

# Front Suspension

## ISUZU P'UP & LUV PICKUPS

### DESCRIPTION

These trucks use independent type front suspension with torsion bars. Upper control arms are mounted to bracket which is part of shock tower. Lower control arm is mounted to crossmember.

Ball joints attach both upper and lower control arms to steering knuckles, which are part of the front wheel spindle. Torsion bars are connected in front to lower control arm and at rear to frame crossmember.

Back and forth movement of front suspension is regulated by a strut bar connecting lower control arm to frame, by means of a rubber bumper at frame end of strut. A stabilizer bar is attached to lower control arms and frame.

### ADJUSTMENT

#### WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

See *Wheel Alignment Specifications & Procedures* in *WHEEL ALIGNMENT* section.

#### WHEEL BEARING

1) Raise vehicle and support with safety stands. On 4 wheel drive (4-WD), place transfer shift lever in "2H" position and free wheeling hub in "FREE" position.

2) On 4-WD, remove hub cover, snap ring, and shims from end of spindle. Remove free wheeling hub body and lock washer.

3) On 2 wheel drive (2-WD), remove grease cap, cotter pin and nut retainer from spindle. Rotate wheel and tighten hub nut to 22 ft. lbs. (30 N.m), and until hub locks on 4-WD.

4) Turn hub 2 or 3 times to settle bearings. Loosen hub nut. Retighten nut finger tight and check that hub has no free play.

5) Attach a spring scale and measure starting force. Tighten spindle nut until a reading of 1.8-2.6 lbs. (8.0-11.6 N) is obtained. Make sure that the brake pads are not in contact with the rotor during this procedure.

6) On 2-WD, reassemble components in opposite order of removal. On 4-WD, install lock washer and free wheeling hub body and measure the clearance between free wheeling hub body and snap ring while pushing out on the axle shaft.

7) Select new spacer shims so that this clearance is less than .001" (.3 mm). Replacement shims are available in sizes .008, .01, .02 and .04" (0.2, 0.3, 0.5 and 1.0 mm). Install remaining components in reverse order of removal, to complete installation.

#### BALL JOINT CHECKING

Raised and support vehicle under lower control arm. Grasp wheel at top and bottom and try to shake wheel. If lower ball movement exceeds .06" (1.5 mm), replace lower ball joint. If there is any movement of upper ball joint replace upper ball joint and control arm as an assembly.

### REMOVAL & INSTALLATION

#### WHEEL BEARING

##### Removal (2-WD)

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove brake caliper

and support out of the way. Remove grease cap, cotter pin, hub nut retainer and hub nut.

2) Remove hub and rotor. Remove outer bearing, pry out inner grease seal and remove inner bearing. Drive out bearing races (if necessary).

##### Installation

To install, reverse removal procedures. Always use new races if replacing with new bearings. Always use new grease seals.

##### Removal (4-WD)

1) Raise vehicle and support with safety stands. Remove wheel assembly. With transfer case shift lever in "2H" position and free wheeling hub in "FREE" position, remove hub cover retaining bolts. Remove hub cover assembly.

2) Remove snap ring and shims from end of spindle. Remove free wheeling hub body from hub assembly. Remove brake caliper and support out of the way. Remove lock washer. Remove hub nut with wrench.

3) Remove hub and rotor. Remove outer bearing from hub. Drive out inner grease seal and retaining ring (inner bearing will be removed in this process). Drive out bearing races (if necessary).

##### Installation

To install, reverse removal procedures. Adjust wheel bearings.

#### UPPER CONTROL ARM & BALL JOINT

##### Removal

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove shock absorber dust cover. Remove upper ball joint cotter pin and nut.

2) Separate ball joint from steering knuckle and support the knuckle and brake caliper assembly out of the way. Note number and placement of shims at upper control arm bracket.

3) Remove bolts from upper pivot shaft. Remove shock absorber upper retaining nut, retainer and rubber grommet. Depress shock absorber. Remove control arm from bracket.

4) If replacing pivot shaft and bushings, remove bolts from each end of pivot shaft. Remove lock washer, flat washer and plate. Press out pivot shaft and bushing.

##### Inspection

Check control arm and pivot shaft for cracks or distortion. Replace both pivot shaft and bushings (if either is defective). Replace ball joint and control arm as an assembly (if either is defective).

##### Installation

1) If pivot shaft and bushings have been removed, install pivot shaft and bushings on control arm using installer tool (J-29755). Install bolt with plate, washer and lock washer on each side of pivot shaft and tighten.

2) Install ball joint stud through knuckle. Install castle nut. Tighten to specifications, plus just enough more to install cotter pin. Mount control arm to chassis and install shims in equal thickness to those removed during disassembly.

3) Tighten bolt at thin shim pack first and bolt at thicker shim pack last. Install upper shock absorber nut. Install shock absorber dust cover and wheel assembly. Lower vehicle to floor.

## ISUZU P'UP & LUV (Cont.)

### LOWER CONTROL ARM & BALL JOINT

#### Removal

1) Raise vehicle and support with safety stands. Remove wheel assembly. Remove strut bar, torsion bar and stabilizer bar.

2) Detach lower end of shock absorber. Remove ball joint-to-control arm retaining bolts and separate ball joint from control arm. Remove control arm retaining nuts and bolts. Remove control arm from vehicle.

#### Ball Joint Replacement (2-WD)

Remove cotter pin and ball joint stud nut. Separate ball joint from knuckle. Remove bolts attaching ball joint to control arm (if still installed) and remove ball joint.

#### Ball Joint Replacement (4-WD)

1) Follow Control Arm Removal procedures through separation of ball joint from control arm. Remove tie rod ends from knuckle. Remove cotter pin and ball joint stud nut.

2) Separate ball joint from steering knuckle. Remove hub and knuckle assembly from axle shaft and support out of the way. Remove ball joint.

#### Inspection

Check all parts for distortion, cracking or excessive wear. Replace all worn part.

#### Installation

To install, reverse removal procedures. Ball joint must be attached to control arm before control arm is installed.

### SHOCK ABSORBER

#### Removal

1) Raise vehicle and support with safety stands. Remove shock absorber dust cover. Hold shock absorber upper shaft with a wrench and remove retaining nut.

2) Remove retainer and rubber grommet. Remove shock absorber lower bolt from lower control arm and remove shock absorber.

#### Installation

1) Check shock absorber and replace (if necessary). Fully extend shock absorber, place lower retainer and grommet on shaft and slide shock absorber into position.

2) Install upper grommet and retainer on shaft and tighten nut. Slide bolt through lower shock absorber mount and shock absorber. Install shock absorber dust cover, tighten mounting bolt and lower vehicle.

### STABILIZER BAR

#### Removal

1) Raise vehicle and support with safety stands. Disconnect stabilizer bar from lower control arm. Remove brackets holding bar to frame and remove bar.

2) Remove link bolt, spacers and rubber grommets from lower control arm or stabilizer bar. Inspect all parts for wear or damage and replace (if necessary).

#### Installation

Bolt brackets to frame over rubber bushings installed over stabilizer bar but do not tighten. Connect link bolts to lower control arm. Connect link bolts to stabilizer. Tighten stabilizer and bracket bolts to specifications.

### TORSION BAR

#### Removal

1) Raise vehicle and place safety stands under front of vehicle. Remove stopper plate 2-WD only, and height control arm adjusting bolt.

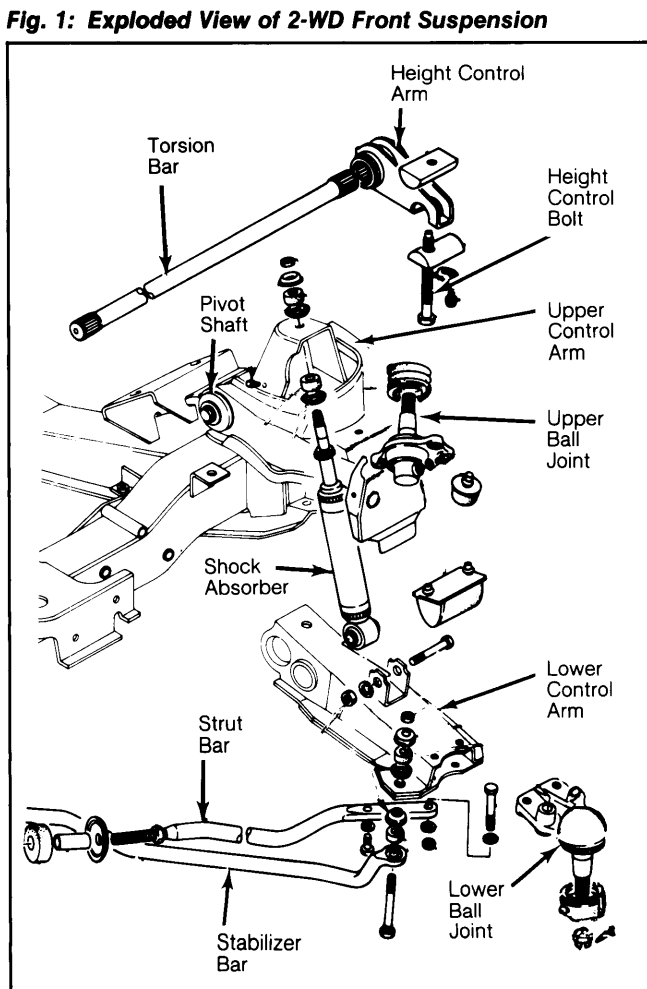
2) Mark position and remove height control arm from torsion bar and third crossmember 2-WD, or torsion bar and bracket 4-WD. Mark position and remove torsion bar from control arm.

#### Installation

1) Thoroughly grease serrated portions at both ends of torsion bar. Raise lower control arm with floor jack to position rubber bumpers in contact with lower control arm. Install front end of torsion bar into control arm.

2) Install height control arm into position so its end reaches height control bolt (grease portion of height control arm which fits into frame).

3) Turn height control adjusting bolt to position marked during removal. Check riding height. See *Riding Height* article in **WHEEL ALIGNMENT** section. Install stopper plate.



Front suspension of 4-WD is similar.

# Front Suspension

## ISUZU P'UP & LUV (Cont.)

### LOWER CONTROL ARM STRUT BAR

#### Removal

1) Correct caster angle can be maintained by marking positions of strut rod nuts for reassembly reference. Raise vehicle and support with safety stands.

2) Remove nuts, washers and rubber bushings from front side of strut bar. Remove bolts holding strut bar to lower control arm and remove strut bar.

#### Installation

1) Place washer and bushing on strut bar and slide rod through frame bracket. Place second set of washers and bushings on end through bracket. Start one washer and one nut, but do not tighten.

2) Bolt other end of strut to lower control arm and tighten to specifications. Lower vehicle and tighten bracket nut, install second nut and tighten to specifications.

### STEERING KNUCKLE

#### Removal

1) Raise vehicle and support with safety stands. Remove brake caliper assembly without disconnecting line and support out of the way.

2) Remove hub and rotor assembly as previously outlined. Remove retaining bolts around spindle. Remove tie rod link, dust shield and adapter.

3) Remove cotter pins and castle nuts from upper and lower ball joints and separate ball joints from knuckle. Remove knuckle.

#### Installation

To install, reverse removal procedures. Adjust wheel bearings.

### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Stabilizer Bar-to-Bracket .....	55 (75)
Stabilizer Bar-to-Lower Control Arm .....	7 (10)
Strut Bar-to-Lower Control Arm .....	45 (61)
Strut Bar-to-Frame .....	66 (90)
Upper Control Arm Pivot Shaft Bushings .....	87 (118)
Upper Control Arm Pivot Shaft-to-Frame .....	75 (102)
Lower Control Arm-to-Crossmember	
2-WD .....	90 (122)
Lower Control Arm-to-Frame Bracket	
4-WD .....	97 (132)
Ball Joint-to-Lower Control Arm .....	30 (41)
Ball Joint Stud Nuts .....	75 (102)
Shock Absorber (Upper) .....	14 (19)
Shock Absorber (Lower) .....	45 (61)
Rotor-to-Hub .....	36 (49)