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# **GEARLESS CENTRE DIFFERENTIAL**

**FULL-TIME 4X4 TRANSFER CASE CONVERSION**

**DUAL RANGE  
HIGH SPEED  
GCD**

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## **INSTALLATION MANUAL**

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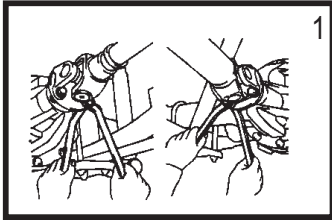
**for**

**TOYOTA LANDCRUISER  
HZJ 75/78/79**

See our website  
[www.gearingdynamics.com](http://www.gearingdynamics.com)  
Email: [service@gearingdynamics.com](mailto:service@gearingdynamics.com)

# DISASSEMBLY PROCEDURE

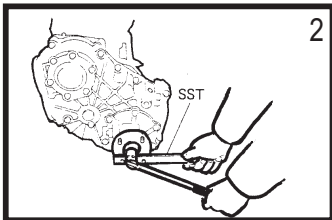
## DUAL RANGE - HIGH SPEED



1

### THIS SEQUENCE APPLIES ONLY TO MANUAL/MECHANICAL TYPE TRANSFER CASE

**NOTE:** Transfer case does not need to be removed from the vehicle for GCD installation.



2

#### 1. REMOVE REAR PROP- SHAFT.

Discard shaft, a shorter shaft is supplied with GCD kit.

#### 2. REMOVE REAR COMPANION FLANGE.

- Using hammer and chisel release staked part of nut.
- Using SST hold the companion flange whilst removing lock nut.
- Remove the companion flange from shaft.

#### 3. UNDO TRANSFER HIGH & LOW SHIFT LEVER

#### 4. REMOVE SPEEDO DRIVEN GEAR AND CABLE.

#### 5. REMOVE REAR OUTPUT SHAFT REAR BEARING HOUSING

- Discard housing, a new one is supplied with GCD kit.
- Remove the six bolts
  - Remove the speedometer drive gear and spacer.  
Discard spacer, a new one is supplied in kit.

#### 6. REMOVE POWER TAKE-OFF COVER.

This allows access to the transfer case bolts.

#### 7. REMOVE IDLER GEAR SHAFT LOCK PLATE.

#### 8. REMOVE TRANSFER REAR CASE.

- Remove the bolts
- Using a plastic hammer split and remove the transfer case half.

**NOTE:** Use extreme caution in splitting the case, keeping the split even so that the case does not jam. The separation is helped by tapping the idler shaft in.

#### 9. REMOVE REAR OUTPUT SHAFT ASSEMBLY.

Remove shift fork and shaft and slide out assembly.

**NOTE:** 1 Gear box must be in neutral.  
2 Transfer case must be in 2 WD.

#### 10. REMOVE IDLER SHAFT O-RING.

#### 11. REMOVE REAR OUTPUT SHAFT FRONT BEARING RETAINER.

#### 12. INSTALL NEW BEARING CUP INTO FRONT BEARING RETAINER

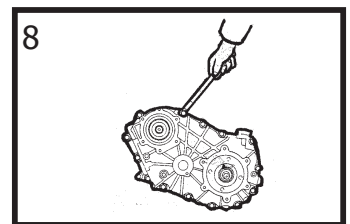
A new cup is supplied in GCD KIT

#### 13. INSTALL NEW REAR OUTPUT SHAFT REAR BEARING CUP INTO GCD EXTENSION HOUSING.

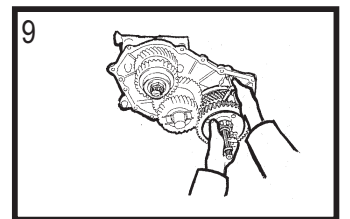
- A new cup is supplied in GCD KIT
- Install the **ORIGINAL** shim under the bearing cup.



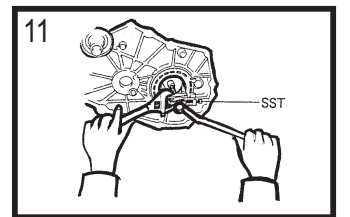
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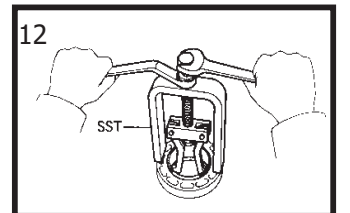
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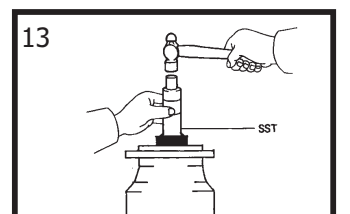
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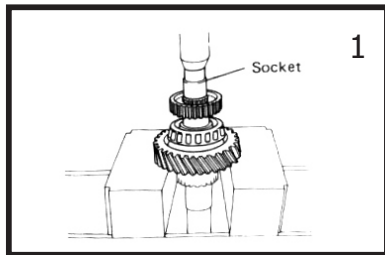
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# ASSEMBLY

## PREPARE NEW REAR OUTPUT SHAFT ASSY



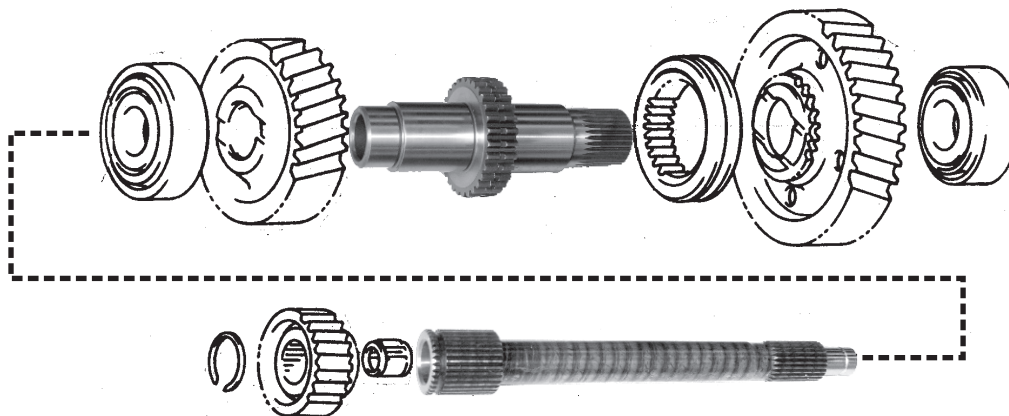
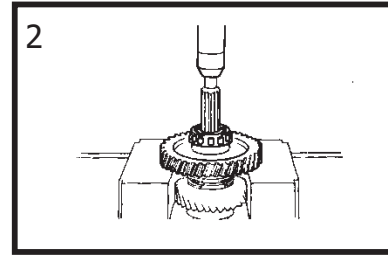
**NOTE:** High and low gears are removed and re-assembled onto the new output shaft supplied in the kit.

### 1. REMOVE HIGH GEAR FROM TOYOTA OUTPUT SHAFT

- Using snap ring pliers, remove snap ring.
- Using a press and socket wrench, remove the following  
Clutch Hub; Front bearing; High gear; Clutch sleeve.

### 2. REMOVE LOW GEAR FROM TOYOTA OUTPUT SHAFT

- Using a press remove the following parts:  
Rear bearing; Low gear,



### 3. INSTALL HIGH GEAR TO NEW REAR OUTPUT SHAFT

**NOTE:** High gear is pressed onto end **WITHOUT** spline.

Press on the following parts:  
High gear, Output shaft front bearing, (TR 070902)

### 4. INSTALL LOW GEAR TO NEW REAR OUTPUT SHAFT

**NOTE:** Low gear is installed onto **SPLINED** end.

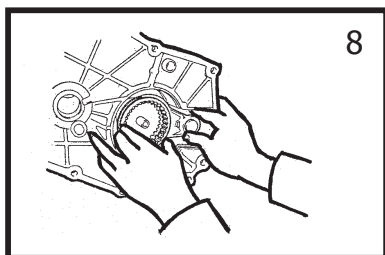
Press on the following parts:  
Clutch sleeve, Low gear,  
Output shaft rear bearing. (4T 30307C)

### 5. INSTALL CLUTCH HUB ONTO GCD FRONT DRIVE THRU-SHAFT

### 6. INSTALL SNAP RING ONTO THRU-SHAFT

### 7. INSERT THRU-SHAFT INTO REAR OUTPUT SHAFT ASSEMBLY

Insert Thru-shaft into High gear end of Output shaft.



## ASSEMBLY INTO TRANSFER CASE

### 8. INSTALL CLUTCH SLEEVE TO FRONT OUTPUT SHAFT

Install clutch sleeve with shift fork and shaft.

### 9. INSTALL REAR OUTPUT SHAFT FRONT BEARING RETAINER

### 10. INSTALL REAR OUTPUT SHAFT ASSEMBLY WITH SHIFT FORK AND SHAFT TO FRONT OUTPUT SHAFT

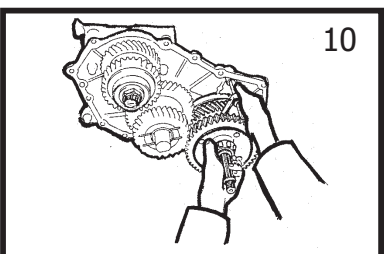
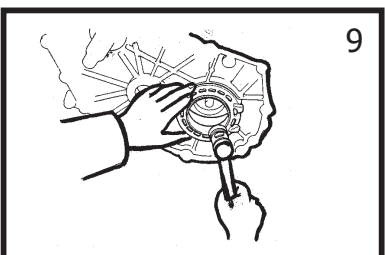
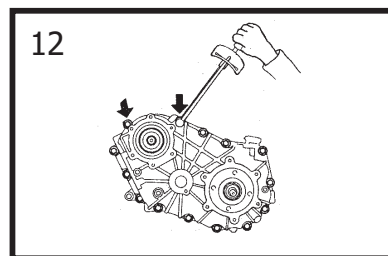
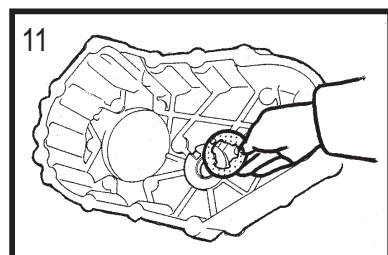
### 11. STICK THRUST WASHER TO TRANSFER REAR CASE

### 12. INSTALL TRANSFER REAR CASE

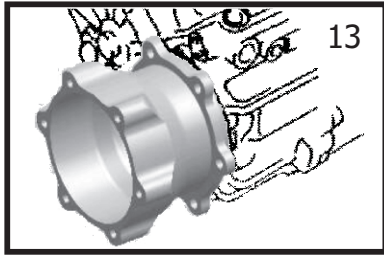
- Place a new gasket on the front case.
- Install the rear case.
- Apply Loctite to the two bolts, and install and torque as shown.

**Torque: 650 kg-cm (47 ft.lb, 64 N-m)**

- Install and torque other bolts  
**Torque: 17mm 650 kg-cm (47ft-lb, 64 N-m)**  
**14mm 400 kg-cm (29 ft-lb, 39 N-m)**



## **ADJUSTING REAR OUTPUT SHAFT BEARING PRELOAD**



### **13. INSTALL GCD EXTENSION HOUSING WITH OUTPUT SHAFT REAR BEARING CUP**

- (a) Place new gasket onto Extension Housing
- (b) Fit Extension Housing to Transfer rear case.
- (c) Torque the six new bolts supplied.
- (d) Shift the transfer lever to the "N" position.

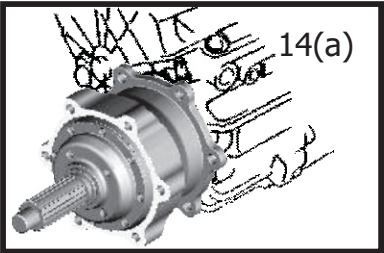
### **14. INSTALL GCD REAR OUTPUT HEMI ASSEMBLY**

- (a) Holding onto shaft, insert hemi assembly through Extension housing and slide onto splines of rear output shaft and thru-shaft.
- (b) Temporarily install rear companion flange nut.
- (c) With the gearbox still in neutral and using a torque meter, measure the rear output preload. (starting torque)

**Preload: New Bearings  
(13 -21.4 in-lb, 1.5 2.4 N-m)**

If the preload does not fall within the specifications, remove the Extension Housing and alter the shim under the bearing cup.

- (d) Remove the six Extension Housing bolts and re-install using Loctite and torque as follows  
**Torque: (25 ft-lb, 34 N-m)**



### **15. INSTALL SPEEDO DRIVE GEAR ONTO SHAFT**

### **16. INSTALL NEW SPACER ONTO SHAFT (9.5mm)**

Supplied in GCD kit.

### **17. INSTALL REAR OUTPUT SHAFT ROLLER BEARING INTO GCD SPEEDO DRIVE HOUSING**

Using suitable tool tap bearing and seat into housing.

### **18. INSTALL CIRCLIP INTO SPEEDO DRIVE HOUSING**

### **19. PRESS NEW SEAL INTO SPEEDO DRIVE HOUSING**

### **20. INSTALL NEW SPEEDO DRIVE HOUSING**

NOTE: Rotate housing 180 deg (3 bolt holes) from standard position.

- (a) Place new special gasket (supplied) onto housing
- (b) Apply Loctite to the 6 bolts
- (c) Install bolts and torque as follows

**Torque: (25 ftlb, 34Nm)**

### **21. INSTALL NEW DUST DEFLECTOR ONTO REAR COMPANION FLANGE**

(Supplied with GCD kit)

New deflector is same as front.

### **22. INSTALL REAR COMPANION FLANGE**

- (a) Install the companion flange.
- (b) Using SST to hold companion flange, install the companion flange lock nut.
- (c) Stake companion flange lock nut.

**Torque: (94 ft-lb, 127Nm)**

### **23. INSTALL POWER-TAKE-OFF COVER.**

- (a) Install the cover with gasket.
- (b) Apply liquid sealer to the two bolts and install and torque as follows: TORQUE: (12 ft-lb, 17Nm)
- (c) Install and torque the other bolts.

### **24. REPLACE SPEEDOMETER DRIVEN GEAR OIL SEAL.**

(Only if necessary)

### **25. INSTALL SPEEDO DRIVEN GEAR AND CABLE (75) OR DRIVEN GEAR AND SENSOR (78,79)**

### **26. INSTALL SPEEDO WIRING LOOM EXTENSION (78,79)**

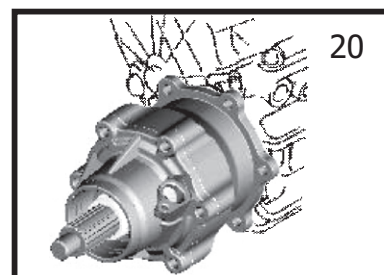
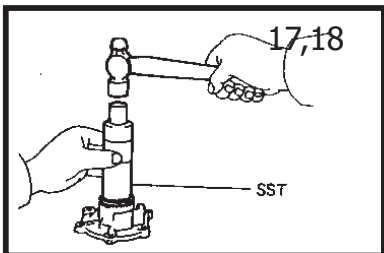
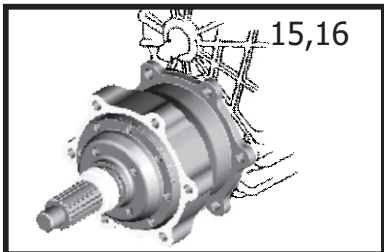
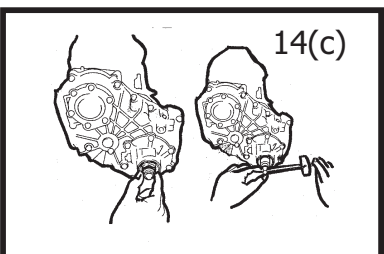
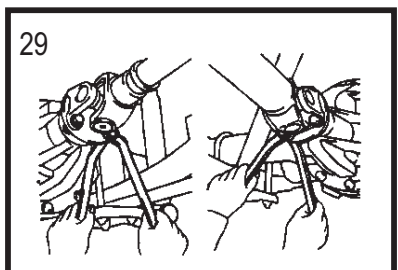
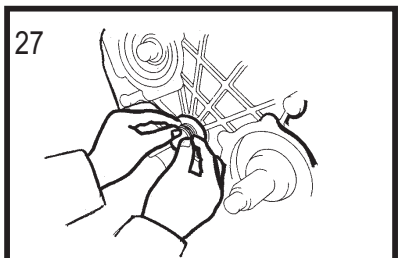
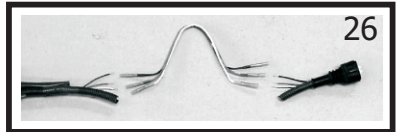
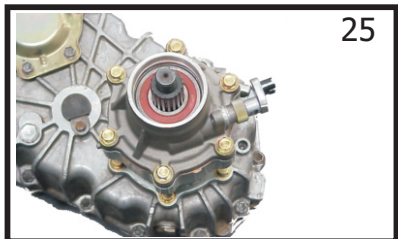
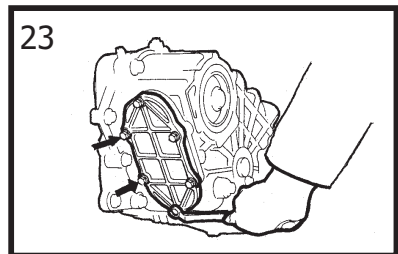
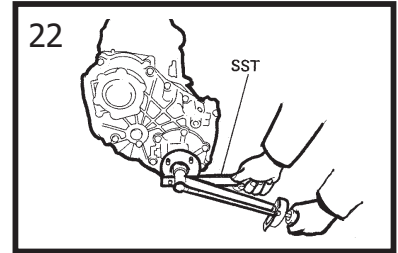
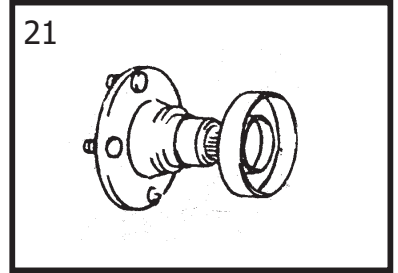
- (a) Rotate speed housing to new position.
- (b) Cut and strip the 3 speedo sensor wires inside the corrugated loom at about 100mm from the sensor.
- (c) Insert each of 3 wires into matching connector and crimp tight.
- (d) Activate heat shrink using lighter or match.
- (e) Secure loom onto chassis using zip ties.

### **27. INSTALL IDLER SHAFT O-RING AND LOCPLATE**

- (a) Align the shaft groove to the bolt hole.
- (b) Install O-ring on the shaft groove.
- (c) Using plastic hammer, drive in the shaft.
- (d) Install the lock plate and bolt.

### **28. RECONNECT TRANSFER HIGH & LOW SHIFT LEVER.**

### **29. INSTALL NEW REAR PROP- SHAFT. (Supplied)**



## GCD OPERATIONAL TEST

The GCD is designed to un-lock and re-lock the common drive to front and rear axles when one axle attempts to overdrive the other axle during cornering.

**NOTE:** The above de-coupling action operates in all gears both forward and reverse.

### DE-COUPLE SIMULATION

1. With the vehicle **checked for safety at the REAR wheels** raise the front axle wheels off the ground.
2. **FIRST LIGHTLY** rotate the PROP- SHAFT of the raised axle both clockwise and anti-clockwise.

**Observation:** The transfer case common axle drive should be solid and not capable of independent drive.

3. **NOW FIRMLY** rotate the driveshaft of the raised axle and the de-coupling can be felt as the prop-shaft breaks out and spins freely. Reverse the rotation of the raised axle prop-shaft and the re-coupling will occur.
4. Lower the raised axle and repeat the steps to check the REAR axle.

### FOR OPTIMUM PERFORMANCE

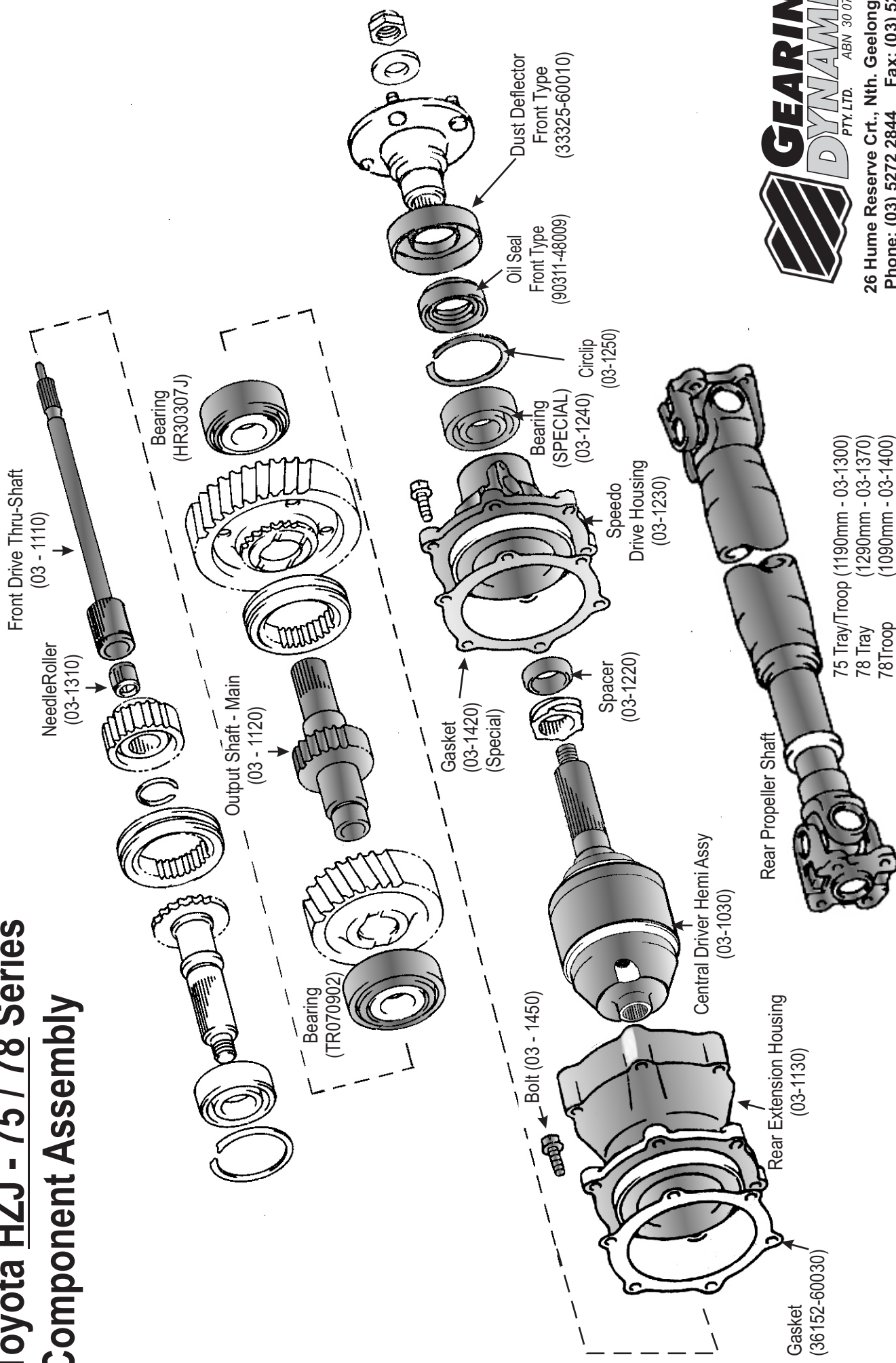
- NOTE:**
1. It is very important that all 4 wheels are of matching diameter for optimum traction and performance.
  2. During slow, tight cornering, the GCD may be heard indexing as it un-locks and re-locks. This is quite normal.

### GCD KIT PARTS LIST

03 1030	1 x	Central Driver Hemi Assembly	
03 1110	1 x	Front Drive Thru-shaft	
03 1120	1 x	Output Shaft - Main	
03 1130	1 x	Rear Extension Housing	
03 1220	1 x	Spacer (9.5mm)	
03 1230	1 x	Speedo Drive Housing	
03 1240	1 x	Bearing- Speedo Housing	(SPECIAL)
03 1250	1 x	Circlip	(1300-72)
03 1260	1 x	Oil Seal- Speedo Housing	(90311-48009)
03 1270	1 x	Dust Deflector- Flange	(33325-60010)
03 1450	6 x	Bolts- Speedo Housing	
03 1280	1 x	Bearing- Rear output front	(TR 070902)
03 1290	1 x	Bearing- Rear output rear	(HR30307J)
03 1300 (75)	1 x	Rear Propeller Shaft (1190mm)	(Special)
03 1370 (78) <sub>Tray</sub>	1 x	Rear Propeller Shaft (1290mm)	(Special)
03 1400 (78) <sub>Troop</sub>	1 x	Rear Propeller Shaft (1090mm)	(Special)
02 1280	1 x	Gasket- Transfer rear case	(36143-60020)
02 1270	1 x	Gasket- Extension Housing	(36152-60030)
03 1420	1 x	Gasket- Speedo Housing	(Special)
02 1210	1 x	Locknut-	90179-22005
02 1340	1 x	Caution Sticker- Dashboard	
03 1390	1 x	Installation Manual	

# GEARLESS CENTRE DIFFERENTIAL - 2 Speed Transfer Case Conversion

## Toyota HZJ - 75 / 78 Series Component Assembly



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