SUSPENSION - FRONT

1998 Mitsubishi Montero

1997-98 SUSPENSION
Mitsubishi - Front - 4WD & RWD

Montero, Montero Sport

DESCRIPTION

Independent front suspension uses double wishbone construction with torsion bar. Components used with this system include upper control arm, lower control arm, shock absorber, stabilizer bar and steering knuckle. See Fig. 1.

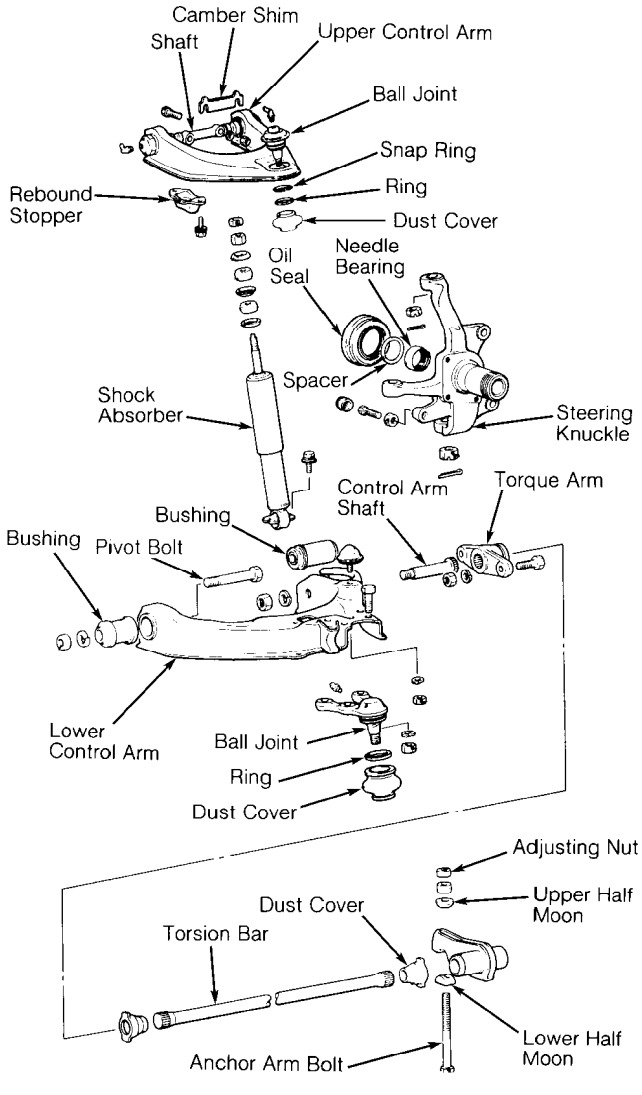

Fig. 1: Exploded View Of 4WD Front Suspension (Montero Shown, Montero Sport Similar)
Courtesy of Mitsubishi Motor Sales of America.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT section.

WHEEL BEARING

Preload

1) Using Socket (MB990954) and torque wrench, tighten axle lock nut to 119 ft. lbs. (162 N.m) on Montero, 94-145 ft. lbs. (127-196 N.m) on Montero Sport. Loosen nut to 0 ft. lbs. (0 N.m). Retighten nut to 18 ft. lbs. (25 N.m).

2) Loosen nut 30-40 degrees on Montero, 30 degrees on Montero Sport. Install lock washer. If lock washer hole is not aligned with lock nut hole, lock nut may be rotated up to 20 degrees to obtain alignment. After setting preload, check hub turning resistance and axial play (4WD only).

Hub Turning Resistance & Axial Play (4WD Only)

1) Using dial indicator, check front hub axial play. Axial play should be 0.002" (0.05 mm) or less. Using INCH-lb. torque wrench or spring scale attached to wheel stud, measure hub turning resistance. Turning resistance should be 1.1-4.0 lbs. (5-18 N) on Montero or 0.9-4.3 lbs. (4-19 N) on Montero Sport if measured using spring scale, or 2.6-11.3 INCH lbs. (0.3-1.3 N.m) on both models if measured using torque wrench.

2) Adjust wheel bearing so turning resistance and axial play are within specification. If turning resistance and axial play cannot be adjusted to specification, check wheel bearing condition and installation.

Drive Axle End Play (4WD Only)

Install drive axle shim and snap ring. Push drive shaft in toward knuckle. Measure clearance between drive flange and shim with a feeler gauge. If clearance is not 0.016-0.028" (0.4-0.7 mm) replace shim to bring clearance into specification.

BALL JOINT CHECKING

Lower Ball Joint

Place ball joint in soft-jawed vise. Install dial indicator with stem resting on end of ball joint stud. Measure ball joint stud end play. Replace ball joint if end play exceeds 0.012" (0.3 mm). For ball joint replacement, see LOWER BALL JOINT under REMOVAL & INSTALLATION.

Upper Ball Joint

1) Disconnect ball joint from steering knuckle. Place nut on ball joint stud. Using INCH-lb. torque wrench, measure starting torque required to rotate ball joint stud.

2) Starting torque should be 7-30 INCH lbs. (0.8-3.5 N.m). Replace ball joint if starting torque is not within specification. For ball joint replacement, see UPPER BALL JOINT under REMOVAL & INSTALLATION.

REMOVAL & INSTALLATION

AXLE HUB ASSEMBLY

Removal

Raise and support vehicle. Remove wheel assembly. Remove hub cap. Remove snap ring and shim. Remove drive flange. Remove brake caliper and suspend with wire. On vehicles with ABS, remove ABS speed sensor. On all models, remove lock washer. Remove lock nut using Socket (MB990954). See Fig. 2. Remove front rotor and hub assembly.

Installation

To install, reverse removal procedure. Adjust wheel bearing preload and check drive shaft endplay. See ADJUSTMENTS.

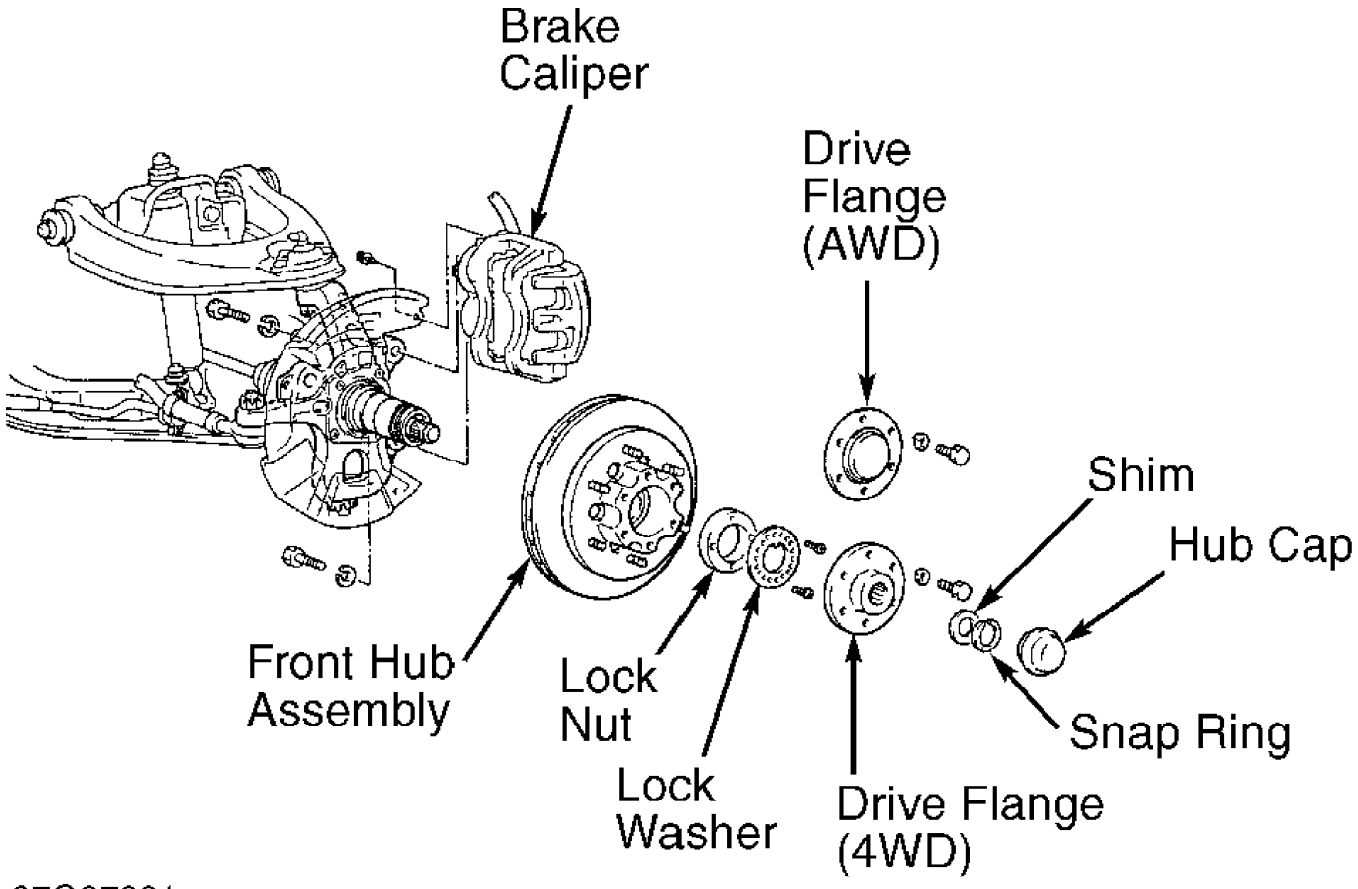

Fig. 2: Exploded View Of Hub Assembly (Montero Sport Shown, Montero Similar)
Courtesy of Mitsubishi Motor Sales of America.

STEERING KNUCKLE

Removal

1) Raise and support vehicle. Remove wheel assembly. Remove brake caliper. Remove axle hub assembly. See AXLE HUB ASSEMBLY under REMOVAL & INSTALLATION. Remove brake dust cover from steering knuckle. If equipped with ABS, remove ABS speed sensor.

2) On all models, disconnect tie rod end from steering knuckle. Mark torsion bar adjusting nut for installation reference. Loosen torsion bar anchor arm assembly adjusting nut. Loosen, but DO NOT remove, ball joint-to-steering knuckle nuts.

3) Using Steering Linkage Puller (MB991406), separate ball joints from steering knuckle. Detach upper and lower ball joints from steering knuckle. Remove steering knuckle from axle shaft. Remove oil

seal and spacer from steering knuckle.

Inspection

Inspect steering knuckle for cracks. Inspect spindle for wear and heat damage.

Installation

1) If needle bearing needs replacement, drive bearing from steering knuckle. Use Bearing Driver (MB990956-01) and Handle (MB9909938-01) to install NEW needle bearing until it is even with steering knuckle end face.

NOTE: DO NOT reuse steering knuckle needle bearing if it is removed.

2) Lubricate bearing roller surface and spacer-to-steering knuckle contact areas. Install spacer with chamfered side toward inside of vehicle. Using Seal Installer (MB990985-01) and handle, install seal in steering knuckle until seal is even with steering knuckle end face. Apply grease to seal lip area and inside of seal. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

LOWER BALL JOINT

Removal

1) Raise and support vehicle. Remove skid plate (if equipped). Remove wheel assembly. Mark torsion bar adjusting nut for reassembly reference. Release torsion bar tension.

2) Loosen, but DO NOT remove, lower ball joint stud nut. Using Steering Linkage Puller (MB991406), separate ball joint from steering knuckle. Remove ball joint stud nut. Remove ball joint-to-lower control arm bolts. Remove ball joint.

Installation

Lubricate ball joint. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

LOWER CONTROL ARM

Removal

1) Raise and support vehicle. Remove wheel assembly. Remove front skid plate and undercover (if equipped). Remove bump stop and bump stop bracket. Remove heat shield (if equipped). Remove torsion bar. See TORSION BAR. Loosen, but DO NOT remove, lower ball joint-to-steering knuckle nut. Using Steering Linkage Puller (MB991406), separate lower ball joint from steering knuckle. Support with cord tied to nearby part.

2) Remove stabilizer bar bolt from control arm. Remove shock absorber mounting bolts. Remove ball joint stud nut from steering knuckle. Remove control arm shaft. See Fig. 1. Remove torque arm. Remove bump stopper and lower control arm. Remove lower ball joint from lower control arm.

Inspection

1) Inspect control arm for cracks and deformation. Check ball joints. See BALL JOINT CHECKING under ADJUSTMENTS & INSPECTION.

2) Inspect ball joint dust covers for damage. Replace damaged dust covers. Inspect control arm bushing and frame bracket bushing for damage. Replace bushings if necessary.

NOTE: Differential carrier may require detachment in order to

replace left bracket bushing.

NOTE: Tighten lower control arm shaft and pivot bolt to specification with vehicle at normal operating height.

Installation

To install, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS. Tighten lower control arm shaft and pivot bolt to specification with vehicle at normal operating height.

STABILIZER BAR

Removal

Remove skid plate (if equipped). Disconnect stabilizer bar link bolt. Remove stabilizer bar clamp bolts. Remove stabilizer bar and bushings. On Montero Sport remove the stabilizer link brackets and bushings.

Installation

1) To install, reverse removal procedure. Note that slit in stabilizer bushing faces vehicle. Marks on bar should be approximately 0.39" (10 mm) from edge of bracket. On Montero Sport adjust the stabilizer link assembly mounting nut so there is 0.2-0.3" (6-8 mm) of threads exposed from the top of the nut to the top of the threads.

TORSION BAR

NOTE: Mark torsion bar and anchor arm location for reassembly reference before removing.

Removal

1) Raise and support vehicle. Support lower control arm using jack stand. Loosen anchor arm adjusting bolt lock nut. Remove heat protector from frame (right side only). Loosen anchor arm bolt to release torsion bar tension.

2) Mark front of torsion bar and torque arm for reassembly reference. Remove anchor arm. See Fig. 1. Remove dust covers from torsion bar. Remove heat cover (right side only) located between dust cover and torsion bar. Remove torsion bar.

Inspection

Inspect all splined areas for damage. Inspect dust covers for cracks and damage. Check for bent anchor arm bolts. Replace components as necessary.

Installation

1) Apply grease to splined areas of torsion bar, anchor arm, torque arm splines, anchor arm bolt threads and inside of dust cover. Check for left and right identification marks on torsion bar ends. Ensure torsion bars are installed in correct locations.

2) Install torsion bar in torque arm, with identification mark toward front of vehicle and the slit in the anchor collar facing downward. Align mark on torque arm with mating mark on torsion bar. When installing a new torsion bar, align White paint spline with index mark on front anchor arm.

3) Tighten anchor arm bolt adjusting nut to obtain correct final bolt protrusion. See FINAL ANCHOR ARM BOLT PROTRUSION table. Final bolt protrusion depends upon curb weight of vehicle. With vehicle unladen, measure distance from bump stopper bracket to bump stopper. Distance should be 0.83-0.91" (21-23 mm) on Montero, 0.7" (18 mm) on Montero Sport. If not, adjust anchor bolt nut.

FINAL ANCHOR ARM BOLT PROTRUSION

Application/ Model	Right Bolt In. (mm)	Left Bolt In. (mm)
Montero	3.15 (80.0)	3.15 (80.0)

4) To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS. Check riding height and front wheel alignment. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT section.

UPPER BALL JOINT

Removal

1) Raise and support vehicle. Remove wheel assembly. Mark torsion bar adjusting nut for reassembly reference. Release torsion bar tension. Loosen, but DO NOT remove, upper ball joint-to-steering knuckle nut.

2) Using Steering Linkage Puller (MB991406), separate ball joint from steering knuckle. Remove ball joint nut from steering knuckle. Remove ball joint-to-upper control arm bolts. Remove ball joint.

Installation

Lubricate ball joint. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

SHOCK ABSORBER & UPPER CONTROL ARM

Removal

1) Disconnect actuator on vehicles with Variable Shock Absorbers. On all models, raise and support vehicle. Support lower control arm using jackstand. Remove front wheels. Remove lower shock absorber bolt. Remove nut from top of shock absorber and remove shock assembly from vehicle.

2) Remove the bump stop from the bump stop bracket. Mark anchor arm bolt for reassembly reference. Loosen anchor arm bolt to release torsion bar tension. Disconnect and plug brake hose at frame mount bracket.

3) Remove cotter pin from upper ball joint stud. Loosen, but DO NOT remove, ball joint stud nut. Using Steering Linkage Puller (MB991406), loosen ball joint from steering knuckle. Remove brake hose clip and rebound stopper. Remove rebound stopper and brake hose support from control arm.

4) Remove ABS sensor bracket (if equipped) and rebound stoppers. Remove upper control arm mounting bolts and shim(s). Note direction of bolt installation and locations of camber adjustment shims. Remove control arm. Remove upper ball joint from control arm.

Inspection

Inspect control arm for cracks and deformation. Check ball joints. See BALL JOINT CHECKING under ADJUSTMENTS & INSPECTION. Inspect ball joint dust cover for damage, and replace cover as necessary.

Installation

1) To install, reverse removal procedure. Install control arm bolts from outside of frame, with nuts against control arm. Install the upper control with the marking "OUT" on shaft facing outside of vehicle.

2) Ensure alignment shims are placed in original locations. Tighten shock absorber upper nut to end of threads, and install lock nut. Tighten shock absorber upper nut until distance from end of threads to nut is 0.04-0.08" (1.0-2.0 mm) on vehicles with standard shock absorbers, and 0.06-0.10" (1.5-2.5 mm) on vehicles with Variable Shock Absorbers. Install lock nut.

3) Tighten bolts to specification. See TORQUE SPECIFICATIONS. Bleed brakes. Adjust anchor arm bolt to proper torsion bar setting. See TORSION BAR under REMOVAL & INSTALLATION. Check wheel alignment, and adjust it if necessary. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT section.

WHEEL BEARING

Removal

Raise and support vehicle. Remove wheel assembly. Remove axle hub. See AXLE HUB under REMOVAL & INSTALLATION. Clean any grease from the inside surface of the front hub. Drive out the inner and outer bearing races by tapping them uniformly using brass drift and hammer.

Installation

Lubricate bearing races. Install bearing races in hub using Handle and Bearing Installer (MB990938 and MB990935). Ensure bearing races are fully seated. To complete installation, reverse removal procedure. Adjust wheel bearing preload. See WHEEL BEARING under ADJUSTMENTS & INSPECTION.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS (MONTERO)

Application	Ft. Lbs. (N.m)
Anchor Arm Bolt Lock Nut	33 (44)
Anchor Collar Vertical Bolt	33 (44)
Ball Joint Nut	
Lower	108 (147)
Upper	54 (74)
Bump Stop	18 (25)
Drive Flange	36-43 (49-59)
Ball Joint-To-Lower Control Arm Bolt	60 (81)
Ball Joint-To-Upper Control Arm Bolt	19 (25)
Caliper Bolt	65 (88)
Control Arm-To-Frame Bolt/Nut	
Lower	108 (147)
Upper	80 (108)
Shock Absorber Shaft Nut	1 (15)
Skid Plate	17 (24)
Stabilizer Bar Brackets	17 (24)
Stabilizer Bar Lower Link	25 (33)
Stabilizer Bar Upper Link	69 (93)
Torque Arm Nut	78 (106)

TORQUE SPECIFICATIONS (MONTERO SPORT)

Application	Ft. Lbs. (N.m)
Anchor Arm Adjusting Nut	32 (44)
Anchor Arm Nut	78 (106)
Ball Joint Nut	
Lower	87-131 (118-177)

Upper	44-65 (59-88)
Ball Joint-To-Lower Control Arm Bolt	60 (81)
Ball Joint-To-Upper Control Arm Bolt	18 (25)
Bump Stop	18 (25)
Caliper Bolt	65 (88)
Control Arm-To-Frame Bolt/Nut	
Lower	101-116 (137-157)
Upper	72-87 (98-118)
Drive Flange	36-44 (49-59)
Shock Absorber Lower Mount Bolt	65-76 (88-103)
Shock Absorber Upper Nut	11 (15)
Torque Arm Nut	78 (106)
	INCH Lbs. (N.m)
Stabilizer Bar Clamp Bolt	106 (12)