

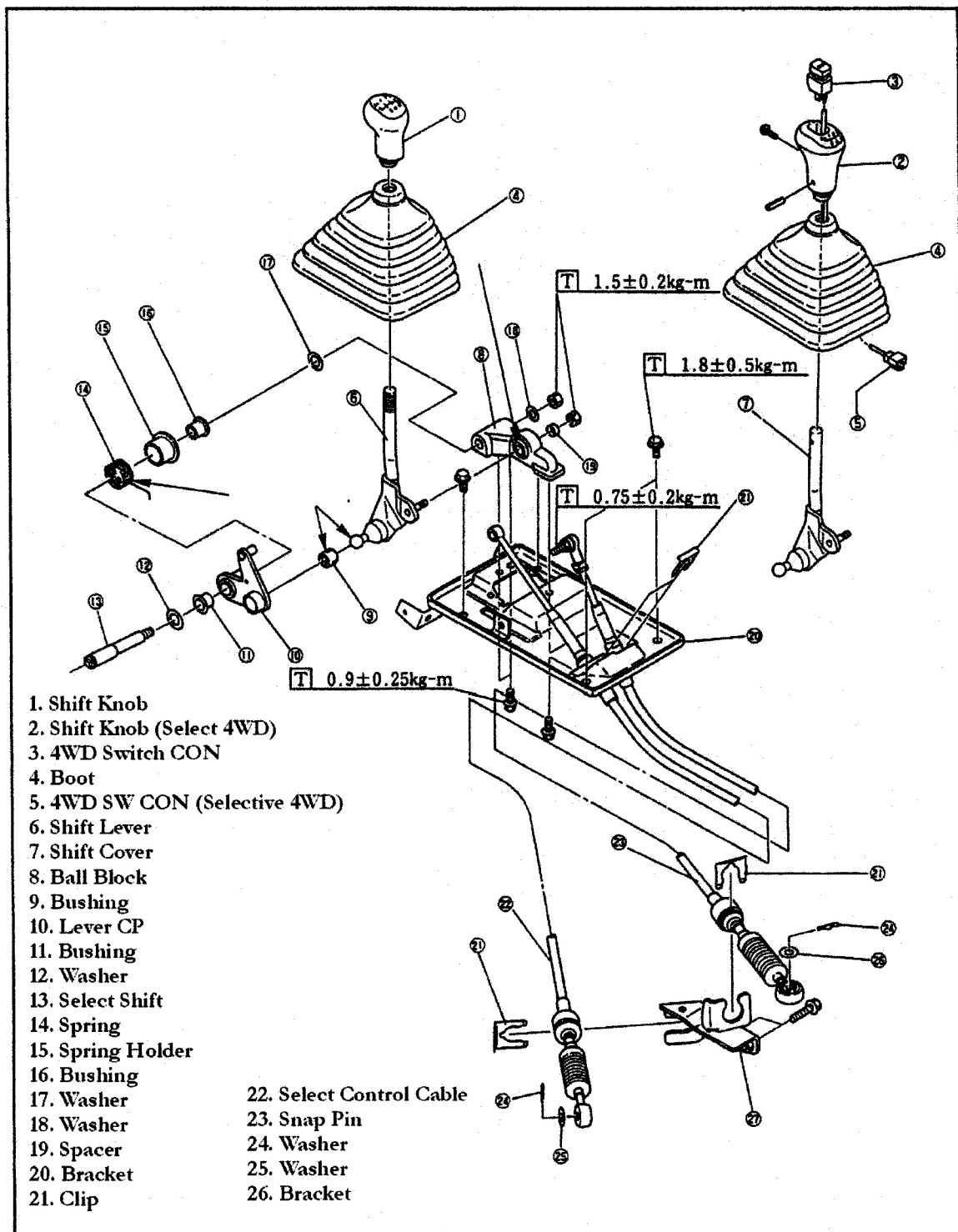
# **Chapter 11**

## **Transmission and Differential 2WD - 4WD**

- 21. Gear Shift System**
- 22. TM 60 Series 2WD Clutch Housing - Main Case - Side Case**
- 23. TM 60 Series 2WD Main Shaft-Drive Pinion- Reverse Idler Shaft**
- 24. TM 60 Series 2WD Shift & Select System**
- 25. TM 60 Series 2WD Differential**
- 26. TM 60 Series Selective 4WD Transmission Case Assembly**
- 27. TM 60 Series Selective 4WD Shifter and Selector System**
- 28. TM 60 Series Selective 4WD Drive Pinion-Main Shaft-Reverse Idler**
- 29. TM 60 4WD Differential**
- 30. TM 60 4WD Diff-Lock Differential Option**
- 31. TM 60 4WD Diff-Lock Side Cover Assembly**
- 32. TM 60 Selective 4WD Transfer Extension**
- 33. Clutch & Pressure Plate Specifications**
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- 35. Clutch Cable Adjustment**
- 36. Release Bearing and Fork**
- 37. Clutch Disk – Flywheel – Pressure Plate**
- 38. Clutch Assembly**
- 39. Axel Shaft System**
- 40. Axel Shaft Identification and Type**

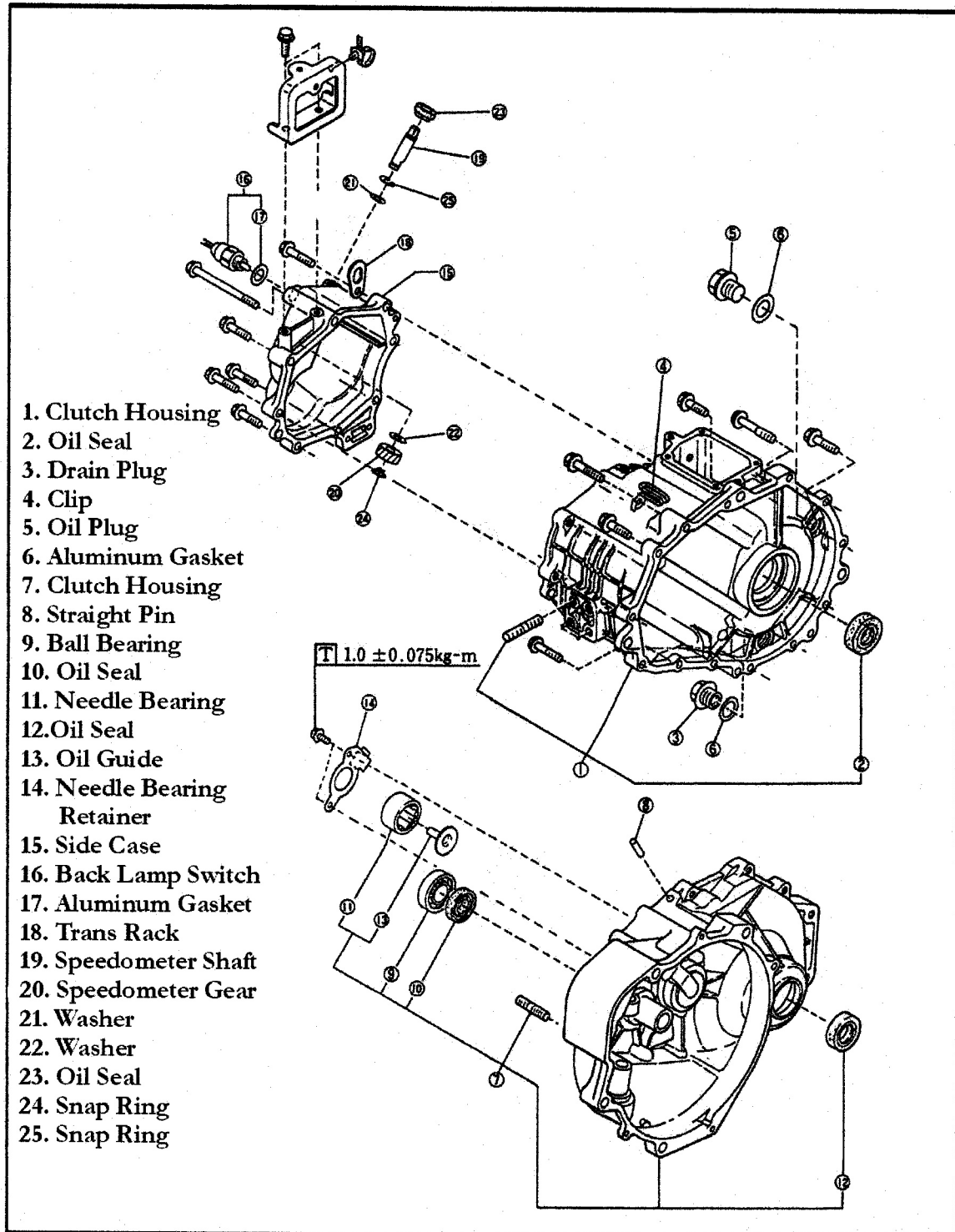
# Transmission

## Gear Shift System



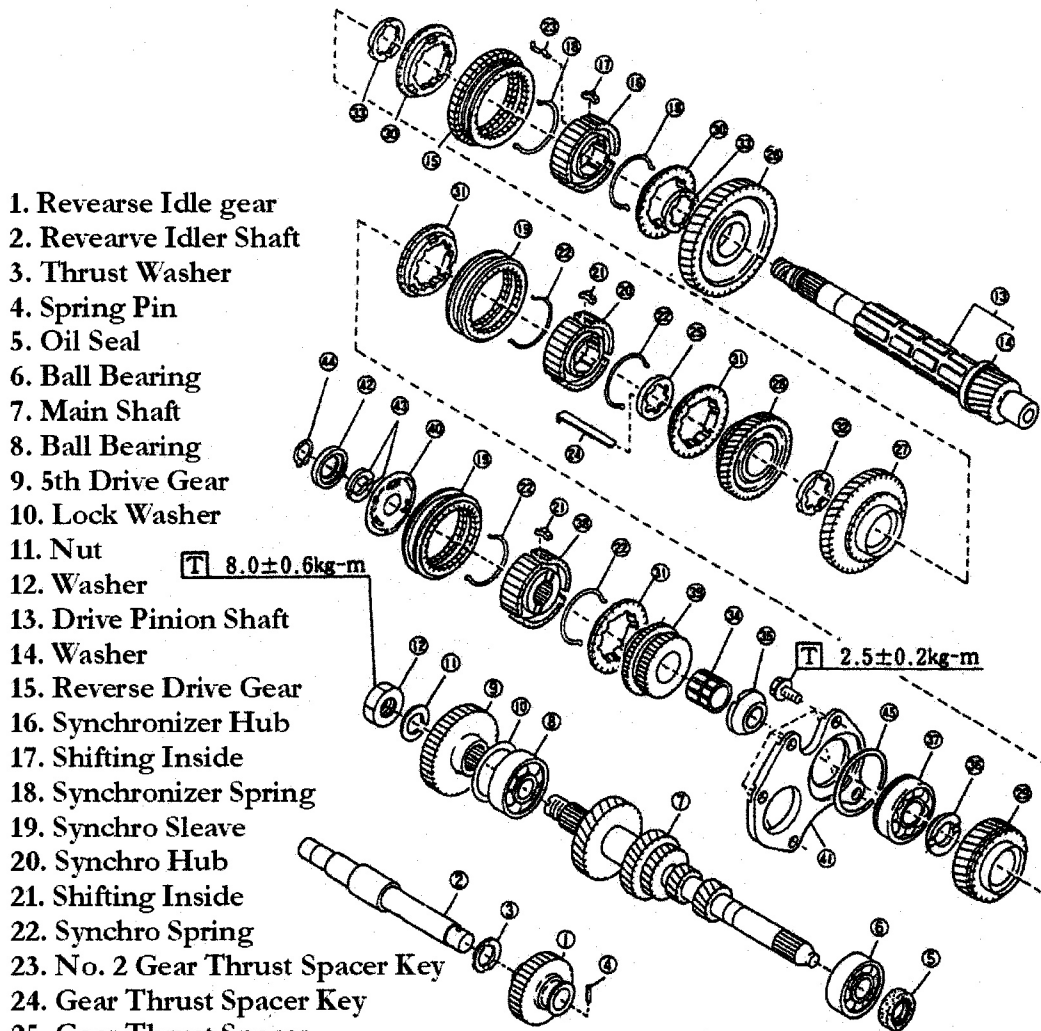
## TM 60 Series 2WD

### Clutch Housing - Main Case - Side Case



## TM 60 Series 2WD

### Main Shaft - Drive Pinion Shaft - Reverse Idler Shaft



1. Reverse Idle gear
2. Reverse Idler Shaft
3. Thrust Washer
4. Spring Pin
5. Oil Seal
6. Ball Bearing
7. Main Shaft
8. Ball Bearing
9. 5th Drive Gear
10. Lock Washer
11. Nut

T 8.0±0.6kg-m

12. Washer
13. Drive Pinion Shaft
14. Washer
15. Reverse Drive Gear
16. Synchronizer Hub
17. Shifting Inside
18. Synchronizer Spring
19. Synchro Sleeve
20. Synchro Hub
21. Shifting Inside
22. Synchro Spring
23. No. 2 Gear Thrust Spacer Key
24. Gear Thrust Spacer Key
25. Gear Thrust Spacer

T 2.5±0.2kg-m

26. 1st Drive Gear
27. 2nd Drive Gear
28. 3rd Drive Gear
29. 4th Drive Gear
30. Synchronizer Ring
31. Synchronizer Ring
32. No. 3 Gear Thrust Spacer
33. No.4 Gear Thrust Spacer
34. Bushing
35. 5th Drive Thrust Plate

36. Thrust Washer
37. Drive Pinion Center Bearing
38. Synchronized Hub
39. 5th Drive Gear
40. Inside Stopper Plate
41. Retainer Plate
42. Retainer
43. Cotter Pin
44. Snap Ring
45. Snap Ring

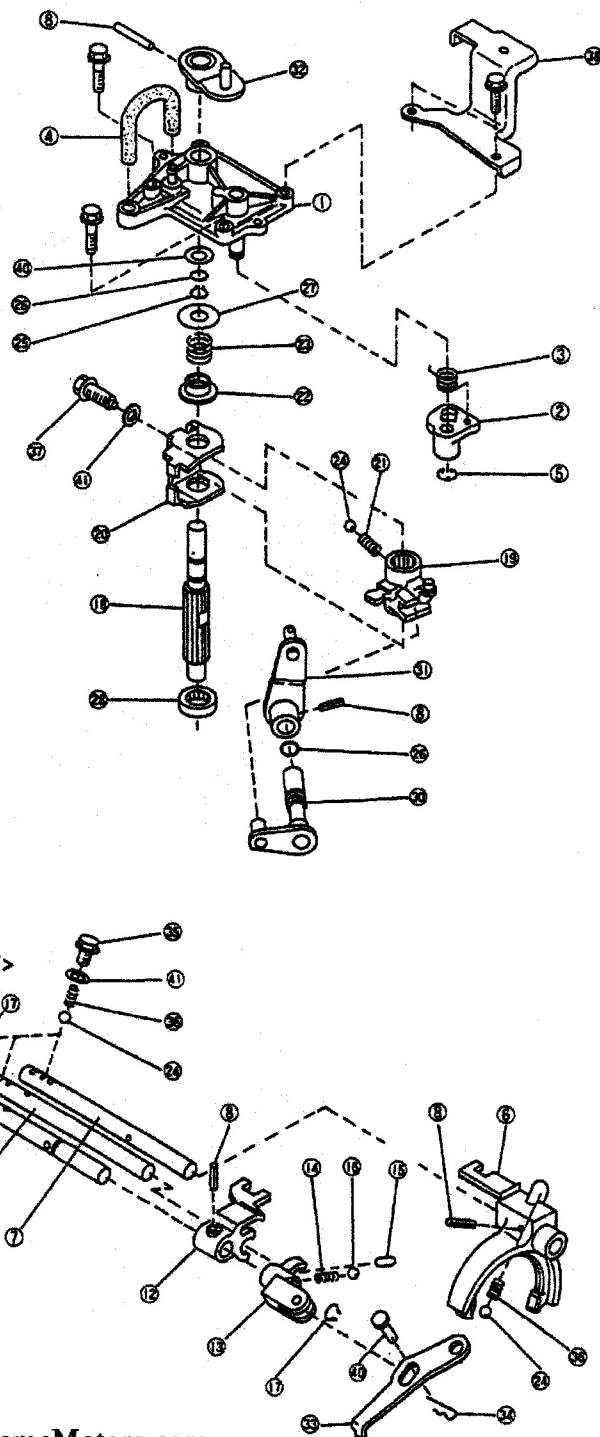
Yokohamamotors.com



## TM 60 Series 2WD

### Shift & Select

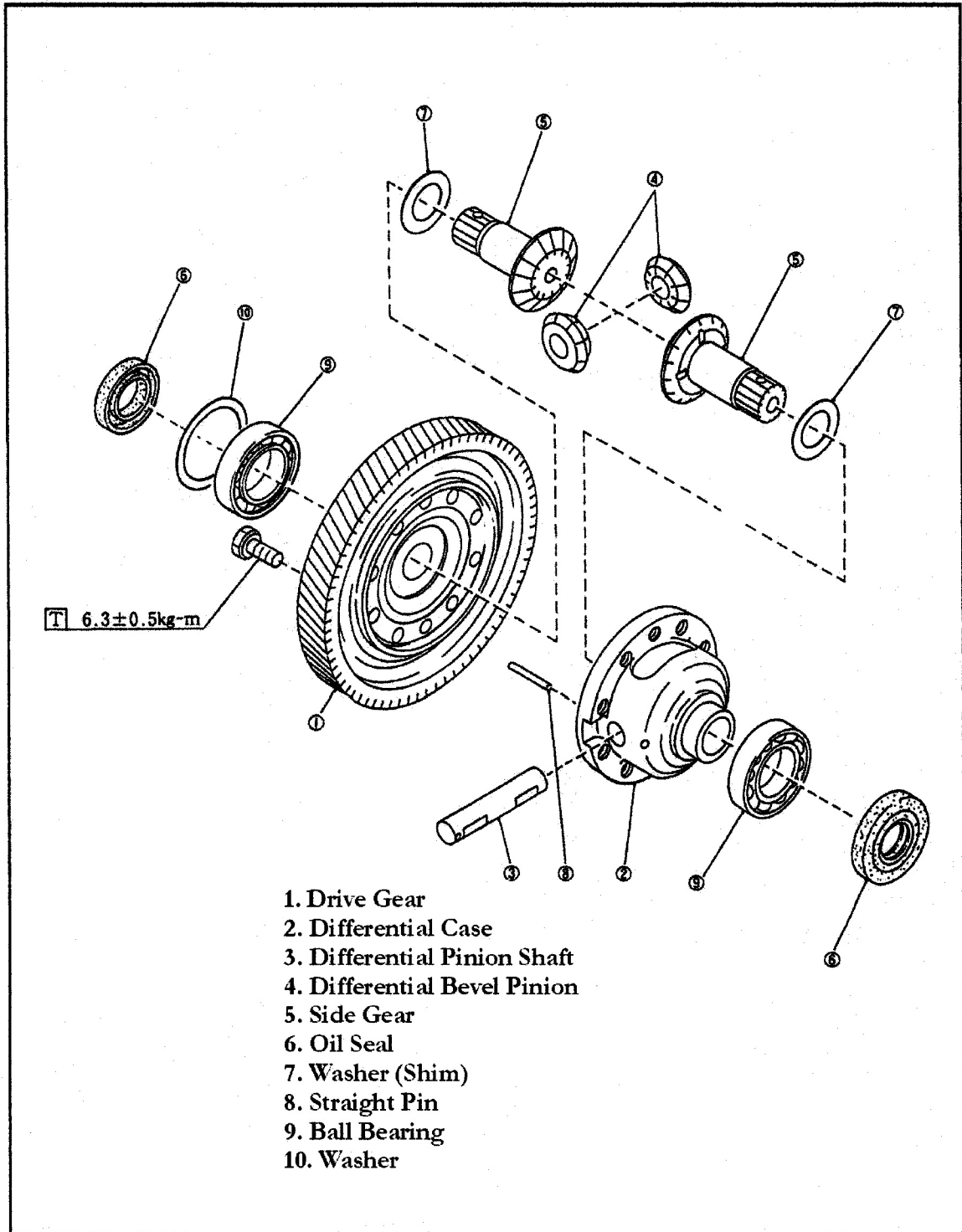
1. Transmission Cover CP
2. Reverse Check Cam
3. Reverse Check Spring
4. Air Breather Pipe
5. Clip
6. 1-2 Gear Shifter Fork
7. 1-2 Gear Fork Rod
8. Spring Pin
9. 3-4 Gear Shift Fork
10. 3-4 Gear Fork Rod
11. 5th Gear Reverse Fork Rod
12. Reverse Shift Arm
13. No.2 Reverse Arm
14. Reverse Shifter Arm Spring
15. Plunger
16. Ball (5.5563)
17. Snap Ring
18. shifter Shaft
19. Shifter Arm
20. Interlock Plate
21. Checking Spring
22. Spring Retainer
23. Reverse Return Spring
24. Check Ball
25. Snap Ring
26. O Ring
27. Washer
28. Collar
29. 5th Gear Shifter Fork
30. Selector Shaft
31. Selector Lever
32. Shifter Lever
33. Reverse Shifter Lever
34. Snap Pin
35. Check Ball Plug
36. Check Ball Spring
37. Interlock Bolt
38. Braket
39. Washer
40. Pin
41. Washer



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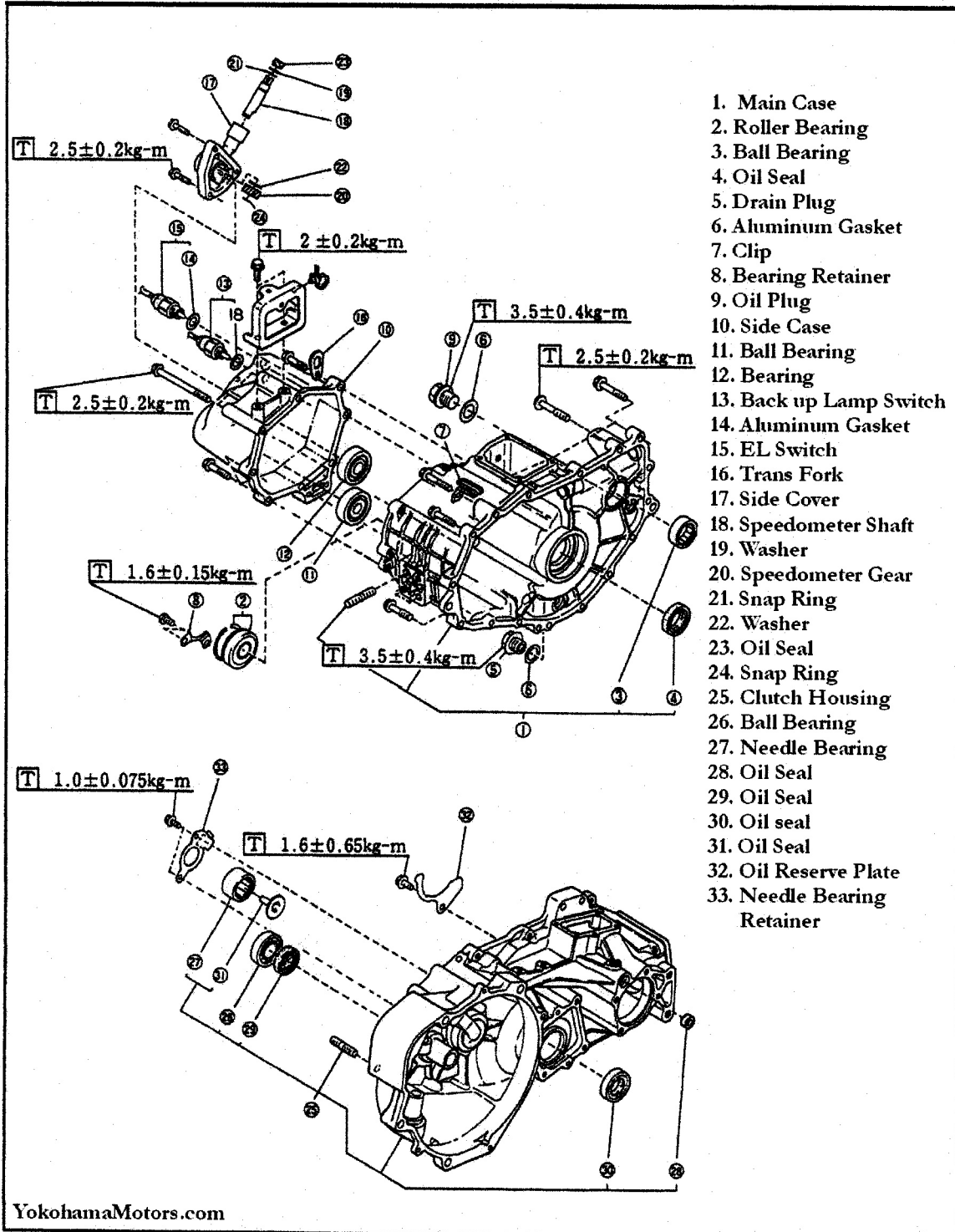
## TM 60 Series 2WD

### Differential



## TW 60 Series Selective 4WD

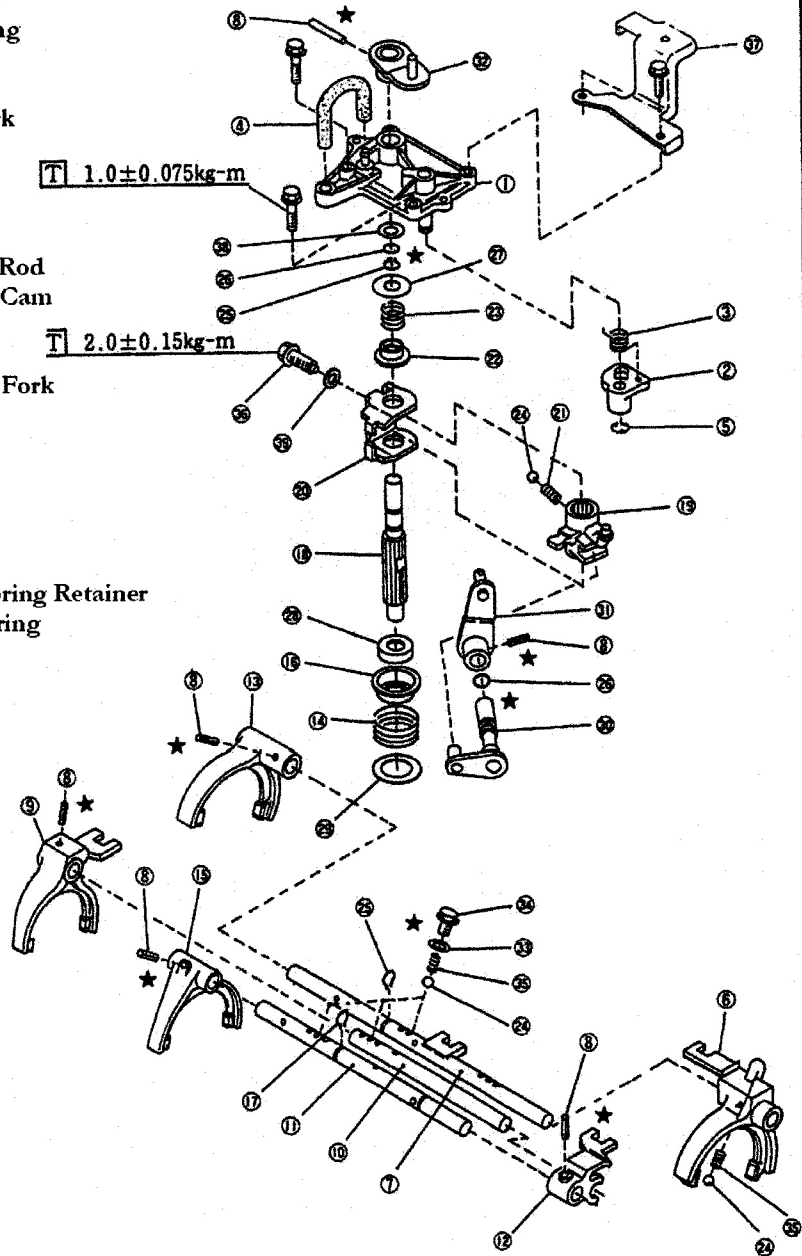
### Transmission Case Brakedown



## TW 60 Series Selective 4WD

### Shifter and Selector

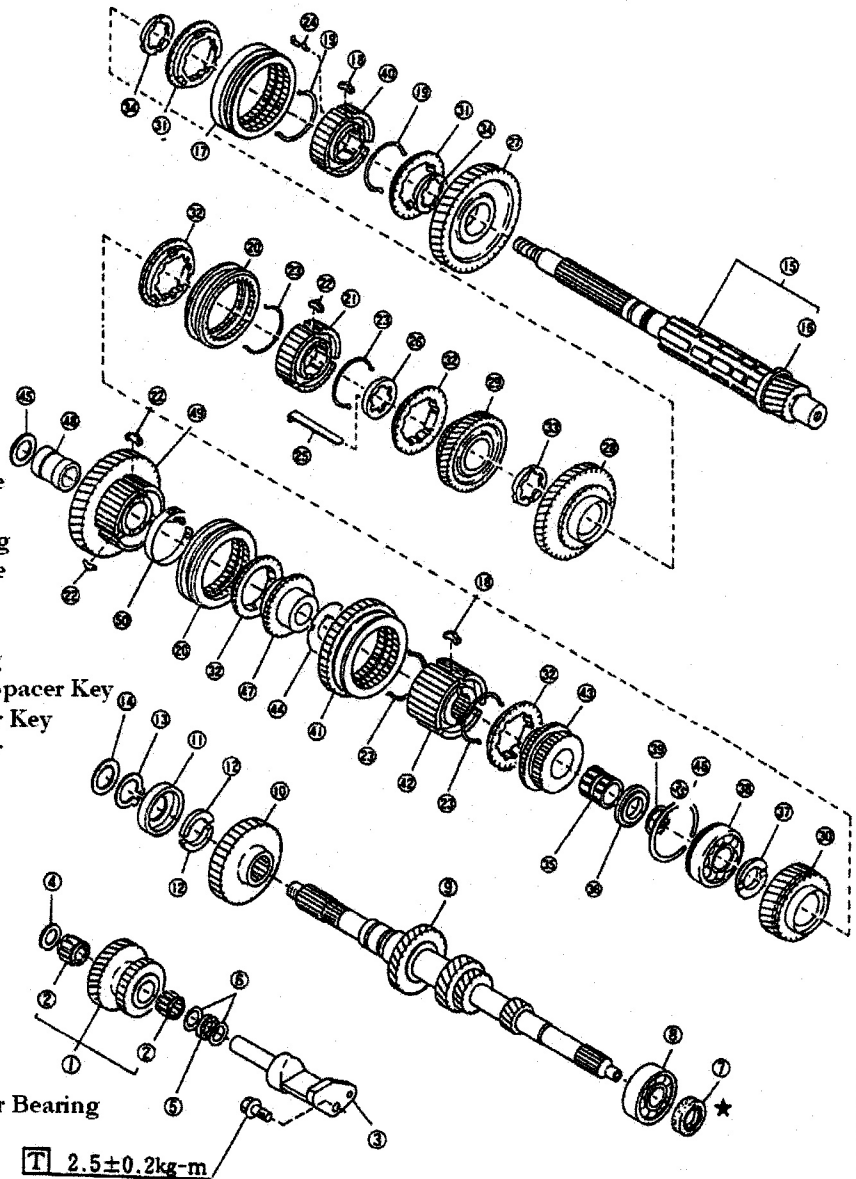
1. Transmission Cover CP
2. Reverse Check Cam
3. Reverse Check Spring
4. Air Breather Tube
5. Clip
6. 1~2 Gear Shifter Fork
7. 1~2 Shifter Rod
8. Spring Pin
9. 3~4 Shifter Fork
10. 3~4 Shifter Rod
11. 5th Release Shifter Rod
12. 5th Release Shifter Cam
13. EL Shifter Fork
14. Neutral Set Spring
15. 5th Reverse Shifter Fork
16. Spring Retainer
17. Spring Ring
18. Shifter Shaft
19. Shifter Arm
20. Inter Lock Plate
21. Check Spring
22. Reverse Return Spring Retainer
23. Reverse Return Spring
24. Check Ball
25. Snap Ring
26. O Ring
27. Washer
28. Needle Set Spring Retainer
29. Washer
30. Selector Shaft
31. Selector Lever
32. Shifter Lever
33. Aluminum Gasket
34. Check Ball Plug
35. Check Ball Spring
36. Interlock Bolt
37. Bracket
38. Washer
39. Washer



## TW 60 Series Selective 4WD

### Drive Pinion - Main Shaft - Reverse Idler Shaft

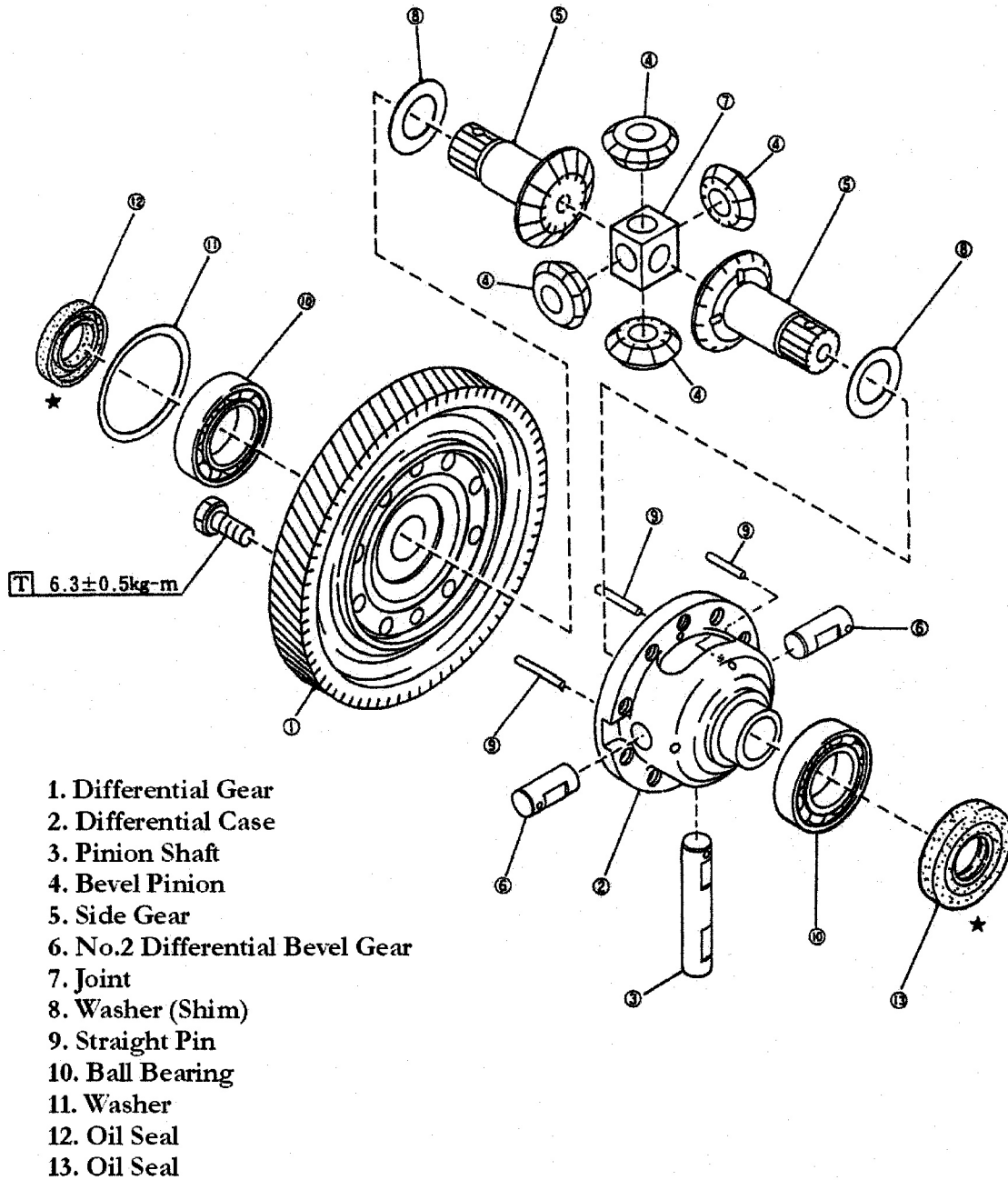
1. Reverse Idle Gear
2. Roller Bearing
3. Reverse Idle Shaft
4. Thrust Washer
5. Needle Bearing
6. Washer
7. Oil Seal
8. Ball Bearing
9. Main Shaft
10. 5th Drive Gear
11. Retainer
12. Cotter
13. Snap Ring
14. Washer
15. Drive Pinion Shaft
16. Washer
17. Synchronizer Sleeve
18. Shifting Inside
19. Synchronizer Spring
20. Synchronizer Sleeve
21. Synchronizer Hub
22. Shifting Inside
23. Synchronizer Spring
24. No.2 Gear Thrust Spacer Key
25. Gear Thrust Spacer Key
26. Gear Thrust Spacer
27. 1st Drive Gear
28. 2nd Drive Gear
29. 3rd Drive Gear
30. 4th Drive Gear
31. Synchronizer Ring
32. Synchronizer Ring
33. No.3 Gear Spacer
34. No.3 Gear Spacer
35. Bushing
36. Thrust Plate
37. Thrust Washer
38. Drive Pinion Center Bearing
39. Snap Ring
40. Synchronizer Hub
41. Reverse Drive Gear & Spring
42. Synchronizer Hub
43. 5th Driven Gear
44. Inside Stopper Plate
45. Washer
46. Snap Ring



47. EL Synchronizer Coupling
48. Bushing
49. EL Driven Gear & Hub
50. Synchronizer Spring

## TW 60 Series Select 4WD

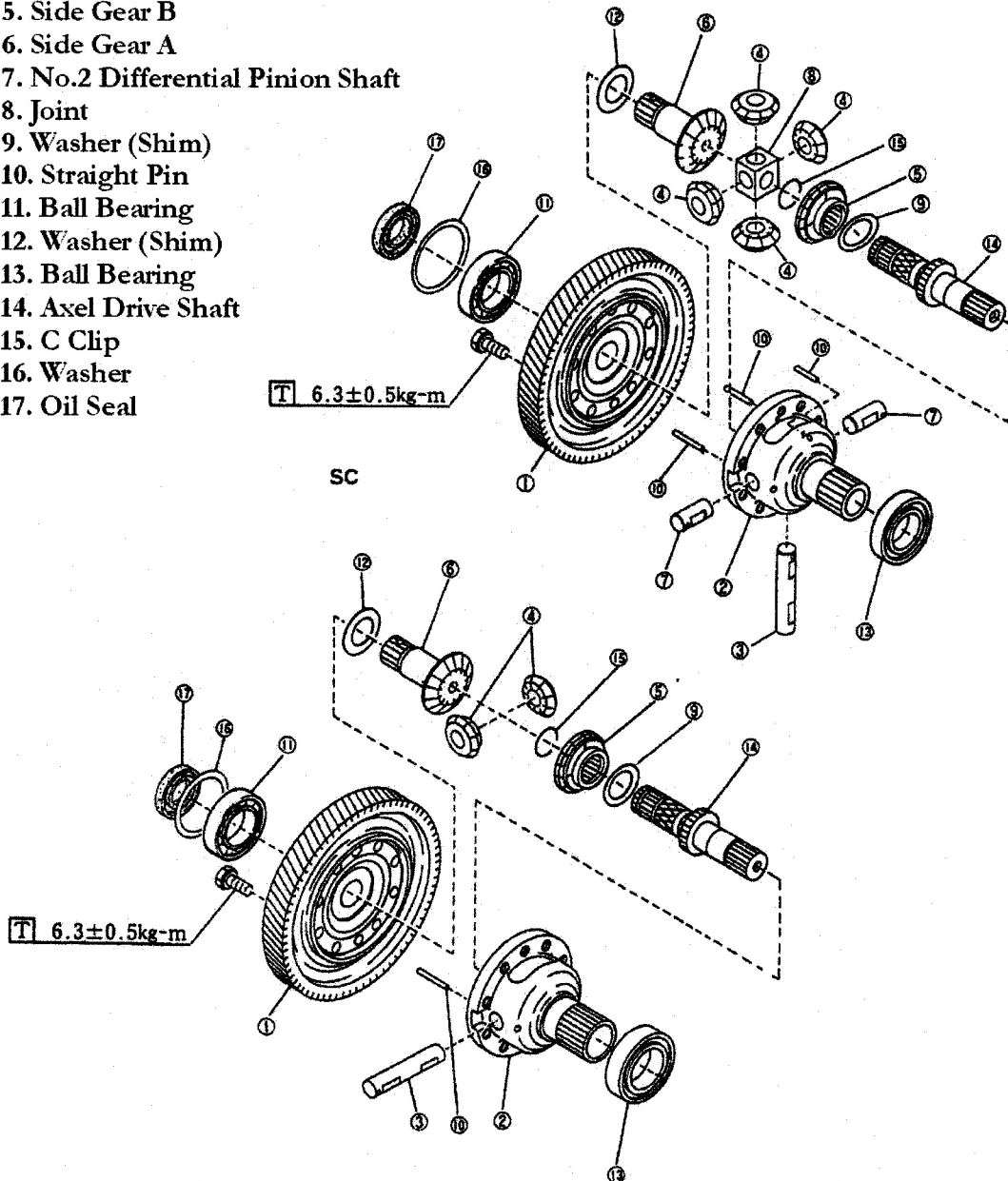
### Differential



## TW 60 Series Select 4WD

### Diff- Lock Differential

1. Drive Gear
2. Differential Case
3. Pinion Shaft
4. Bevel Pinion
5. Side Gear B
6. Side Gear A
7. No.2 Differential Pinion Shaft
8. Joint
9. Washer (Shim)
10. Straight Pin
11. Ball Bearing
12. Washer (Shim)
13. Ball Bearing
14. Axle Drive Shaft
15. C Clip
16. Washer
17. Oil Seal

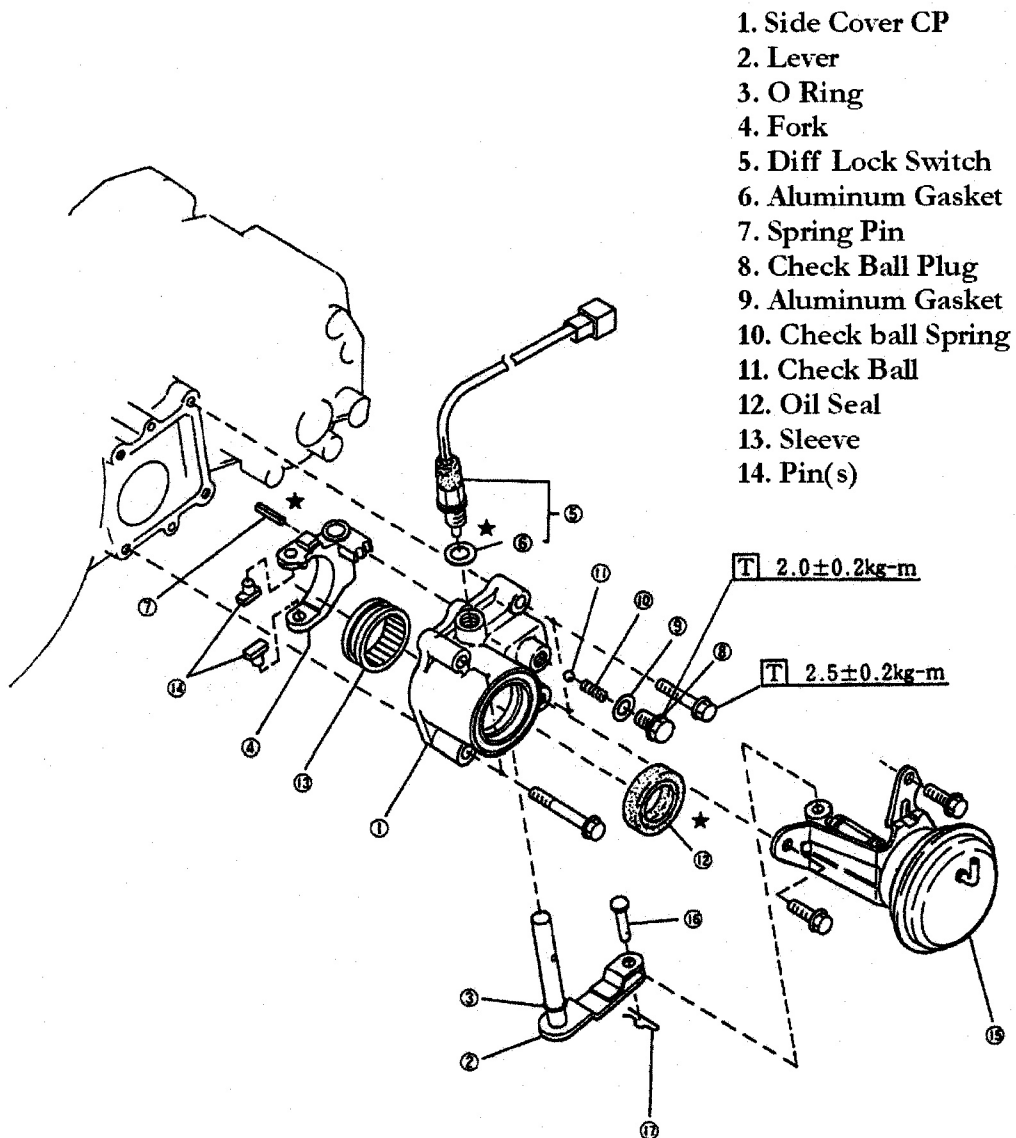


## TW 60 Selective 4WD

Differential Side Cover

Diff-Lock Vehicle

Diff-Lock Option Vehicle



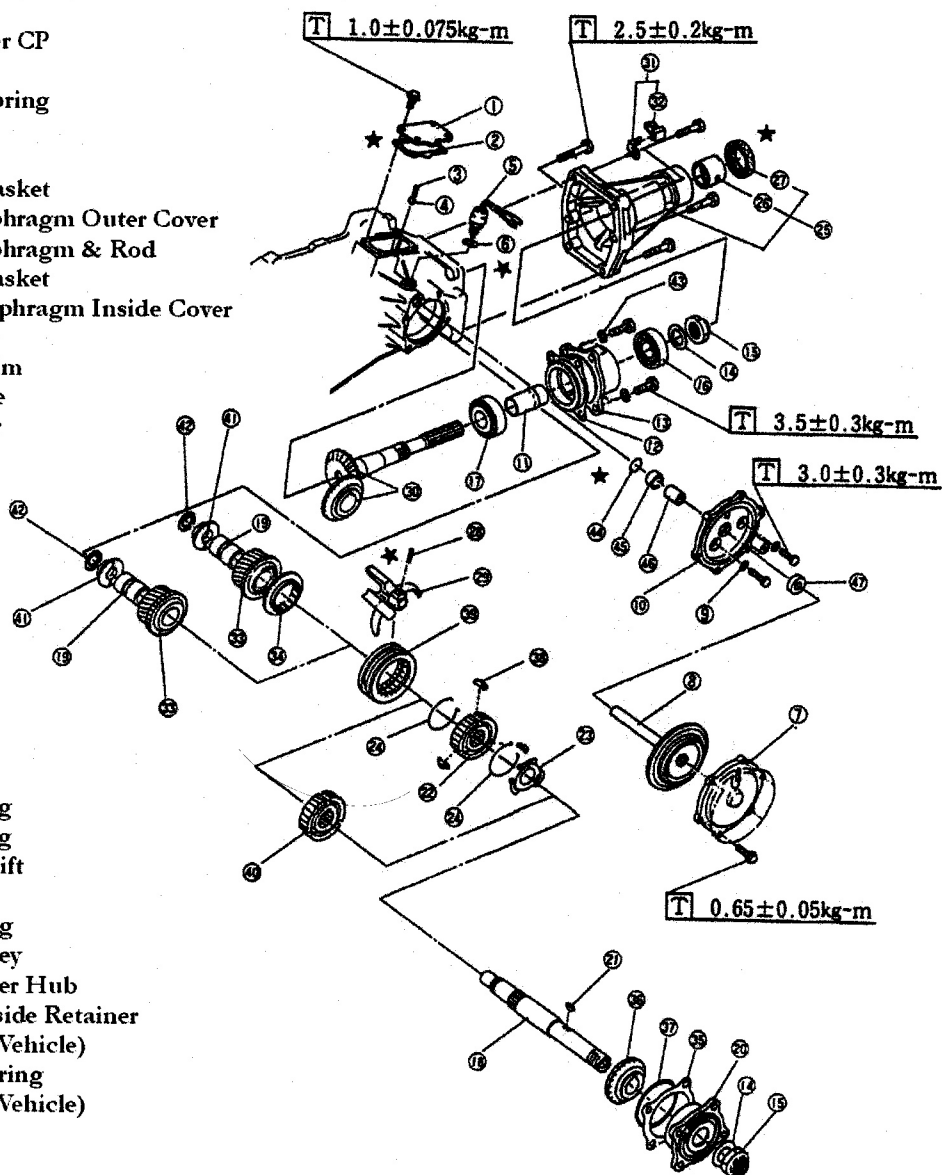
15. Diff-Lock Actuator  
 16. Pin  
 17. Snap Pin



## TW 60 Selective 4WD

### Transfer Extension

1. Transfer Cover CP
2. Gasket
3. Check Ball Spring
4. Check Ball
5. 4WD Switch
6. Aluminum Gasket
7. Transfer Diaphragm Outer Cover
8. Transfer Diaphragm & Rod
9. Aluminum Gasket
10. Transfer Diaphragm Inside Cover
11. Clasp Spacer
12. Backlash Shim
13. Bearing Case
14. Lock Washer



15. Lock Nut
16. Ball Bearing
17. Ball Bearing
18. Transfer Shift
19. Bushing
20. Ball Bearing
21. Woodruff Key
22. Synchronizer Hub
23. Shifting Inside Retainer  
(Free Axle Vehicle)
24. Synchro Spring  
(Free Axle Vehicle)
25. Extension
26. Bushing
27. Oil Seal
28. Spring Pin
29. Transfer Shifter Fork
30. Drive Bevel Gear
31. Stay (Free Axle Vehicle)
32. Support (Free Axle)
33. Transfer Driven Gear
34. Synchro Ring

35. Backlash Shim
36. Transfer Bevel Gear
37. O Ring
38. Shifting Inside (Free Axle)
39. Synchro Sleeve
40. Transfer Synchro Hub
41. Washer
42. Snap Ring

43. Washer
44. O Ring
45. Oil Seal
46. Transfer Side Cover Pin
47. Oil Seal

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## Clutch System Specifications

### Clutch Pressure Plate & Disk

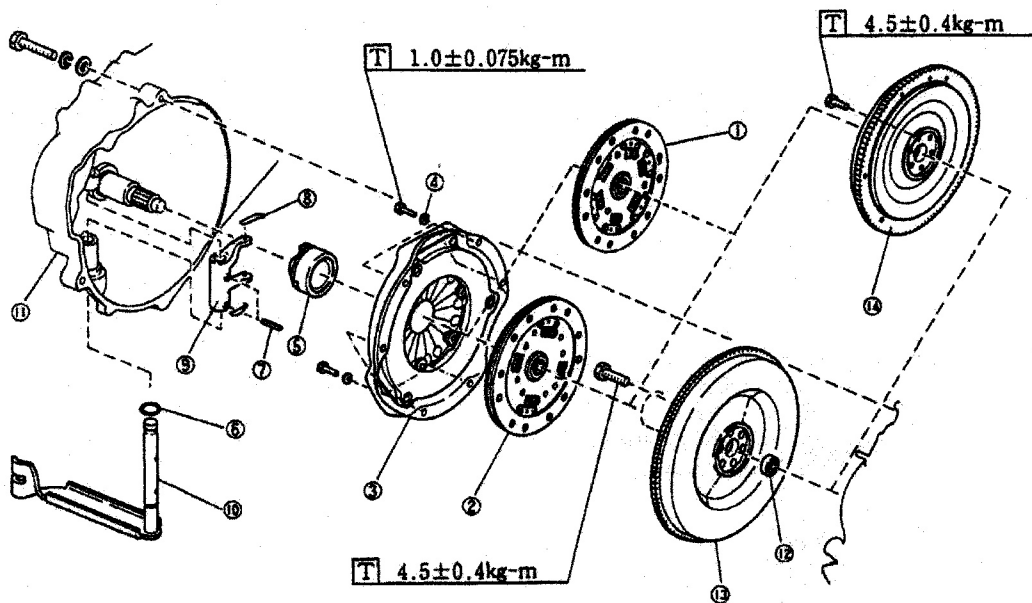
Specifications Chart

| Engine Type               |                   | EN07         |             |            |         |           |
|---------------------------|-------------------|--------------|-------------|------------|---------|-----------|
| Transmission              |                   | 2WD          | SC          | Select 4WD | SC      | Free Axel |
|                           |                   | TM60         | ←           | TW60       | ←       | TY60      |
| Clutch                    | Type              | Single Disk  | ←           | ←          | ←       | ←         |
|                           | Control           | Mechanical   | ←           | ←          | ←       | ←         |
| Clutch Pedal              | Type              | Suspended    | ←           | ←          | ←       | ←         |
|                           | Pedal Ratio       | 4.5          | ←           | ←          | ←       | ←         |
|                           | Stroke (mm)       | 115~120      | 130~135     | 115~120    | 130~135 | ←         |
| Pressure Plate<br>(Cover) | Type              | Push         | ←           | ←          | ←       | ←         |
|                           | Engage Load Kg    | 190          | 210         | 170        | 210     | ←         |
| Clutch<br>Disk            | Dimensions        | 160×125×3.5  | 180×125×3.5 | ←          | ←       | ←         |
|                           | Contact Area(cm2) | 106          | 131         | ←          | ←       | ←         |
|                           | Spline Teeth      | 23           | ←           | ←          | ←       | ←         |
|                           | Plate Thickness   | 8.35±0.4mm   | ←           | ←          | ←       | ←         |
|                           | Material          | Non-Asbestos | ←           | ←          | ←       | ←         |

## Clutch System

Clutch System Diagram

- |                                 |                                   |
|---------------------------------|-----------------------------------|
| 1. Clutch Disk (2WD NA Vehicle) | 8. Spring                         |
| 2. Clutch Disk (All Others)     | 9. Release Fork                   |
| 3. Clutch Cover                 | 10. Release Lever                 |
| 4. Spring Washer                | 11. Clutch Housing                |
| 5. Release Bearing              | 12. Pilot Bearing                 |
| 6. O Ring                       | 13. Flywheel (4WD SC Vehicle)     |
| 7. Straight Pin                 | 14. Flywheel (4WD and All Others) |

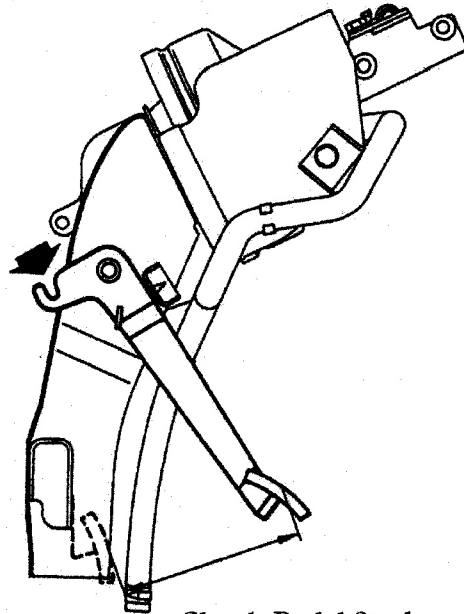


## Transmission

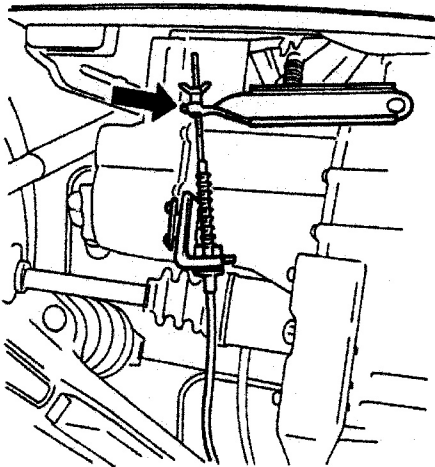
### Clutch Cable

#### Removal

1. From the Transmission side, loosen Wing Nut
2. Remove Outer End Joint Clip Behind Clutch Pedal. Remove Cables from Pedal Bracket.
3. Remove Clutch Pedal Joint
4. Remove Front Under Cover and Remove Cable Retaining Clip from Under The Steering Gear Box
5. Remove Other Retaining Clips Along Cable Path (If Equiped).
6. Remove Transmission Cable Attachment Bracket
7. Remove Return Spring and Clutch Cable From Release Lever
8. Remove Grommet from Cab Floor. Pull Out Cable.



Clutch Pedal Stroke



Clutch Cable Attachment Point

## Transmission

### Release Bearing & Release Fork

Note: Transmission Removed

#### Removal

1. Remove the (2) Springs from The Release Fork
2. Use ST 3987917000 Straight Pin Remover to Pull Out Straight Pin
3. Remove Clutch Release Fork and Clutch Release Lever CP

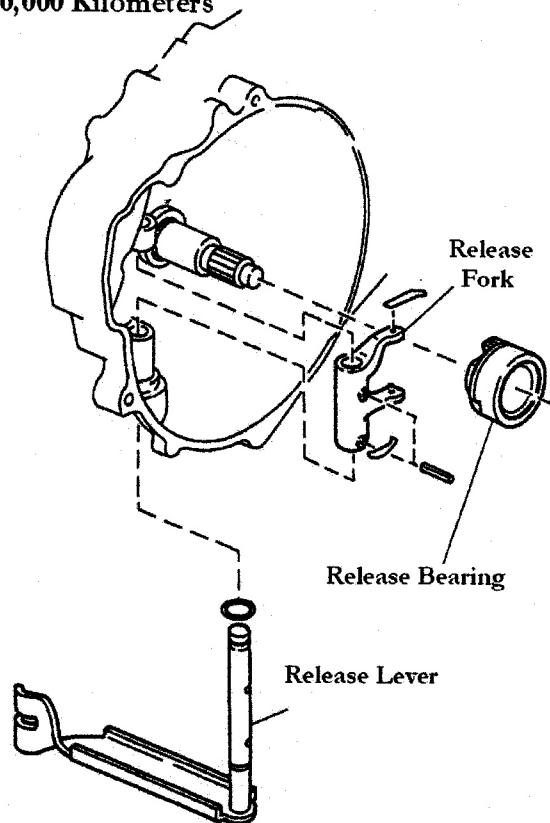
Caution: Bearing is Greasless Encapsulated Type. Do NOT Use Solvent to Clean

#### Bearing Inspection

Note: Bearing Shall Be Replaced Over 60,000 Kilometers

4. Inspect for Damage
5. Check for Rotation Smoothness

Note: Best Practice is to Change All Clutch Parts as a Set. Including Bearing-Disk-Pressure Plate



# Transmission

## Clutch Assembly

1. Use Clutch Disk Guide ST 499745400 To Prevent Disk Form Falling Out During Removal
2. Remove Clutch Cover Mounting Bolts From Flywheel
3. Install Flywheel Stop Tool
4. Remove Bolts and Remove Flywheel

ST 498275800 (Flywheel Stopper)

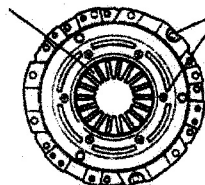
### Clutch Cover Inspection

Note: Be Careful Not To Spill Oil On Pressure Plate and Disk Surfaces

Note: Clutch Disk With Oil Saturation Must Be Discarded and Replaced

1. Inspect Backlash of Thrust Rivets (Slipage) and or Cracks. Missing Rivets Can Not Be Replaced. Unit Must be Discarded

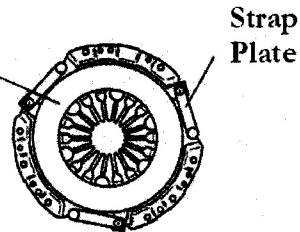
Diaphragm Plate



Thrust Rivets

2. Inspect for Galling, Pitting or Other Damage.

Pressure Plate



Strap Plate

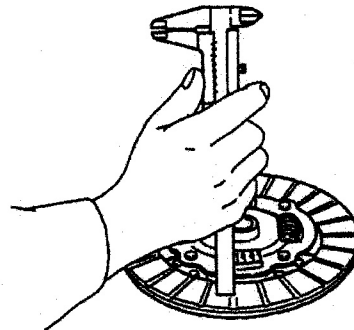
3. Inspect For Heat Damage or Warping

4. Check Stap Plates For Damage

### Clutch Disk Inspection

1. Check Surface for Visible Damage

|        |       |
|--------|-------|
| Normal | 1.4mm |
| Limit  | 0.3mm |



2. Measure Countersink Rivet to Disk Plate Surface (Specifications Above)

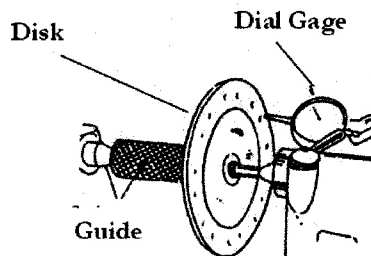
## Transmission

### Clutch Disk - Flywheel

#### 5. Clutch Disk Flutuation Limit

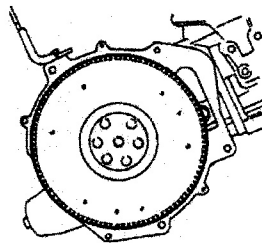
|       |       |
|-------|-------|
| Limit | 0.5mm |
|-------|-------|

|                   |                     |      |
|-------------------|---------------------|------|
| Measurement Point | TM60                | 150φ |
|                   | TM60<br>TW60 • TY60 | 170φ |



#### Flywheel Inspection

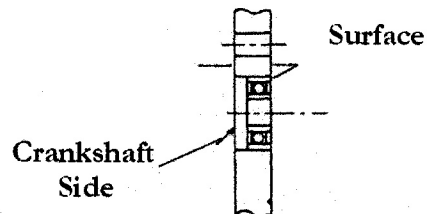
1. Inspect for Galling, Pitting, Heat Damage
2. Check Flywheel Teeth for Cracked or Missing Teeth



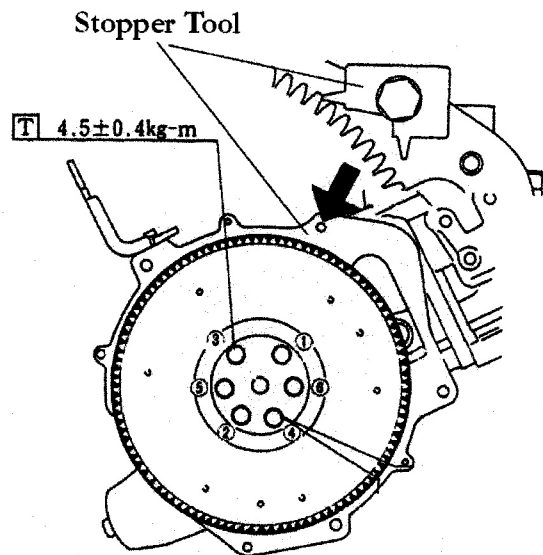
**Note: Missing or Damage Teeth Have New Ring Gear Welded and Re-Balance**

**Note: One Piece Flywheel Units Can Not Be Repaired**

#### Flywheel



#### 3. Attach Flywheel and Flywheel Stopper Set Torque



**Torque To Specifications**

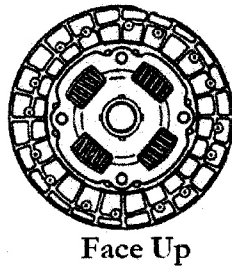
## Transmission

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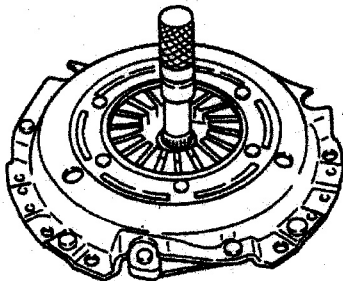
### Clutch Assembly

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1. Place Clutch Disk This Side Up



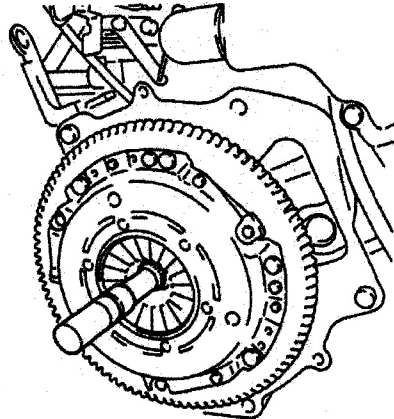
2. Place Pressure Plate Over The Top



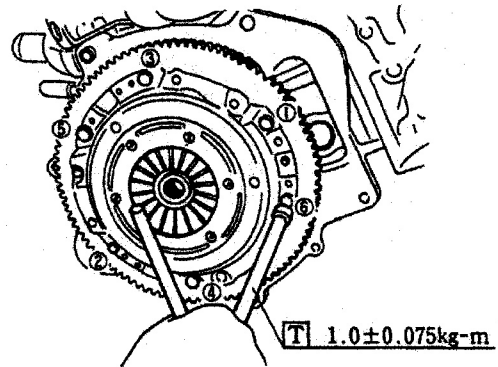
3. Use ST Tool 499745400 for NA Vehicles  
ST 4997455000 For SC 4WD Vehicles

Place The Tool Through The Pressure Plate

4. Install Disk and Plate



5. Torque Bolts to Specifications

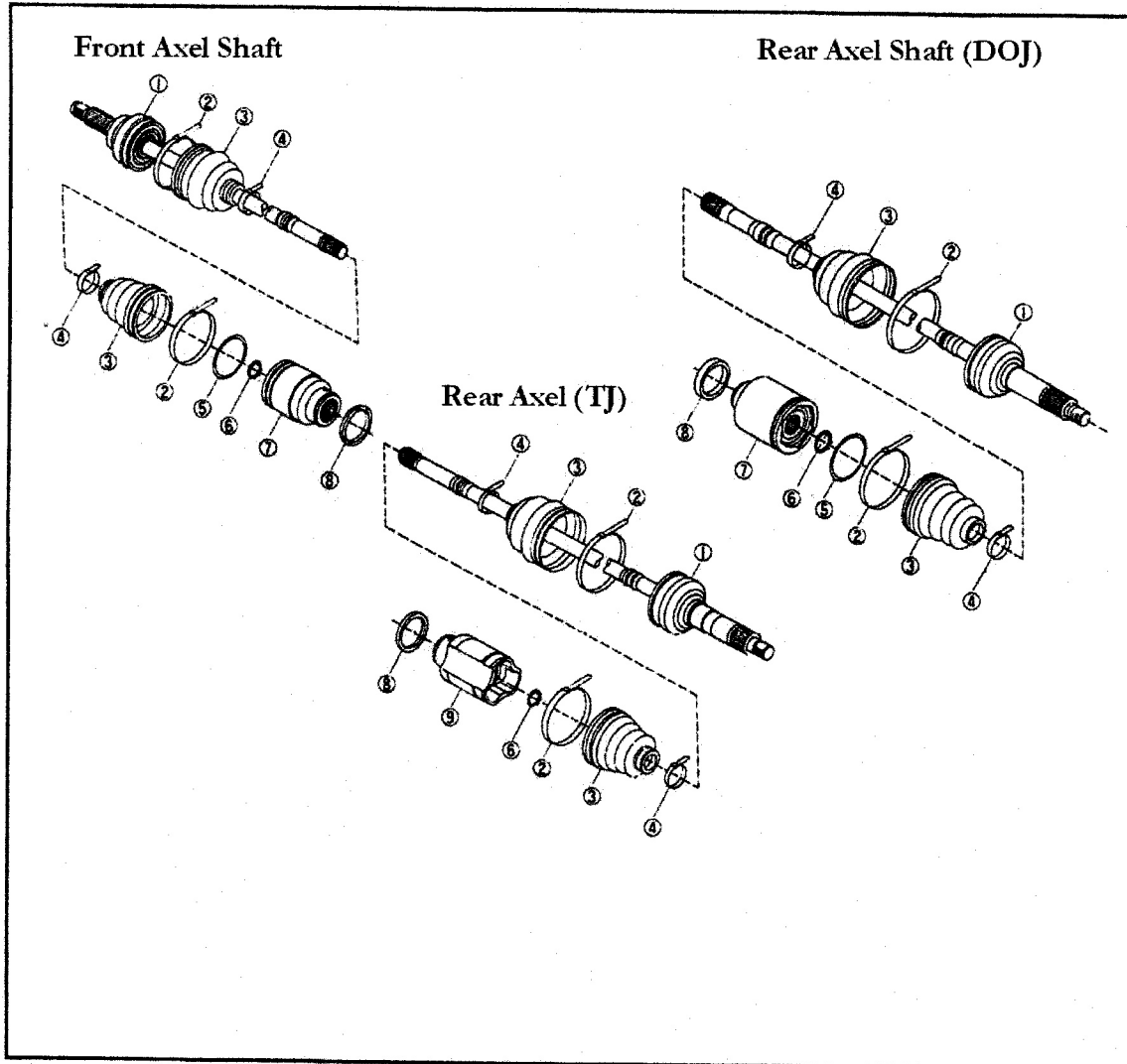


6. Remove Service Tool



## Drive Axel

### Axel Shaft System



1. BJ
2. Boot Band (Large)
3. Dust Boot
4. Boot Band (Small)
5. Circle Clip
6. Snap Ring
7. DOJ
8. Inner Oil Seal
9. TJ

## Drive Axel

### Drive Axel Types and Identification

