LOCKING HUBS

1986 Isuzu Trooper II

1986 Drive Axles
ISUZU LOCKING HUBS

P'UP, Trooper II

DESCRIPTION

Locking hubs engage and disengage front wheels from axle shafts on 4WD vehicles. When hubs are engaged or locked, wheels and axle shafts rotate together. When hubs are disengaged or unlocked, front wheels free wheel on hub bearings and axle shafts are not turned by wheels.

Engagement is accomplished through action of gears and springs within hub. When hub is locked, hub clutch engages inner hub, which is always connected to axle shaft by inner splines of hub. Hub clutch is always connected by outer splines to hub body. Control handle applies or releases spring tension to control hub clutch position.

Automatic hubs are engaged by rotational force of axle shaft when 4WD is selected at transfer case. Automatic hubs disengage when 2WD is selected and vehicle is driven in reverse. Cams, brakes and springs are used to lock or unlock automatic hubs.

IDENTIFICATION

Several different makes of hubs are used. Manufacturer's name is on control handle of manual hubs if marked. Automatic hubs have no handle on cover. Manual hubs have control handle marked with "LOCK" and "FREE" directions. Outer edge of hub cover on manual hubs is marked with "LOCK" and "FREE" positions.

REMOVAL & INSTALLATION

MANUAL HUBS

Removal

With control knob set to "FREE" position and transfer shift lever set in "2WD" or "NEUTRAL" position, remove cover-to-body bolts and cover assembly. Remove outer snap ring and shims (if equipped) from axle shaft. Remove hub body-to-hub bolts or nuts and cone washers (if equipped). Remove hub body and inner clutch from axle shaft.

Installation

Place new gasket on axle hub and install hub body with bolts or nuts and cone washers (if equipped). Tighten fasteners. Install snap ring, making sure snap ring fits groove on axle shaft. Apply grease to splines of inner hub. Set control handle and clutch in "FREE" position. Install new gasket and cover assembly and tighten bolts. Check control handle for smooth operation.

AUTOMATIC HUBS

Removal

Ensure hub is in "FREE" position and transfer case is in 2WD. Remove hub cover and gasket. Remove cover-to-hub body bolts on Isuzu models. Remove snap ring and shims from axle shaft. Unbolt hub body from axle hub and remove drive clutch and inner cam with hub

body.

Installation

1) Apply Loctite 515 to flange surface of driven clutch assembly. Install inner cam and drive clutch assembly on axle shaft and tighten bolts.

2) Ensure axle shaft end play is correct. Install snap ring with shim. Apply Loctite 515 to driven clutch flange surface. Install driven clutch flange and tighten bolts.

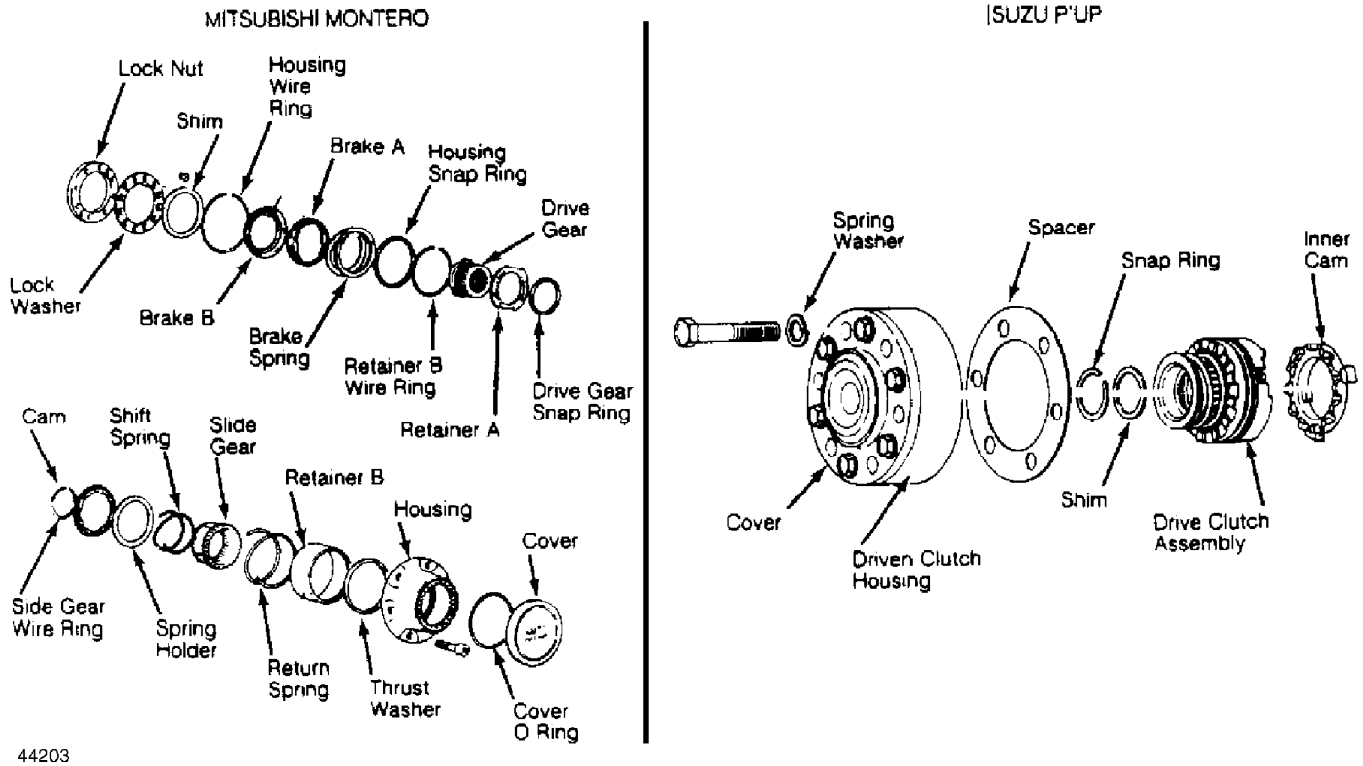

Fig. 1: Exploded View of Automatic Hubs
Courtesy of Isuzu Motor Co.

OVERHAUL

MANUAL HUB

Disassembly

Remove snap ring and control handle from hub cover. Remove detent ball and spring from control handle. Remove snap ring, inner hub and hub ring from body. Remove snap ring, hub ring and spacer from inner hub.

Inspection

Clean all hard parts in solvent. Inspect all parts for excessive wear or damage. Ensure control handle moves smoothly in cover. Check that clutch moves smoothly in hub body.

Reassembly

1) Apply grease to sliding surface of all parts. Install seal, detent ball and compression spring into control handle. Insert handle in cover and install snap ring. Install retaining spring in clutch with end of spring aligned with first groove cut in full width spline.

2) Install follower pawl on retaining spring with bent spring end hooked against one of large tabs on pawl. Top ring of retaining spring rides on small tabs. Place compression spring between clutch and cover with large end of spring against cover. Install clutch with pawl tab fitted to control handle.

3) Install spacer and hub ring on inner hub. Install snap ring. Insert inner hub and hub ring assembly in hub body. Install snap ring. Set control handle and clutch to "FREE" position. Install cover temporarily and ensure hub turns smoothly. Remove cover for installation procedure.

AUTOMATIC HUB

Disassembly

On Isuzu models, note that left and right clutch assemblies are marked with "L" or "R". Keep left and right side parts separated for reassembly.

Inspection

1) Measure inside diameter of housing. Standard (new) size is 2.403" (61.03 mm) and wear limit is 2.411" (61.23 mm). Inspect inner and outer flange for wear. Measure height of teeth on drive clutch and driven clutch. See Fig. 2. Standard height is .091" (2.30 mm) while wear limit is .079" (2.00 mm).

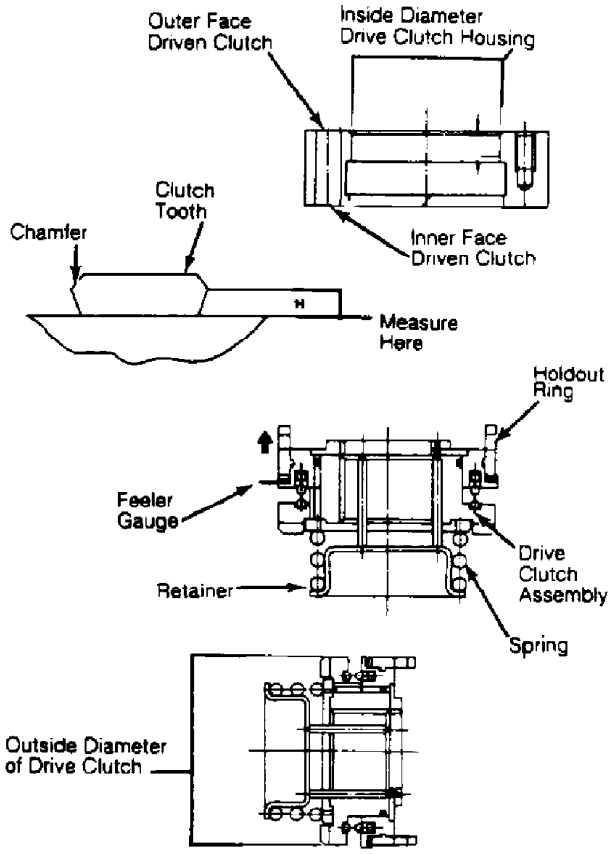

Fig. 2: Wear Point Measurements of Isuzu Automatic Hub
Courtesy of Isuzu Motor Co.

2) Measure axial play of hold-out ring on drive clutch assembly. Standard value is .012" (.30 mm) and wear limit is .016"

(.40 mm). Measure outside diameter of drive clutch assembly. Standard value is 2.39" (60.75 mm) and wear limit is 2.38" (60.45 mm).

Reassembly

1) Ensure transfer case is in 2WD position. Clean flange surface of hub, thread holes, lock washer and axle shaft splines. Install inner cam with key in groove of spindle. Tap cam lightly to ensure that it touches lock washer.

2) Hold inner cam and push stub axle of outer CV joint toward outside of wheel. Install Automatic Locking Hub Gauge (J-33935) on axle shaft so it touches lock washer. Measure clearance between outer face of gauge and outer edge of snap ring groove. See Fig. 3. Adjust clearance with shims to range of 0-.004" (0-.10 mm).

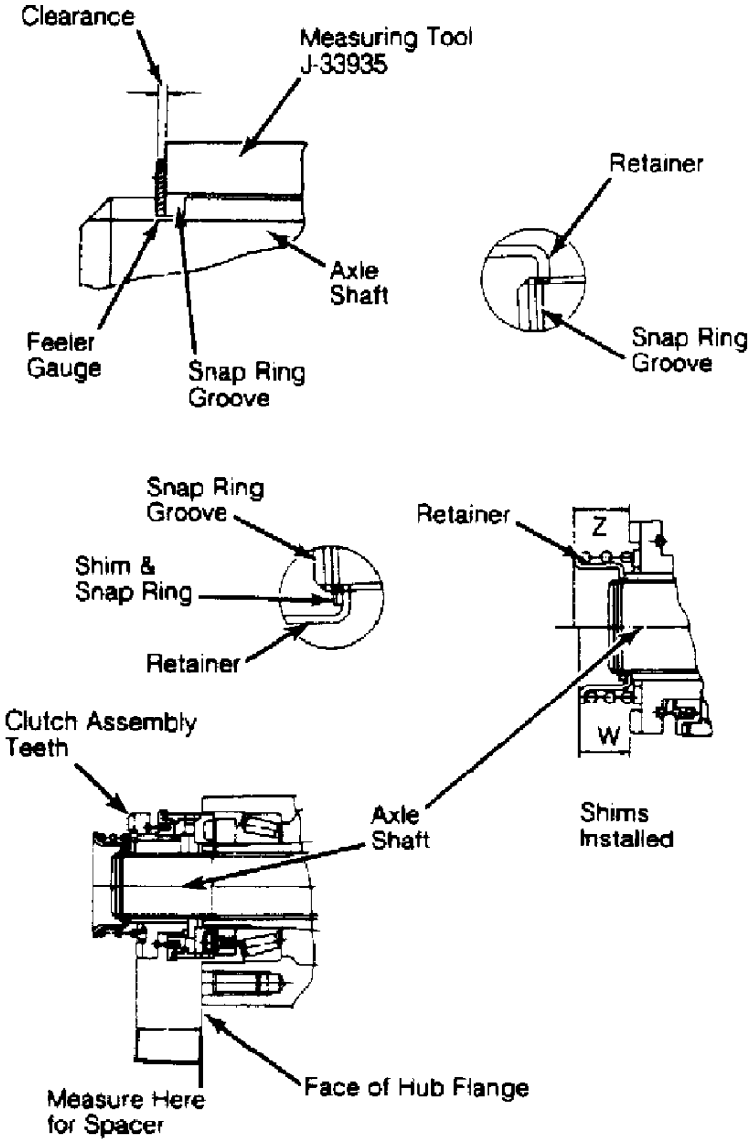

Fig. 3: Measuring Points For Isuzu Automatic Hub
Courtesy of Isuzu Motor Co.

3) Remove gauge, making sure inner cam remains in place. Install drive clutch assembly. Check that assembly marked "L" is on

left side and assembly marked "R" is on right side of vehicle. Lightly grease axle splines, inside of driven clutch, back and side grooves of drive clutch assembly.

4) Align cut portion of hold-out ring with convex part of drive clutch assembly. Align clutch assembly with inner cam and engage teeth of drive clutch with inner cam teeth. Measure distance from outer face of spring retainer on drive clutch assembly to outer face of teeth on drive clutch assembly. Record distance as "Z".

5) Using Snap Ring Installer (J-33934), install selected shims and install new snap ring. Ensure snap ring fits properly in groove of axle shaft. Measure distance from outer face of spring retainer to outer face of teeth on drive clutch assembly after installing snap ring and shims. Record distance as "W".

6) If "Z" - "W" is larger than .0028" (.7 mm), shim selection is correct. Measure distance from face of hub flange to outer face of clutch assembly teeth. See Fig. 3. For a distance of 1.00-1.04" (25.4-26.3 mm), no spacer is used. For a distance of 1.04-1.07" (26.3-27.2 mm), use 1 mm spacer. For a distance of 1.07-1.11" (27.3-28.1 mm), use 2 mm spacer.

7) Apply Loctite 515 to both sides of spacer and flange surface of driven clutch assembly. Install flange to driven clutch assembly. Tighten bolts. Apply Loctite 515 to flange surface of housing assembly. Install housing assembly with bolts and spring washers. Ensure housing assembly turns smoothly and tighten bolts.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Isuzu	
Hub Body-to-Hub Bolt	40.0-47.0 (54-64)
Cover-to-Hub Body Bolt	17.0-22.0 (23-30)