

## **Domestic and Captive Imports (Passenger Vehicles)**

### **NOTES:**

\* Captive Imports are passenger cars imported by license agreements with U.S. Motor Vehicle Manufacturers and sold thru domestic dealerships.

NOTE: Vehicles with wear indicating ball joints – inspect with ball joint loaded  
(Preferably with the wheels on the ground.) (i).

Type 1: Spring or torsion bar located on lower control arm.

Type 2: Spring or torsion bar located on upper control arm.

- (a) Do not test ball joints by horizontal movement.
- (b) Preloaded by rubber or springs.
- (c) Do not test ball joints vertically. Check horizontal movement only using dial indicator.
- (d) Measured at drive axle nut.
- (e) Horizontal movement tests for American Motors cars from 1970 thru 1986 excluding Pacer. Play should be measured at outside wheel rim and not at the ball joint.
- (f) No play allowed on lower ball joint.
- (g) See inspection procedure Chrysler Ball Joint. (Vehicle must be hoisted from under the right and left lower control arms at the same time and the vehicle must be stable, Torsion bar equipped vehicles)
- (h) Do not test ball joints by vertical movement.
- (i) Vertical movement is checked by sight. Wear is indicated by the position of the housing into which the grease fitting is threaded. This round housing projects 1.27mm (0.050”) beyond the surface of the ball joint cover on a new, unworn ball joint. Normal wear will result in the surface of this housing retreating very slowly inward.
- (j) Do not pry between the lower control and the drive axle seal or in such a manner that the ball joint seal is contacted. Damage to the seal will result (4WD).
- (k) Turning force at the end of knuckle arm for Mazda models should be within 9-14 kgs. (18-30 lbs.)
- (l) Check vertical ball joint movement with ball joints fully loaded. With vehicle resting on all wheels, use a pry bar or similar leverage to apply vertical force to lower control arm at ball joint and observe play on properly attached dial indicator.
- (m) Inspection procedure; position vehicle on level surface, remove lubrication plug from lower ball joint, check clearance by inserting stiff wire or thin rod into lubrication plug hole until it contacts ball stud. Accurately mark wire or rod where it is flush with outer edge of plug hole. Measure distance from mark to end of wire or rod. (Anything less than 7/16” is ok.) Reinstall lubrication plug.
- (n) With the weight of the vehicle resting on the tires, grasp the grease fitting and attempt to move, no mechanical assistance or added force is necessary. Reject if grease fitting shows any movement. (81-83)

**DOMESTIC and CAPTIVE IMPORTS  
( Passenger Vehicles )**

**Manufacturer's Tolerances for Ball Joint Wear.**

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>American Motors</b>					
All Models Except Listed		RWD 62-69		No Upper Ball Joint	(f)
		RWD 70-80	2	0.08	.160 (e)
		RWD 81-88	2	(c & f)	.160 (e)
		RWD 75-80	2	0.08	.160
		RWD 81-88	2	( c )	.160
Alliance, Encore		FWD 83-87	STRUT	No Play	No Play
Pacer		RWD 75-80	1	Wear Ind. (m)	(a)
Rambler		RWD 62-69	2	No Upper Ball Joint	(f)
<b>Buick</b>					
All Models Except Listed		RWD 57-60	1	.150	.250
		61-70	1	.100	.250
		71-72	1	.020	(a)
		73-82	1	Wear Ind.	(a)
		82-93	1	.000	.000
		RWD 75-96	1	Wear Ind.	(a)
	(Rear Susp.)	FWD 85-97	STRUT	Wear Ind.	(a)
	(Front Susp.)	FWD 85-97	STRUT	No Play	No Play
Apollo		RWD 1974	1	.0625	(a)
		RWD 75-79	1	Wear Ind.	(a)
		FWD 80-97	STRUT	No Play	No Play
Buick Special		RWD 61-63	1	.080	.250
		64-68	1	.060	.250
		69-71	1	.070	.250
Century, Regal		RWD 1973	1	.020 (b)	(a)
		RWD 74-81	1	Wear Ind.	(a)
Century		FWD 1981	1	.020 (b)	(a)
		FWD 82-97	STRUT	No Play	No Play
Lesabre, Park Avenue, Wildcat, Electra, Centurion		RWD 73-88	1	Wear Ind.	(a)
Lesabre, Park Avenue		FWD 92-98	STRUT	( c )	.000
Park Avenue		FWD 97-	STRUT	No Play	No Play
Lesabre, Electra Estate Wagon		RWD 88-92	1	( c )	.125
Roadmaster Wagon		RWD 91-98	1	Wear Ind.	(a)
Opel		RWD 74-75	1	.080	(a)
		76-79	1	.040	(a)
Regal		RWD 74-87	1	Wear Ind.	.000
		FWD 88-98	STRUT	No Play	No Play
Riviera		RWD 79-85	1	.125 (d)	(a)
Riviera, Reatta		FWD 86-98	STRUT	No Play	No Play
Skyhawk, Sommerset		RWD 75-81	1	Wear Ind.	(a)
Skyhawk, Sommerset		FWD 82-89	STRUT	No Play	No Play
Skylark		RWD 80-96	1	.000	(a)
<b>Cadillac</b>					
All Models Except Listed		RWD 57-69	1	.062	.250
	(Front Susp.)	FWD 82-97	STRUT	.000	.000
	(Rear Susp.)	FWD 82-97	STRUT	Wear Ind.	(a)
Allante		FWD 87-93	STRUT	No Play	No Play
Calais, DeVille, Fleetwood		57-73	1	.062	(a)

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>Cadillac (Cont.)</b>					
Calais, DeVille, Fleetwood, Brougham	RWD	74-96	1	Wear Ind.	(a)
Catera	FWD	97-98	STRUT	No Play	No Play
Cimarron	FWD	82-86	STRUT	No Play	No Play
Eldorado	FWD	67-78	1	.125	.125
		79-85	1	.125 (d)	(a)
		86-97	STRUT	No Play	No Play
Seville	RWD	76-79	1	Wear Ind.	(a)
	FWD	80-85	1	.125 (d)	(a)
	FWD	86-97	STRUT	No Play	No Play
Sedan, DeVille, Concours	FWD	94-96		( c )	.000
<b>Checker</b>					
TAXICAB (A-11, A-11E)					
MARATHON (A-12, A-12E, A-12W)	RWD	69-80	1	.065	(a)
<b>Chevrolet</b>					
All Models Except Listed	RWD	55-63	1	.093	.250
		64-70	1	.060	.250
		71-72	1	.020	(a)
	RWD	73-96	1	Wear Ind.	(a)
	FWD	82-98	STRUT	.000	.000
Beretta, Cosica	FWD	87-96	STRUT	No Play	No Play
Biscayne, Bel Air, Impala, Caprice	RWD	71-72	1	.020	(a)
		73-95	1	Wear Ind.	(a)
Camaro	RWD	67-69	1	.060	.250
		70-73	1	.020 (b)	(a)
		74-81	1	Wear Ind.	(a)
		82-92	STRUT	Wear Ind.	(a)
		93-94	1	Wear Ind.	(a)
		95-96	1	No Play	No Play
		97-98	1	.046	(a)
Cavalier	FWD	82-97	STRUT	.000	.000
Celebrity	FWD	80-97	STRUT	.000	.000
Chevelle, Deluxe, Malibu, Nova, Monte Carlo, Laguna, El Camino	RWD	64-70	1	.060	.250
		71-72	1	.0625	(a)
		1973	1	.020	(a)
		74-88	1	Wear Ind.	(a)
Chevy II	RWD	62-63	2	.093	.250
Chevy II	RWD	64-69	2	.060	.250
Malibu	FWD	-97	STRUT	No Play	No Play
Monte Carlo	FWD	90-97	STRUT	No Play	No Play
Chevette	RWD	76-87	1	Wear Ind.	(a)
Citation	FWD	80-97	STRUT	.000	.000
Corvair	RWD	60-63	1	.093	.250
		64-70	1	.060	.250
Corvette	RWD	53-63		Not Applicable	- - - -
		64-70	1	.060	.250
		71-82	1	.060	(a)
		83-96	1	Wear Ind.	(a)
		97-98	1	.000	.000
Lumina (Coupe, Sedan), Monte Carlo	FWD	90-98	STRUT	No Play	No Play

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>Chevrolet (Cont.)</b>					
Nova (Chevy II)	RWD	62-63	2	.093	(a)
		64-67	2	.060	.250
		68-70	1	.060	(a)
		71-74	1	.0625	(a)
		75-79	1	Wear Ind.	(a)
Vega	RWD	71-74	1	.0625	(a)
Vega, Monza	RWD	75-81	1	Wear Ind.	(a)
<b>Chrysler</b>					
All Models Except Listed	RWD	57-64	1	.050	(a)
	RWD	65-73	1	.070	(a)
	RWD	74-76	1	.020	(a)
	RWD	77-89	1	.030 (b)	(a & g)
	FWD	82-95	STRUT	Wear Ind.	(a)
Cirrus	FWD	95-97	1	.059	(a)
Concorde	FWD	93-97	STRUT	(h)	.000 (g)
Conquest	FWD	1989	STRUT	Special Test Procedures	
Chrysler TC / Maserati	FWD	1991	STRUT	.000	(a)
Cirrus	FWD	95-98	STRUT	(g)	(g)
Desoto	RWD	57-61	1	.050	.250
E Class, LeBaron, Fifth Avenue, Imperial, New Yorker	FWD	82-93	2	.000	(a)
Imperial	RWD	57-66	1	.050	.250
		67-75	1	.020	(a)
Laser	FWD	84-86	2	.000	(a)
LeBaron	FWD	94-95	STRUT	.000	(a)
New Yorker, LHS	FWD	94-97	STRUT	No Play (h)	No Play (g)
Sebring	FWD	95-97	1	Special Test Procedures	
Sebring Convertible	FWD	95-97	1	.059	(a)
<b>Dodge</b>					
All Models Except Listed	RWD	57-67	1	.050	(a)
		68-73	1	.070	(a)
		74-76	1	.020	(a)
		77-87	1	.030 (b)	(a & g)
Aries	FWD	1980	STRUT	.050	(a)
Aries 400, 600	FWD	81-89	STRUT	.000 (n)	(a)
Avenger (Front Susp.)	FWD	95-97	1	Special Test Procedures	
(Rear Susp.)				Special Test Procedures	
Caravan	FWD	84-85	STRUT	.000	(a)
Challenger	RWD	70-73	1	.070	(a)
Challenger, Sapporo	FWD	78-83	STRUT	No Play	No Play
Charger, Coronet		73-74	1	.020	(a)
Colt	RWD	75-80	STRUT	No Play	No Play
	FWD	79-88	STRUT	No Play	No Play
	FWD	89-92	STRUT	Special Test Procedures	
	FWD	93-96	STRUT	Special Test Procedures	
Colt Vista	FWD	89-96	STRUT	Special Test Procedures	
Dart, Lancer	RWD	60-67	1	.050	(a)
Dart, Demon	RWD	68-76	1	.070	(a)
Daytona	FWD	84-93	STRUT	.000	(a)
Dynasty	FWD	88-93	STRUT	.000	(a)
Intrepid	FWD	93-98	STRUT	No Play (h)	No Play (g)
Lancer	FWD	85-89	STRUT	.000	(a)
Monaco	RWD	1974	1	.020	(a)
	FWD	90-92	STRUT	No Play	No Play

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>Dodge (cont.)</b>					
Neon	FWD	95-98	STRUT	.000	(a)
Omni	FWD	78-80	STRUT	.050	(a)
		81-83	STRUT	(n)	(n)
Omni, Charger	FWD	81-90	STRUT	.000 (n)	(a)
Polara	RWD	1973	1	.070	(a)
Shadow	FWD	87-94	STRUT	.000	(a)
Spirit	FWD	89-95	STRUT	.000	(a)
Stealth	FWD	91-96	STRUT	Special Test Procedures	
Stratus	FWD	95-98	1	.059	(a)
Viper	RWD	92-98	1	No Play	No Play
<b>Eagle</b>					
Premier	FWD	88-92	STRUT	.000	.000
Medallion	FWD	1989	STRUT	.000	.000
Summit	FWD	92-96	STRUT	Special Test Procedures	
Talon	FWD	95-97	STRUT	Special Test Procedures	
Vision	FWD	93-97	STRUT	(h)	.000 (g)
<b>Edsel</b>					
All Models	RWD	58-60	1	.200	.250
<b>Ford</b>					
All Models Except Listed	RWD	52-56	1	.000	.250
		57-6/61	1	.200	.250
		7/61-69	1	.000	.250
		70-80	2	(c)	.250
Aspire	FWD	94-97	STRUT	No Play	No Play
Contour	FWD	95-98	STRUT	No Play	No Play
Crown Victoria	RWD	79-94	1	Wear Ind.	(a)
Crown Victoria	RWD	95-98	1	(c)	.015
Escort, EXP	FWD	81-96	STRUT	No Play Allowed	No Play Allowed
Escort	FWD	97	1	(c)	.031
Fairlane	RWD	62-70	2	(c)	.250
Fairmont	RWD	78-83	1	Wear Ind.	(a)
Falcon	RWD	60-62	1	.200	.250
	RWD	63-70	2	(c)	.250
Festiva	FWD	88-95	STRUT	No Play	No Play
Granada	RWD	75-80	2	(c)	.250
Granada	RWD	81-82	STRUT	Wear Ind.	(a)
LTD II	RWD	83-86	STRUT	Wear Ind.	(a)
Maverick	RWD	70-77	2	(c)	.250
Mustang	RWD	65-73	2	(c)	.250
	RWD	74-78	1	(c)	.250
	RWD	79-93	STRUT	Wear Ind.	(a)
	RWD	94-98	STRUT	(c)	.015
Pinto	RWD	71-75	2	(c)	.250
Probe	FWD	89-97	STRUT	No Play	No Play
Taurus	FWD	86-93	STRUT	No Play	No Play
	FWD	94-98	STRUT	(c)	No Play
Tempo	FWD	83-93	STRUT	No Play	No Play
	FWD	94-96	STRUT	(c)	No Play
	RWD	55-57	1	.000	.250
Thunderbird		58-60	1	.200	.250
		61-66	1	(c)	.250
		67-69	1	.000	.250

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>Ford (Cont.)</b>					
Thunderbird (Cont.)		70-77	1	.200	.250
		80-88	STRUT	Wear Ind.	(a)
		89-93	1	( c )	No Play
		94-97	1	( c )	.015
Torino	RWD	68-79	1	( c )	.250
<b>Lincoln</b>					
All Models Except Listed	RWD	52-56	1	.000	.250
		57-69	1	.200	.250
		70-79	1	( c )	.250
Continental	RWD	82-87	1	Wear Ind.	(a)
	FWD	88-93	STRUT	No Play	No Play
	FWD	95-98	STRUT	No Play	No Play
	RWD	94-96	1	( c )	No Play
Mark	RWD	80-92	1	Wear Ind.	(a)
		1993	1	( c )	No Play
	RWD	1994	STRUT	No Play	No Play
		95-96	STRUT	( c )	.015
		97-98	1	Wear Ind.	(a)
Town Car	RWD	80-93	1	Wear Ind.	(a)
	RWD	94-98	1	( c )	.015
Versailles	RWD	77-80	2	No Play	No Play
<b>Mercury</b>					
All Models Except Listed	RWD	52-56	1	.000	.250
		57-6/61	1	.200	.250
		7/61-69	1	.000	.250
		70-79	1	( c )	.250
Capri	RWD	79-86	STRUT	Wear Ind.	(a)
	FWD	91-95	STRUT	No Play	No Play
Comet	RWD	60-62	2	.200	.250
		63-77	2	( c )	.250
Cougar	RWD	67-79	2	( c )	.260
		80-88	STRUT	Wear Ind.	(a)
		89-93	1	( c )	.015
		94-97	1	( c )	.015
LN7	FWD	81-89	STRUT	No Play	No Play
Lynx	FWD	81-89	STRUT	No Play	No Play
Grand Marquis	RWD	75-78	1	.000	.250
		79-94	1	Wear Ind.	(a)
		95-98	1	( c )	.015
Marquis	RWD	83-86	STRUT	Wear Ind.	(a)
Meteor	RWD	62-66	2	( c )	.250
Monarch	RWD	75-80	2	( c )	No Play
		81-82	STRUT	Wear Ind.	(a)
Montego	RWD	68-71	2	( c )	.250
		72-79	2	( c )	.250
Mystique		95-98	STRUT	No Play	No Play
Sable	FWD	86-93	STRUT	No Play	No Play
		94-98	STRUT	( c )	No Play
Sable Wagon, (Rear Susp.)		96-97	STRUT	(a)	.031
Topaz	FWD	83-93	STRUT	No Play	No Play
		94-96	STRUT	( c )	No Play
Tracer	FWD	89-91	STRUT	No Play	No Play
		92-93	STRUT	Special Test Procedures	
		94-96	STRUT	No Play	No Play
		97-	STRUT	(a)	.031

Make/Model		Year	Type	Vertical Movement	Horizontal Movement
<b>Mercury (Cont.)</b>					
Zephyr	RWD	78-83	STRUT	Wear Ind.	(a)
XR-7		80-82	1	Wear Ind.	(a)
<b>Merkur</b>					
Scorpio	FWD	88-89		----	----
XR4Ti	FWD	86-89		----	----
<b>Oldsmobile</b>					
All Models Except Listed	RWD	52-70	1	.125	.250
		71-72	1	.020	(a)
		73-81	1	Wear Ind.	(a)
		82-98	1	.000	.000
	(Front Susp.) FWD	85-97	STRUT	.000	.000
	(Rear Susp.) FWD	85-97	STRUT	Wear Ind.	(a)
Aurora	FWD	95-98	STRUT	( c )	.000
Calais, Ciera, Cutlass	FWD	82-97	STRUT	.000	.000
Cutlass, F85 Custom Cruiser	RWD	61-63	1	.090	.250
		64-70	1	.125	.250
		71-72	1	.0625	(a)
		1973	1	.020	(a)
		74-88	1	Wear Ind.	(a)
Custom Cruiser Wagon	FWD	1995	STRUT	Wear Ind.	(a)
Delta 88	RWD	73-85	1	Wear Ind.	(a)
Firenza	FWD	82-97	STRUT	.000	.000
Intrique	FWD	98-	STRUT	.000	.000
Ninety-Eight	RWD	73-84	1	Wear Ind.	(a)
Omega	FWD	73-74	STRUT	.0625 (e)	(a)
		80-97	STRUT	.000	.000
Starfire	RWD	75-80	1	Wear Ind.	(a)
Toronado	FWD	66-78	1	.125	.250
		79-85	1	.125 (d)	(a)
		86-92	STRUT	.000	.000
<b>Plymouth</b>					
All Models Except Listed	RWD	57-67	1	.050	(a)
		68-73	1	.070	(a)
		74-76	1	.020	(a)
		77-86	1	.030 (b)	(a & g)
	FWD	78-80	STRUT	.050	(a)
	FWD	81-95	STRUT	Wear Ind.	Wear Ind.
Acclaim	FWD	89-95	STRUT	.000	(a)
Arrow	RWD	76-80	STRUT	.000	.000
Barracuda, Valiant	RWD	60-67	1	.050	(a)
		68-76	1	.070	(a)
Caravelle		85-87	STRUT	.020 (b)	(a)
Colt	RWD	71-72	1	.020	(a)
Cricket	RWD	71-72	1	.020	(a)
Fury	RWD	1973	1	.070	(a)
		1974	1	.020	(a)
Horizon	FWD	78-80	STRUT	.050	(a)
Horizon, Turismo	FWD	81-90	STRUT	.000 (n)	(a)
Neon	FWD	95-98	STRUT	.000	(a)
Prowler	RWD	97-		Special Test Procedures	
Reliant	FWD	1980	STRUT	.050	(a)
		81-89	STRUT	.000 (n)	(a)
Satellite		1973	1	.020	(a)
Sundance	FWD	87-94	STRUT	.000	(a)
Voyager	FWD	84-89	STRUT	.000	(a)

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>Pontiac</b>					
All Models Except Listed	RWD	57-64	1	.060	(a)
	RWD	65-70	1	.050	(a)
	RWD	71-72	1	.020	(a)
	RWD	73-81	1	Wear Ind.	(a)
	FWD	82-96	STRUT	.000	.000
6000	FWD	82-91	STRUT	.000	.000
Astre, Sunbird	RWD	75-80	1	Wear Ind.	(a)
Bonneville, Parisienne, Safari Wag	RWD	74-89	1	Wear Ind.	(a)
Bonneville (Front Susp.)	FWD	85-97	STRUT	.000	.000
Bonneville (Rear Susp.)	FWD	85-97	STRUT	Wear Ind.	(a)
Fiero	RWD	84-88	STRUT		
	(Front Susp.)			Wear Ind.	(a)
	(Rear Susp.)			.000	.000
Firebird	RWD	71-73	1	.020	(a)
	RWD	74-81	1	Wear Ind.	(a)
	RWD	82-92	STRUT	Wear Ind.	(a)
	RWD	93-94	1	Wear Ind.	(a)
	RWD	95-96	1	.000	.000
	RWD	97-98	1	.046	(a)
Grand Prix, LeMans		70-72	1	.0625	(a)
Grand Prix	RWD	73-86	1	Wear Ind.	(a)
Grand Prix	FWD	87-98	STRUT	.000	.000
Grand Am, Grand Prix		1973		.020	(a)
Grand Am, Grand Prix, LeMans, (Bonneville)	RWD	74-87	1	Wear Ind.	(a)
Grand Am, LeMans, Tempest	RWD	65-69	1	.050	(a)
	FWD	85-95	STRUT	.000	.000
J2000, 2000, Sunbird	FWD	82-94	STRUT	.000	.000
Phoenix, Ventura	RWD	75-79	1	Wear Ind.	(a)
Phoenix	FWD	80-85	STRUT	.000	.000
Sunfire	FWD	95-97	STRUT	.000	.000
T1000, 1000	RWD	81-87	1	Wear Ind.	(a)
Tempest	RWD	61-63	1	.093	.250
		1964	1	.060	.250
		65-69	1	.050	(a)
Ventura	RWD	71-74	1	.0625	(a)
<b>Saturn</b>					
All Models Except Listed	FWD	91-96	STRUT	.000	.000



**FOREIGN MANUFACTURER'S IMPORTS**  
**MANUFACTURER'S Tolerances For Ball Joints**

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>Alfa Romero</b>					
All Models Except Listed	RWD	57-89		.060	(a)
<b>BMW</b>					
All Models Except Listed	RWD	75-89	STRUT	.055	(a)
318i, 325, 325e, 325i, 325is, 325i c	RWD	75-90	STRUT	.055	(a)
528e, 533i, 535i, 535is	RWD	82-88	STRUT	.060	(a)
735i, 750i	RWD	87-89	STRUT	.039	(a)
<b>Citroen</b>					
All Models		Thru 78		None	None
<b>Datsun</b>					
All Models Except Listed		68-79		None	.024
B110		70-72		None	.040
F10		76-78		None	None
<b>Geo</b>					
Metro, Prizm, Storm	FWD	89-97	STRUT	.000	.000
<b>Honda</b>					
All Models Except Listed		Thru 79		None	None
Accord	FWD	76-85	STRUT	.020	(a)
	FWD	86-89		Do Not Test	Do Not Test
Civic	FWD	75-83	STRUT	.020	(a)
Civic, CRX	FWD	84-89		Do Not Test	Do Not Test
Prelude	FWD	79-82	STRUT	.020	(a)
	FWD	83-89		Do Not Test	Do Not Test
<b>Hyundai</b>					
Accent	FWD	1995	STRUT	.000	.000
Elantra	FWD	93-95	STRUT	.000	.000
Excel	FWD	90-94	STRUT	.000	.000
Scoupe	FWD	93-95	STRUT	.000	.000
Sonata	FWD	90-94	STRUT		Special Test
		1995	STRUT		Special Test
<b>Infiniti</b>					
All Models Except Listed	FWD	90-98	STRUT	.000	.000
M30, J30	FWD	90-96	STRUT	.051	(a)
Q45	(Front Sus FWD	90-96	STRUT	.000	(a)
	(Rear Sus FWD	90-96	STRUT	.000	(a)
<b>Isuzu</b>					
I-Mark	RWD	81-85	1	.040	(a)
	FWD	86-89	STRUT	.000	.000
Impulse, Stylus	RWD	83-92	1	.040	(a)
<b>Jaguar</b>					
All Models	RWD	82-87		.060	.040
		88		.006	.007

Make/Model		Year	Type	Vertical Movement	Horizontal Movement
<b>Mazda (k)</b>					
All Models Except Listed		Thru 97			Special Test
B1600, Rotary Pickup, B1800, B2000		Thru 97			Special Test
<b>Mitsubishi</b>					
3000	FWD	91-95	STRUT		Special Test
Cordia, Tredia	FWD	83-88	STRUT	.000	.000
Diamante	FWD	92-95	STRUT	.000	.000
Eclipse	FWD	92-94	STRUT	.000	.000
	FWD	1995	STRUT		Special Test
Expo	FWD	92-95	STRUT		Special Test
Galant	FWD	85-93	STRUT	.000	.000
		1994	STRUT		Special Test
		1995	1		Special Test
Mirage	FWD	85-92	STRUT	.000	.000
		93-95	STRUT		Special Test
Precis	FWD	90-92	STRUT	.000	.000
Starion	FWD	83-88	STRUT	.000	.000
<b>Nissan</b>					
All Models Except Listed	FWD	75-88	STRUT	.040	(a)
200SX	RWD	1983	STRUT		Special Test
	RWD	84-85	STRUT	.000	.000
	RWD	1986	STRUT	.050	(a)
	RWD	1988	STRUT	.100	(a)
240SX	RWD	89-96	STRUT	.000	.000
300ZX	RWD	84-86	STRUT	.035	(a)
	RWD	88-89	STRUT	.100	(a)
	RWD	90-96	STRUT	.000	.000
810/Maxima	FWD	83-84	STRUT		Special Test
B210	RWD	75-78	STRUT	.012	(a)
F10, 310, Sentra, Pulsar	FWD	76-86	STRUT	.060	(a)
Maxima	FWD	85-87	STRUT	.040	(a)
	FWD	1988	STRUT	.100	(a)
	FWD	89-96	STRUT	.000	.000
Pulsar	FWD	1988	STRUT	.100	(a)
Pulsar NX	FWD	89-93	STRUT	.000	.000
Sentra	FWD	1987	STRUT	.030	(a)
	FWD	88-96	STRUT	.000	.000
Stanza (exc. Wagon)	FWD	82-86	STRUT	.080	(a)
	FWD	1987	STRUT	.040	(a)
	FWD	1988	STRUT	.100	(a)
	FWD	1989	STRUT	.040	(a)
	FWD	90-92	STRUT	.000	.000
Stanza, Altima	FWD	93-96	STRUT	.000	.000
Stanza Wagon	FWD	1986	STRUT	.040	(a)
		1988		.100	None
<b>Puegeot</b>					
All Models Except Listed		57-75		.020	.020
403		57-75		No Play	No Play
<b>Renault</b>					
All Models		Thru 77		.200	.020
		78-79		.040	.040
<b>Rolls Royce</b>					
All Models		67-88		None	None

Make/Model		Year	Type	Vertical Movement	Horizontal Movement
<b>Saab</b>					
99, 900		Thru 80		None	None
9000		86-88		None	None
<b>Subaru</b>					
All GL/DL Models	FWD	73-80	STRUT	( c )	3/32
All Other Models		73-84		Do Not Test	Do Not Test
(Except Justy)		85-89		.012	Do Not Test
Justy		87-89		.016	Do Not Test
<b>Toyota</b>					
All Models Except Listed	RWD	Thru 79	STRUT	.090	(a)
Avalon	FWD	95-97	STRUT	Special Test	
Camry	FWD	83-91	STRUT	.000	.000
	FWD	92-97	STRUT	Special Test	
Celica	RWD	75-85	STRUT	.100	(a)
	FWD	86-93	STRUT	.000	.000
	FWD	94-97	STRUT	Special Test	
Celica (RA22, RA42, MA46), Cressida (Mx32), Corona (RT134), Corolla (KE10, KE11, KE20, TE20, TE31)		Thru 79	STRUT	.100	(a)
Corolla	RWD	75-86	STRUT	.100	(a)
	FWD	84-92	STRUT	.000	.000
	FWD	93-97	STRUT	Special Test	
Cressida	RWD	78-92	STRUT	.100	(a)
Mark II (Mx12)		Thru 79		.020	(a)
MR2	RWD	85-89	STRUT	.000	.000
	RWD	90-94	STRUT	.000	.000
MR2	RWD	1995	1	Special Test	
Paseo	FWD	92-97	STRUT	Special Test	
Starlet	RWD	81-84	STRUT	.000	.000
Supra	RWD	82-86	STRUT	.100	.000
	RWD	87-93	STRUT	.012	(a)
	RWD	94-95	STRUT	Special Test	
Tercel	FWD	80-90	STRUT	.000	.000
	FWD	91-97	STRUT	Special Test	
<b>Volkswagens</b>					
All Models Except Listed		Thru 99		None	None
<b>NOTE:</b> A special tool is required to check the condition of ball joints on Volkswagens; therefore, inspection stations are not required to inspect the ball joints other than a visual examination to determine obviously dangerous ball joints.					
<b>Volvo (1)</b>					
All Models Except Listed		Thru 88		3 mm	(a)
140, 164, (with spring joint)		Thru 88		5 mm	(a)
240, 260, 760		Thru 88		3 mm	(a)

\*Captive Imports are passenger cars imported by license agreements with U.S. Motor Vehicle Manufacturers and sold through domestic dealership.

**Note: Vehicles with wear indicating ball joints - inspect with ball joint loaded (Preferably with the wheels on the ground.) (l).**

- (a) Do not test ball joints by horizontal movement.
- (b) Preloaded by rubber or springs
- (c) Do not test joints vertically. Check horizontal movement only using dial indicator.
- (d) Measured at drive axle nut.
- (e) Horizontal movement tests for American Motors cars from 1970 through 1986 excluding Pacer. Play should be measured at outside wheel rim and not the ball joint.
- (g) See inspection procedure Chrysler Ball Joint.
- (h) Do not test ball joints by vertical movement.
- (l) Vertical movement is checked by sight. Wear is indicated by the position of the housing into which the grease fitting is threaded. This round housing projects 1,27mm (0.050") beyond the surface of the ball joint cover on a new unworn joint. Normal wear will result in the surface of this housing retreating very slowly inward.
- (j) Do not pry between the lower control arm and the drive axle seal or in such a manner that the ball joint seal is contacted. Damage to the seal will result (4wd).

**PICKUPS, TRUCKS AND BUSES**

**TABLE 2 - - Manufacturer's Tolerances for Ball Joint Wear - Light Trucks & MPV's/SUV's.**

<b>Make/Model</b>		<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>CHEVROLET</b>					
10, 20, 30,	RWD	60-84	1	.094	.250
10, 20, 30,	RWD	75-87	1	.093	(a)
10, 20,	4WD	75-88	AXLE	.000	.000
G10, G20, G30,	RWD	88-92	1	.093	(a)
G10, G20,	RWD	93-95	1	Wear Ind.	(a)
G30	RWD	93-95	1	Wear Ind.	.125
G10, G20, G30, VANS	RWD	96-97	1	.080	(a)
P10, P20, P30	RWD	88-91	1	.093	(a)
R10,R20,R30	RWD	88-91	1	.093	(a)
R30	RWD	82-97	1	Wear Ind.	(a)
Astro	RWD	85-98	1	Wear Ind.	(a)
Astro	4WD	90-93	1	.080	(a)
Blazer	4WD	75-91	AXLE	.000	.000
Cheyene, Tahoe/Blazer					
Suburban,	RWD	94-98	1	Wear Ind.	.125
	4WD	94-98	1	.080(e)	.125
Suburban,	4WD	87-91	AXLE	.000	.000
Suburban,	RWD	82-93	1	Wear Ind.	(a)
S-Series	RWD	82-97	1	Wear Ind.	(a)
S-Series	4WD	83-97	1	.125	(a)
V10, V20	4WD	88-91	AXLE	.000	.000
El Camino	RWD	75-87	1	Wear Ind.	(a)
Lumina APV	FWD	90-91	STRUT	.000	.000
		92-98	STRUT	.020	(a)
Venture	FWD	97-02	STRUT	.000	.000
<b>(OLDS)</b> Silhouette,	FWD	90-91	STRUT	.000	.000
		92-96	STRUT	.020	(a)
		97-98	STRUT	.000	.000
Bravada	AWD	94-98	1	.025	.125
<b>(PONTIAC)</b> Transport	FWD	90-96	STRUT	.020	(a)
		97-98	STRUT	.000	.000
<b>DATSUN/NISSAN</b>					
Pickup,	RWD	79-83	1	.040	(a)
	RWD	1984	1	.000	.000
	RWD	85-86	1	.040	(a)
		87-95	1	ower-.063, upper-.06	(a)
		96-	1	ower-.018, upper-.02	(a)
Pickup,	4WD	79-83	1	.040	(a)
	4WD	1984	1	.000	.000
	4WD	85-86	1	.040	(a)
	4WD	87-95	1	ower-.020, upper-.06	(a)
	4WD	96-	1	ower-.008, upper-.02	(a)
Pathfinder,	RWD	91-95	1	ower-.063, upper-.06	(a)
	RWD&4WD	96-	STRUT	No Play	No Play
	4WD	88-95	1	ower-.020, upper-.06	(a)
Quest	FWD	93-96	STRUT	No Play	No Play
Van	RWD	88-90	1	.063	(a)

Make/Model		Year	Type	Vertical Movement	Horizontal Movement
<b>DODGE, PLYMOUTH, CHRYSLER</b>					
B1,B2,B3,D1,D2,D3 (ALL THRU					
D15,D25,D35,W2,W3 1 TON					
W15,W25,W35,RD2, 2WD)					
WM3,MB3,CB3,AD1 AW1					
RAMCHARGER		71-84	1	.020 (b)	(a)
All thru 1 Ton 4WD		75-97	AXLE	.000	.000
All thru 1 Ton	RWD	75-95	1	.020	(a)
	RWD	96-98	1	.030	.030
Caravan, Voyager, Town/Country	FWD	84-98	STRUT	Wear Ind.	(a)
Dakota	RWD	87-98	1	.020	(a)
	4WD	87-98	1	.060	(a)
Rampage, Scamp		82-84	STRUT	.000	.000
<b>FORD/MERCURY</b>					
Aerostar	RWD	86-97	1	.000	(Both) .031
	AWD	90-97	1	.000	(Both) .031
Bronco 4WD AXLE		75-79	AXLE	.000	.000
TWIN I-BEAM		80-96	TWIN	.000	(Both) .031
Bronco II	RWD	87-96	TWIN	.000	(Both) .031
	4WD	84-96	TWIN	.000	(Both) .031
Econoline (all series)	RWD	92-98	TWIN	( c )	(Both) .031
Expedition	RWD	97-	1	( c )	(Both) .031
	4WD	97-	1	( c )	(Both) .031
Explorer	RWD	91-94	TWIN	( c )	(Both) .031
	RWD	95-98	1	( c )	(Both) .031
	4WD	91-94	TWIN	( c )	(Both) .031
	4WD	95-98	1	( c )	(Both) .031
F-150, Ranger 2WD, 4WD		81-98	TWIN	.000	.031
F-150		97-	1	.050	.050
F-100, F-150, F-250					
F-350 (4WD AXLE)	4WD	75-91	AXLE	.000	.000
F-350	4WD	80-85	TWIN	( c )	(Both) .031
F Super Duty Body	RWD	94-98	TWIN	( c )	(Both) .031
Villager (Merc)	FWD	94-96	STRUT	No Play	(a)
Windstar	FWD	95-96	STRUT	( c )	No Play
<b>GMC</b>					
1500, 2500, 3500	RWD	60-84	1	.094	.250
	RWD	92-98	1	.080	(a)
All K-Series P,	4WD	88-97	1	.080	(a)
K3500 4DR P/U	4WD	92-97	1	.080	(a)
Caballero	RWD	75-87	1	Wear Ind.	(a)
Express		96-98	1	.080	.125
Jimmy	RWD	75-87	1	.093	(a)
	4WD	75-87	AXLE	No Play	No Play
	4WD	87-91	AXLE	No Play	No Play
Sierra, Yukon, Suburban	RWD	87-91	1	.093	(a)
	4WD	87-91	AXLE	No Play	No Play
	RWD	94-98	1	Wear Ind.	.125
	RWD	92-97	1	.080	(a)
	4WD	92-93	1	.080	(a)
	4WD	94-98	1	.080 (j)	.125
S-Series, Jimmy	RWD	82-84	1	Wear Ind.	(a)
	RWD	94-97	1	Wear Ind.	.125
	4WD	82-97	1	.125	(a)
Safari	RWD	85-88	1	Wear Ind.	(a)
		94-98	1	Wear Ind.	.125
	4WD	90-93	1	.080	(a)
Savana		96-98		.080	.125
Sprint, Caballero	RWD	75-87	1	Wear Ind.	(a)
Vandura		94-98	1	Wear Ind.	(a)

<b>Make/Model</b>	<b>Year</b>	<b>Type</b>	<b>Vertical Movement</b>	<b>Horizontal Movement</b>
<b>INTERNATIONAL</b>				
10, 150, 200	RWD	74-80	.095	(a)
1000, 1010	RWD	60-73	.045	(a)
Scout (All Models)			.020	(a)
TravelAll 1000, 1010	RWD	60-73	.095	(a)
<b>JEEP</b>				
All Models		63-64	.060	.120
<b>PLYMOUTH</b>				
PB1, PB2, PB3, PD1, PW1, Trail Duster	RWD	74-84	1	.020 (b) (a)
All thru 1 Ton	4WD	75-86	1	.000 .000
Voyager	FWD	84-98	SRUT	Wear Ind. (a)
Scamp	RWD	82-84	STRUT	.000 .000
<b>TOYOTA</b>				
Pickup	RWD	81-94	1	ower-.091, upper-.09 (a)
		95-	1	Special Test
	4WD	86-90	1	ower-.000, upper-.09 (a)
		91-94	1	ower-.091, upper-.00 (a)
		95-	1	Special Test
FourRunner	4WD	86-90	1	ower-.000, upper-.09 (a)
		91-94	1	ower-.091, upper-.00 (a)
		95-97	1	Special Test
T-100 2WD	RWD	95-97	1	Special Test
		94	1	.000 .000
T-100 4WD	4WD	95-97	1	Special Test
		94	1	ower-.091, upper-.00 (a)
Tacoma 2WD	RWD	96-97	1	Special Test
	4WD	96-97	1	Special Test
Van	FWD	84-85	1	ower-.091, upper-.09 (a)
	FWD	86-89	1	.000 .000