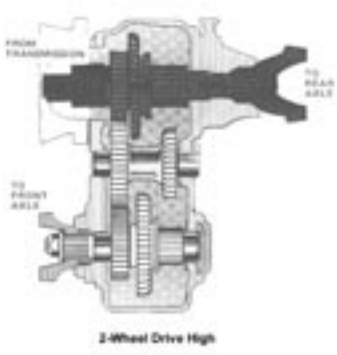
1 - Low20A	Main Drive Gear (6 spline)
1 - Low20DB	Front Output Gear (12 spline)
1 - Low20E	Rear Output Gear (15 spline)
1 - Low20C	Front Output Idler Gear
1 - Low20B	Intermediate Gear Double Gear
1 - TC20B	Gasket/seal set (SK20S)
1 - 20B-SR	Spacer Ring
1 - stckrtlow	TeraLow Sticker

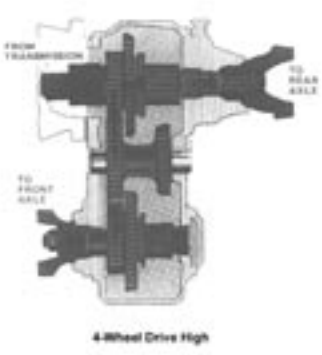
Replace stock gears with the TeraLow gears using standard procedures as outlined in the proper service manual with the following exception. **Install spacer (1.375" ID x 1.6" OD x 0.200" thick), included with this gear set, between the main drive gear and snap ring.**

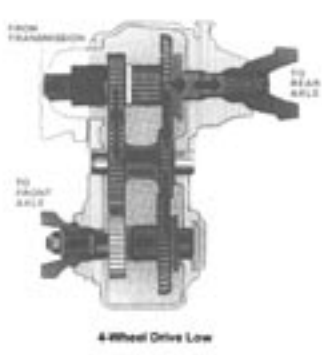
Attention: Verify that this is the appropriate kit to for your application prior to beginning work.

The Dana Bronco 20 transfer case is larger than a regular Dana 20 transfer case. Make sure you have the Low 20B kit for your Bronco Case. The Model 20 Transfer Case is a four-position type that provides two gear ratios in 4-wheel drive, one ratio in 2-wheel drive, and a neutral position. The TeraLow Low20 gear set, in 4-wheel drive low, provides a reduction ratio of 3.15:1 (a stock Model 20 has a ratio of 2.46:1) for off-road use and applications that require increased pulling power. Four-wheel drive high and 2-wheel drive high both provide 1:1 ratio in the transfer case. Neutral position is used for stationary power takeoff applications such as winching. In neutral, power is not transmitted to the wheels.
Power flow through the transfer case in the four positions is shown in the figures below. The darkened areas of the illustrations show which gears are engaged and the positions of the gears in various drive ranges.









revised 20 May 05

Removal

(1) Remove shift lever knob, boot, and shift lever.
(2) Raise and support vehicle and drain lubricant.
(3) Mark propeller shafts for reference at assembly and disconnect front and rear propeller shafts from output shaft yokes.
(4) Disconnect parking brake cable at equalizer.
(5) Disconnect speedometer cable at transfer case.
(6) Remove transfer-case-to-transmission attaching bolts and install one 3/8-16 x 4 inch dowel pin or cut a piece of all thread in 4-inch lengths to use in place of dowels on each side of case to use as guide for installation.
(7) Remove transfer case.
(8) Remove transmission-to-transfer case gasket.

Disassembly

NOTE: *Refer to exploded view for part identification.*

(1) Remove bottom cover and gaskets.
(2) Remove bolts attaching rear bearing cap assembly to transfer case and remove assembly.
(3) Remove the main shaft gear through front of case.
(4) Remove bottom cover.
(5) Remove intermediate shaft lock plate.
(6) Using brass drift and a plastic mallet, drive intermediate shaft out of rear of case.
(7) Remove intermediate gear assembly through bottom of case.
(8) Remove front output shaft nut and washer.



(9) Remove front output shaft yoke.
(10) Remove front oil seal.
(11) Remove cover plate attaching screws and remove cover.

CAUTION: *When removing cover plate, take care to avoid damage to the shims between the cover and case.*

(12) Position both shift rods in neutral.
(13) Remove rear output shaft shift fork setscrew.
(14) Remove poppet ball and spring plugs.
(15) Insert punch through pin hole in rod and rotate rear output shaft rod 1/4-turn counterclockwise and pull rod out of case.

NOTE: *When shift fork is free of rod, use hand to catch poppet ball and spring under shift rod.*

(16) Remove front shift rod housing attaching screws and slide housing from remaining shift rail.
(17) Remove front shift rod housing attaching screws and slide housing from remaining shift rail.

NOTE: *When housing is free of the rod, use hand to catch poppet ball and spring under shift rail.*

(18) Using hammer and brass drift, drive rear output shaft towards rear of case.
(19) Remove gears, spacer, and thrust washer from inside case and rotate shift rod to expose the setscrew.
(20) Remove setscrew and pull out shift rod.

Cleaning and inspection

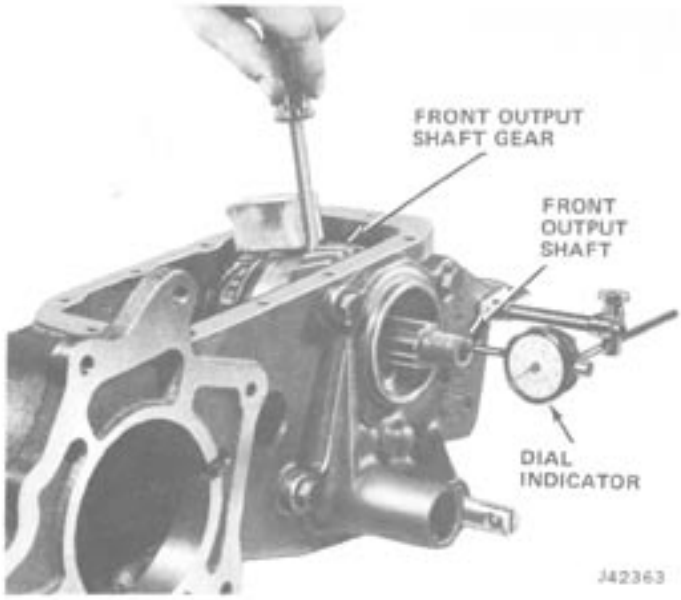
Wash all transfer case components and transfer case housing in solvent. Clean gasket material from all gasket surfaces and dry all components with compressed air.

Inspect all bearings, thrust washers, shafts and gears for excessive wear, pitting, and scoring. If any part is damaged or worn, it must be replaced.

Assembly

(1) Slide front output shaft shift rod partially into case.
(2) Place front output shaft shift fork on rod with bolt hole aligned with countersunk hole in rod.
(3) Install setscrew and tighten to 14 foot-pounds torque.
(4) Place rear output shaft shift fork in proper position in case.
(5) Set new rear output shaft sliding gear on shift fork with slot in gear facing rear of case.

(6) Install rear cone and roller on front output shaft.
(7) Insert front output shaft gears, thrust washers, and bearing in place and slide output shaft through both gears.



(8) Install front cone and roller on front output shaft.
(9) Install front and rear front output shaft bearing cups.
(10) Install rear bearing shims and cover plate, and tighten cover plate attaching bolts to 30 foot-pounds.
(11) Using suitable bearing driver, drive front cone and roller onto front output shaft.
(12) Place thrust washer on front output shaft.
(13) Place front output shaft shift rod detent spring in shift rod housing.
(14) Start housing onto front output shaft shift rod and place poppet ball on top of spring and depress into housing with a punch and tilt transfer case to slide interlock in to the right.
(15) Slide rear output shaft shift rod into housing far enough to retain poppet ball and interlock pin.
(16) Place large front output gear in case.
(17) Position rear output shaft shift rod with countersunk hole up and fork engaged in front output shaft sliding gear. Rotate rod 1/4-turn counterclockwise.
(18) Position and hold shift fork in case and push shift rod through fork.
(19) Rotate shift rod 1/4-turn clockwise and align countersunk hole in shift rod with hole in shift fork.
(20) Install setscrew and tighten to 14 foot-pounds torque.
(21) Install housing attaching bolts and tighten to 28 to 30 foot-pounds torque.
(22) Attach a dial indicator to shift rod housing to check front output shaft bearing adjustment.
(23) Pry shaft to extreme rear position and set indicator to zero.
(24) Pry shaft forward and read indicator. End play should be 0.001 inch to 0.003 inch which can be adjusted by changing the rear bearing cover shims.
(25) Assemble intermediate gear rollers and spacers with heavy grease.
(26) Place intermediate gear thrust washers in case with tangs aligned with grooves in case.

NOTE: *Thrust washers fit in case with tangs aligned with grooves in case. Rear washer can be held in place by starting intermediate shaft into case. Hold front washer in position with heavy grease.*

(27) Position intermediate gear in case and, using rawhide mallet or lead hammer, drive intermediate shaft into intermediate gear.
NOTE: *After intermediate gear is in place, rotate gear and check clearance to shift rail. Make sure the gear does not contact the rail. If it does you will need to mark the rail and remove it. Grind the area off the rail enough to make clearance.*
(28) Install intermediate shaft lock plate, lockwasher, and bolt. Tighten bolt to 14 foot-pounds torque.
(29) Install rear bearing cap assembly using a new gasket, and slide rear output shaft through gears. Tighten bearing cap bolts to 30 foot-pounds torque.
(30) Install front yoke seal.
(31) Install front propeller shaft yoke and tighten.
(32) Install bottom cover and gasket. Tighten bolts to 14 foot-pounds torque.

Installation
(1) Install new transmission-to-transfer case gasket on transmission.
(2) Shift transfer case to 4 WD low.
(3) Position transfer case on dowel pins.
(4) Rotate transfer case output shaft until the main shaft gear engages the rear output shaft gear of transfer case. Slide transfer case forward until transmission and transfer case mate.

CAUTION: *Be sure the transfer case is flush against transmission. Severe damage will result if the transfer case bolts are tightened while transfer case is binding.*

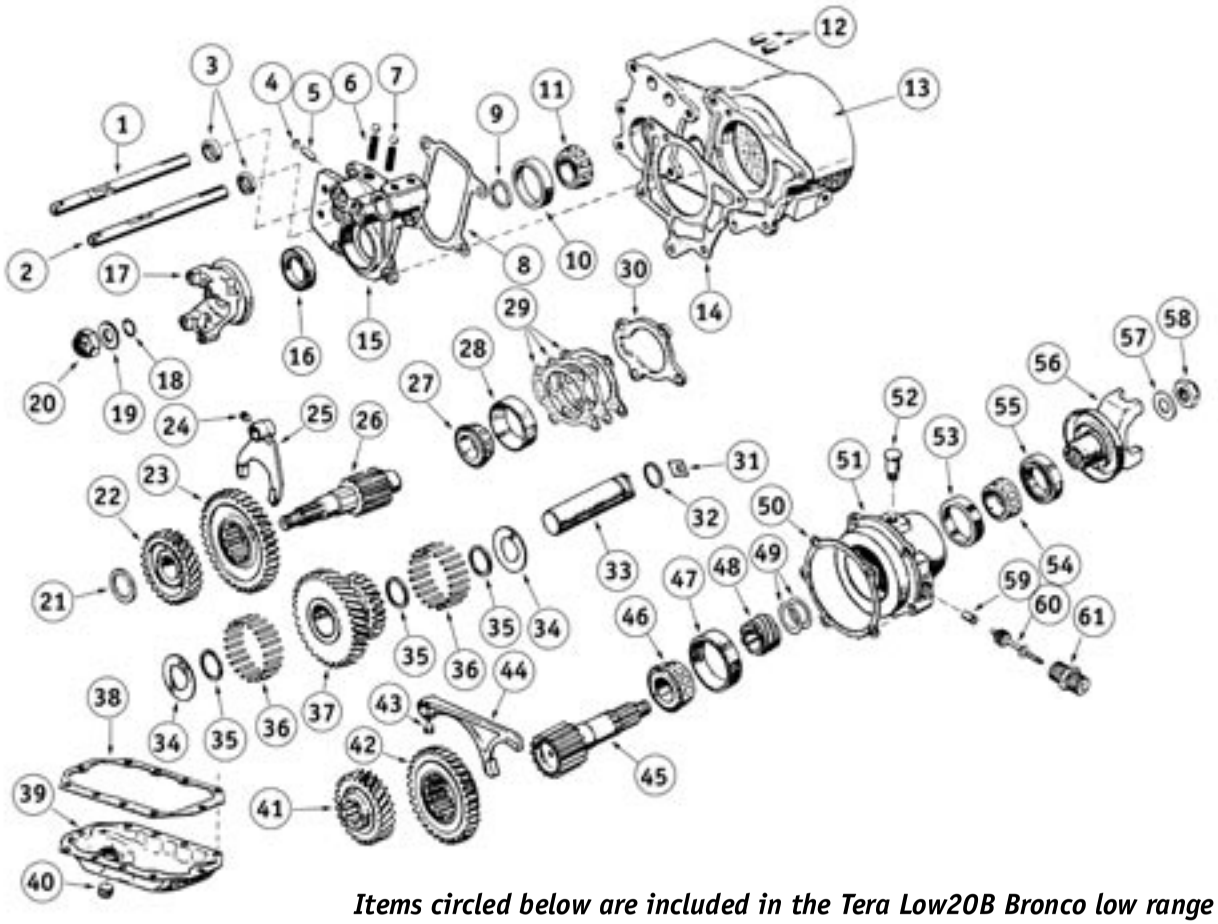
(5) Install one upper attaching bolt (snug bolt but do not tighten).
(6) Remove dowel pins and install all remaining attaching bolts. Tighten bolts to 30 foot-pounds torque.
(7) Connect speedometer cable and parking brake cable.
(8) Align reference marks and install propeller shafts. Tighten U-bolt nuts to 15 foot-pounds torque.
(9) Fill transfer case with SAE 80-90 Gear Lubricant of API, GL-4 quality to proper lever and check transmission fluid level. Synthetic oil is also recommended.
(10) Lower vehicle.
(11) Install transfer case shift lever, boot, and knob.

Transfer Case Specifications:
Type: Four-position
Make: Spicer
Model: 20
Gear Ratio:
High: 1:1
Low: 2.03:1 (stock)
with LOW20 3.15:1
Two-Wheel Drive: 1:1

Torque Specifications

Torque Specifications	Foot-Pounds
Front and Rear Output Shaft Yoke Nuts	225-250
Right and Left Shift Fork Setscrews	12-15
Shift Rod Housing to Case Bolts	28-30
Front Output Shaft Rear Bearing Cover to Case Bolts	28-32
Intermediate Shaft Lock Plate to Case Bolts	12-15
Rear Bearing Cap Assembly to Case Bolts	28-32
Lower Cover to Case Bolts	12-15
Transfer Case to Transmission Bolts	28-32

Towing Instructions
Disconnect driveline or place transmission in first gear if manual, and park if automatic. Put transfer-case in neutral. Lock in front hubs.



LOW20B

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Items circled below are included in the Tera Low20B Bronco low range gear kit

1. Shift Rod
2. Shift Rod
3. **Shift Rail Seal**
4. Shift Rail Interlock
5. Shift Rail Interlock
6. Detent Springs
7. Detent Balls
8. **Front Output & Shift Rail Housing Seal**
9. Washer
10. Front Output Bearing Race
11. Front Output Bearing
12. Shift Rail Caps
13. Case Housing
14. **Tranny to Transfer Case Gasket**
15. Front Output & Shift Rail Housing
16. **Front Yoke Seal**
17. Front Output Yoke
18. Yoke O-ring
19. Flat Washer
20. Companion Flange Nut
21. Washer
22. **Front Output Gear (TL20-C)**
23. **Front Sliding Gear (TL20-DB)**
24. Shift Fork Set Screw
25. Front Wheel Drive Shift Fork
26. Front Output Shaft
27. Front Output Bearing
28. Front Output Bearing Race
29. Front Output Bearing Cap Set
30. Front Bearing Cap
31. Intermediate Gear Shaft Retainer
32. **Intermediate Gear Shaft O-ring**
33. **Intermediate Gear Shaft**
34. **Thrust Washer (2)**
35. **Bearing Spacer (3)**
36. **Needle Bearings**
37. **Intermediate Gear (TL20-B)**
38. **Cover Gasket**
39. Cover
40. Drain Plug
41. **Main Drive Gear (TL20-A)**
42. **Rear Sliding Gear (TL20-E)**
43. Set Screw
44. Rear Wheel Drive Shift Fork
45. Rear Output Shaft
46. Rear Output Bearing
47. Rear Output Bearing Race
48. Speedometer Drive Gear
49. Rear Output Shaft Shims
50. **Rear Output Housing Gasket**
51. Rear Output Housing
52. Breather
53. Rear Output Bearing Race
54. Rear Output Bearing
55. **Rear Output Yoke Seal**
56. Rear Output Yoke
57. Flat Washer
58. Companion Flange Nut
59. Speedo Driven Gear Busing
60. Speedometer Driven Gear
61. Spedometer Driven Gear Sleeve