Manual chrysler caravan 1998

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MITSUBISHI

ENGINE 6G7 SERIES (E-W)

WORKSHOP MANUAL

FOREWORD

This Workshop Manual contains procedures for removal, disassembly, inspection, adjustment, reassembly and installation, etc. for service All information, illustrations and product descriptions contained in this manual are current as at the time of publication. We, however, reserve the right to make changes at any time without prior notice or obligation.



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MITSUBISHI MOTORS CORPORATION

C Mitsubishi Motors Corporation Apr. 2001





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SERVICE PROCEDURES (Continued)

(3) Position the tubing in the jaws of the Flaring Tool so that it is flush with the top surface of the flaring tool bar assembly. (Fig. 40)

(4) Install the correct size adaptor for the brake tubing being flared, on the feed screw of the yoke assembly. Center the yoke and adapter over the end of the tubing. Apply lubricant to the adapter area that contacts brake tubing. Making sure the adapter pilot is fully inserted in the end of the brake tubing. Screw in the feed screw of the yoke assembly until the adaptor has seated squarely on the surface of the bar assembly (Fig. 40). This process has created the (metric) ISO tubing flare.



Fig. 40 Brake Tubing ISO Flaring Process PARKING BRAKE AUTO ADJUSTER MECHANISM

Releasing Auto Adjuster

(1) With the parking brake pedal in its released position, reach under the vehicle on the driver's side and pull rearward on the front cable creating slack. Secure the front cable in this position by grasping the cable with locking pliers and locking them in place just past the second outrigger bracket (in front of the equalizer bracket).

(2) Remove the front parking brake cable from the equalizer bracket.

(3) Release the locking pliers. The cable will move a short distance until the adjuster meets its stop.

Engaging Auto Adjuster

(1) Repeat step (1) under RELEASING AUTO ADJUSTER. (2) Connect the front parking brake cable to the

equalizer bracket.

1997 Town and Country, Ceravan, and Voyeger

(3) Remove the locking pliers.
(4) Apply and release the parking brake pedal 1 time. This will seat the parking brake cables.

REMOVAL AND INSTALLATION

WHEEL AND TIRE INSTALLATION

Publication No. 81-370-7105

To install the wheel and tire assembly, first position it properly on the mounting surface using the hub pilot as a guide. Then progressively tighten the lug nuts in the proper sequence to half of the required torque. Finally tighten the lug nuts in the proper sequence to 129 N·m (95 ft. lbs.). Never use oil or grease on studs or nuts.

FRONT DISC BRAKE CALIPER

SERVICE PRECAUTIONS

WARNING: ALTHOUGH FACTORY INSTALLED BRAKE LININGS ARE MADE FROM ASBESTOS FREE MATERIALS, SOME AFTER MARKET BRAKE LINING MAY CONTAIN ASBESTOS. THIS SHOULD BE TAKEN INTO ACCOUNT WHEN SERVICING A VEHICLE'S BRAKE SYSTEM, WHEN AFTERMARKET BRAKE LININGS MAY HAVE BEEN INSTALLED ON THE VEHI-CLE. ALWAYS WEAR A RESPIRATOR WHEN CLEAN-ING BRAKE COMPONENTS AS ASBESTOS CAN CAUSE SERIOUS BODILY HARM SUCH AS ASBES-TOSIS AND OR CANCER. NEVER CLEAN BRAKE COMPONENTS BY USING COMPRESSED AIR, USE ONLY A VACUUM CLEANER SPECIFICALLY DESIGNED FOR THE REMOVAL OF BRAKE DUST. IF A VACUUM CLEANER IS NOT AVAILABLE, CLEAN BRAKE PARTS USING ONLY WATER-DAMPENED SHOP TOWELS. DO NOT CREATE BRAKELINING DUST BY SANDING BRAKE LININGS WHEN SERVIC-ING A VEHICLE. DISPOSE OF ALL DUST AND DIRT SUSPECTED OF CONTAINING ASBESTOS FIBERS USING ONLY SEALED AIRTIGHT BAGS OR CON-TAINERS. FOLLOW ALL RECOMMENDED SAFETY PRACTICES PRESCRIBED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND THE ENVIRONMENTAL PROTECTION AGENCY (EPA), FOR HANDLING AND DISPOSAL OF PROD-UCTS CONTAINING ASBESTOS.

CAUTION: During service procedures, grease or any other foreign material must be kept off brake shoe assemblies, and braking surfaces of brake drum and external surfaces of hub/bearing assem-

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Plate (Fig. 3) is located in the engine compartment on the radiator closure panel crossmember. There are seven lines of information reads from left to right, starting with line 3 in the center of the plate to line 1 at the bottom of the plate. Fig. 1 Vehicle Safety Certification Label Fig. 2 Vehicle Identification Number (VIN Plate) NS INTRODUCTION 1 4. BODY CODE PLATE - LINE 3 DIGITS 13 THROUGH 17 Open space DIGITS 18 AND 19 Vehicle Shell Line • NS DIGIT 20 Carline FWD • H = Plymouth • K = Dodge • S = Chrysler AWD • C = Chrysler D = Dodge • P = Plymouth VIN CODE BREAKDOWN CHART POSITION INTERPRETATION CODE = DESCRIPTION 1 Country of Origin 1 = United States 2 = Canada 2 Make B = Dodge C = Chrysler P = Plymouth 3 Vehicle Type 4 = Multipurpose Pass. Vehicle 4 Gross Vehicle 4 Gross Vehicle 4 Gross Vehicle 5 Car Line P = Plymouth 3 Vehicle 7 Plymouth 3 Vehicle 7 Plymouth 3 Vehicle 7 Plymouth 3 Vehicle 4 Gross Vehicle 7 Plymouth 3 Vehicle 7 Plymouth 7 P Chrysler, Town & Country P = Dodge, Caravan/Grand Caravan P = Plymouth, Voyager/Grand Voyager T = AWD Chrysler, Town & Country Chrysler, Town & Country T = AWD Chrys Caravan LE or ES/Grand Caravan LE or ES, Voyager LE/Grand Voyager LE, Town & Country LX 6 = Town & Country LX 7 Body Style 4 = Long Wheel Base 5 = Short Whe Model Year V = 1997 11 Assembly Plant B = St. Louis South R = Windsor 12 thru 17 Sequence Number 6 digit number assigned by assembly plant. 2 INTRODUCTION NS GENERAL INFORMATION (Continued) 5. DIGIT 21 Price Class • H = Highline • L = Lowline • P = Premium • S = Luxury DIGITS 22 AND 23 Body Type • 52 = Short Wheel Base 53 = Long Wheel Base BODY CODE PLATE LINE 2 DIGITS 1, 2 AND 3 Paint procedure DIGIT 4 Open Space DIGITS 5 THROUGH 13 Secondary Paint DIGIT 14 Open Space DIGITS 15 THROUGH 18 Interior Trim Code DIGIT 19 Open Space DIGITS 20, 21, AND 22 Engine Code • EDZ = 2.4L 4 cyl. DOHC Gasoline • EGA = 3.0L 6 cyl. Gasoline • EGA = 3.1 6 cyl. Gasoline • EGA = 3.3L 6 cyl. Gasoline • EGA = 3.1 H 3-Speed Automatic Transaxle • DGB = 31TH 3-Speed Transaxle DIGIT 4 Open Space DIGIT 5 Market Code • C = Canada • B = International • M = Mexico • U = United States DIGIT 6 Open Space DIGIT 5 THROUGH 23 Vehicle Identification Number • Refer to Vehicle code shown on either plate will be fol- lowed by END. When a second plate is required, the last code space on the first plate will indicate (CTD) When a second plate is required, the first four spaces of each line will not be used due to overlap of the plates. Fig. 3 Body Code Plate NS INTRODUCTION 3 GENERAL INFORMATION (Continued) 6 INTERNATIONAL VEHICLE CONTROL AND DISPLAY SYMBOLS INTERNATIONAL VEHICLE CONTROL AND DISPLAY SYMBOLS The graphic symbols illustrated in the following chart (Fig. 4) are used to identify various instrument controls. The symbols correspond to the controls and displays that are located on the instrument panel. FASTENER IDENTIFICATION FASTENER IDENTIFICATION THREAD IDENTIFICATION SAE and metric bolt/nut threads are not the same. The difference is described in the Thread Notation chart (Fig. 5). GRADE/CLASS IDENTIFICATION The SAE bolt strength grades range from grade 2 to grade 8. The higher the grade number, the greater the bolt strength Identification is determined by the line marks on the top of each bolt head. The actual bolt strength grade corresponds to the number of line marks plus 2. The metric strength classes are 9.8 and 12.9. The metric strength classes are 9.8 and 12.9. greater the bolt strength. Some metric nuts are imprinted with a single-digit strength class on the nut face. Refer to the Fastener Identification and Fastener Identification and Fastener Identification (Continued) 7. FASTENER IDENTIFICATION NS INTRODUCTION 5 GENERAL INFORMATION (Continued) 8. FASTENER STRENGTH 6 INTRODUCTION NS GENERAL INFORMATION (Continued) 8. FASTENER STRENGTH 6 INTRODUCTION S GENERAL INFORMATION (Continued) 8. FASTENER STRENGTH 6 INTRODUCTION NS GENERAL INFORMATION (Continued) 8. FASTENER STRENGTH 6 INTRODUCTION NS GENERAL INFORMATION (Continued) 8. FASTENER MAY RESULT IN COMPONENT DAMAGE OR PER- SONAL INJURY. Figure art, specifications and torque references in this Service Manual are identified in metric and SAE format. During any maintenance or repair procedures, it is important to salvage- able, a fastener of equivalent specification should be used. The metric system is based on quantities of one, ten, one hundred, one thousand and one million (Fig. 6). The following chart will assist in converting metric units to equivalent English and SAE units, or vise versa. Refer to the Conversion Chart to convert torque values listed in metric Newton- meters (N·m). Also, use the chart to convert between millimeters (mm) and inches (in.) TORQUE REFERENCES Individual Torque Charts appear at the end of many Groups. Refer to the Standard Torque Specifi- cations Chart for torque references not listed in the individual torque charts. Fig. 6 Metric Prefixes CONVERSION FORMULAS AND EQUIVALENT VALUES NS INTRODUCTION 7 GENERAL INFORMATION (Continued) 10. METRIC CONVERSION 8 INTRODUCTION NS GENERAL INFORMATION (Continued) 11. TORQUE SPECIFICATIONS NS INTRODUCTION 9 GENERAL INFORMATION (Continued) 12. INTRODUCTION SOLUTION SO (VIN) • Country Codes • Regulation Number • Regulation Number • Approval Number • Regulation Number • Approval Number (VIN) can be viewed through the windshield at the upper left cor- ner of the instrument panel next to the left A-pillar (Fig. 2). The VIN consists of 17 characters in a combination of letters and numbers that provide specific information about the vehicle. Refer to the VIN Decoding Information Table to interpret VIN code. VIN CHECK DIGIT To protect the consumer from theft and possible fraud the manufacturer is required to include a check Digit at the ninth position of the VIN. The check digit is used by the manufacturer and government agencies to verify the authenticity of the vehicle and official documentation. The formula to use the check digit is not released to the general public. BODY CODE PLATE LOCATION AND DECODING The Body Code Plate is located (Fig. 3) in the engine compartment on the radiator closure panel crossmember. There are seven lines of information on the body code plate. Lines 4, 5, 6, and 7 are not used to define service information. Information reads from left to right, starting with line 3 in the center of the plate to line 1 at the bottom of the plate. BODY CODE PLATE—LINE 3 DIGITS 1 THROUGH 12 Vehicle Order Number DIGITS 13, 14, AND 15 Open Space Fig. 1 E-Mark Label Fig. 2 VIN PLATE LOCATION NS/GS INTRODUCTION 1 13. DIGITS 16, 17, AND 18 Vehicle Shell Car Line • GSYH = Voyager/Grand Voyager LE FWD • GSYS = Voyager/Grand Voya = Premium • S = Special/Sport DIGITS 20 AND 21 Body Type • 52 = Short Wheel Base • 53 = Long Wheel Base BODY CODE PLATE-LINE 2 DIGITS 1,2, AND 3 Paint Procedure DIGIT 4 Open Space VIN DECODING INFORMATION POSITION INTERPRETATION CODE = DESCRIPTION 1 Country of origin 1 = United States or Austria 2 = Canada 2 Make C = Chrysler D = Dodge 3 Vehicle Type 4 = Multipurpose Pass. Veh. 4 Gross Vehicle Weight Rating G = 2268-2721 kg (5001-6000 lbs) 5 Car Line C = Voyager/Grand Voyager FWD 6 Series 4 = Voyager/Grand Voyager/Grand Voyager/Grand Voyager FWD 6 Series 4 = Voyager/Grand Voyager/Gr Manual Transmission B = 4-Speed Automatic Transmission 7 Body Style 2 = Short Wheelbase 4-Door 5 = Long Wheelbase Premium 4-Door 5 = Long W Diesel (Intercooler) R = 3.3 L 6 cyl. gas MPI L = 3.8 L 6 cyl. gas MPI 9 Check Digit See explanation in this section. 10 Model Year W = 1998 11 Assembly Plant B = St. Louis South, U.S.A. R = Windsor, Canada U = Graz, Austria 12 Build Sequence 6 Digit number assigned by assembly plant 2 INTRODUCTION NS/GS GENERAL INFORMATION (Continued) 14. DIGITS 5 THROUGH 8 Primary Paint See Group 23, Body for color codes. DIGITS 10 THROUGH 13 Secondary Paint DIGIT 14 Open Space DIGITS 20, 21, AND 22 Engine Code • ECB = 2.0L 4cyl 16 valve SOHC gasoline • EDZ = 2.4 L 4 cyl. 16 valve DOHC gasoline • ENC = 2.5 L 4 cyl. Turbo Diesel (Intercooler) • EGA = 3.3 L 6 cyl. gasoline • DGI = 41TE 4-speed Electronic Automatic Tran-saxle • DD3 = A-598 5-speed Manual Transaxle DIGIT 5 Market Code • B = 3.8 L 6 cyl. gasoline • EGH = 3.8 L 6 cyl. gasoline • EGH = 3.8 L 6 cyl. gasoline • EGH = 3.8 L 6 cyl. gasoline • DGI = 41TE 4-speed Electronic Automatic Tran-saxle • DD3 = A-598 5-speed Manual Transaxle DIGIT 5 Market Code • B = 3.8 L 6 cyl. gasoline • EGH = 3.8 L 6 cy International • M = Mexico DIGIT 6 Open Space DIGITS 7 THROUGH 23 Vehicle Identification Number (VIN) Refer to Vehicle Identification Number (VIN) Para- graph for proper breakdown of VIN code. IF TWO BODY CODE PLATES ARE REQUIRED The last code shown on either plate will be fol- lowed by END. When two plates are required, the last code space on the first plate will indicate contin- ued (CTD). When a second plate is required, the first four spaces of each line will not be used due to overlap of the plates. MANUFACTURER PLATE The Manufacturer Plate (Fig. 4) is located in the engine compartment on the radiator closure panel crossmember adjacent to the Body Code Plate. The plate contains five lines of information: 1. Vehicle Identification Number (VIN) 2. Gross Train Mass (GVM) 3. Gross Train Mass (GTM) 4. Gross Tr found by using the Group Tab Locator index at the front of this manual. If it is not clear which group contains the information needed, refer to the index at the back of this manual. If it is not clear which group contains the information needed maintenance to be performed when the vehicle is used for general trans- portation. Schedule - B, lists maintenance intervals for vehi- cles that are operated under the conditions. Where time and mileage are listed, follow the interval that occurs first. PARTS AND LUBRICANT RECOMMENDATIONS When service is required, Chrysler Corporation recommends that only Mopar] brand parts, lubri- cants and chemicals be used. Mopar provides the best engineered products for servicing Chrysler Cor- poration vehicles. INTERNATIONAL SYMBOLS Chrysler Corporation uses international symbols to identify engine compartment lubricant and fluid inspection and fill locations (Fig. 1). CLASSIFICATION OF LUBRICANTS Only lubricants that are endorsed by the following organization should be used to service a Chrysler Corporation vehicle. • Society of Automotive Engineers (SAE) • American Petroleum Institute (API) (Fig. 2) • National Lubricating Grease Institute (NLGI) (Fig. 3) Fig. 1 International Symbols NS LUBRICATION AND MAINTENANCE 0 - 1 16. ENGINE OIL VISCOSITY An SAE viscosity grade is used to specify the vis- cosity of engine oil. SAE 30 specifies a single viscos- ity engine oil. Engine oils also have multiple viscosities. These are specified with a dual SAE vis- cosity grade which indicates the cold-to-hot tempera- ture viscosity range. • SAE 30 = single grade engine oil. • SAE 10W-30 = multiple grade engine oil. approvide. The API Service Grade specifications also apply to energy con- serving engine oils. Use engine oils that are API Service Certified. 5W-30 and 10W-30 MOPAR engine oils conform to specifications. Refer to Group 9, Engine oils conform to specification defines the lubricants usage. LUBRICANTS AND GREASES Lubricating grease is rated for quality and usage by the NLGI. All approved products have the NLGI symbol is the usage and quality identification letters. Wheel bearing lubricant is identified by the letter "G". Chassis lubricant is identified by the needed, refer to the index at the back of this manual. There are two maintenance schedules that show proper service based on the conditions that the vehi- cle is subjected to. Schedule - A, lists maintenance intervals for vehi- cles that are operated under the conditions listed at the beginning of the Maintenance Schedule section. Use the schedule that best describes your driving conditions. Where time and mileage are listed, follow the interval that occurs first. UNSCHEDULED INSPECTION At Each Stop for Fuel • Check engine oil level, add as required. • Check windshield washer solvent and add if required. Once a Month • Check tire pressure and look for unusual wear or damage. • Inspect battery and clean and tighten terminals as required. • Check all lights and all other electrical items for correct operation. Check rubber seals on each side of the radiator for proper fit. At Each Oil Change • Inspect exhaust system. • Inspect the CV joints and front suspension com- ponents • Rotate the tires at each oil change interval shown on Schedule - B (6,000 miles). • Check the coolant level, hoses, and clamps. • If your mileage is less than 7,500 miles (12 000 km) yearly, replace engine oil filter on 2.4L engines. SCHEDULE - A 7,500 Miles (12 000 km) or at 6 months • Change engine oil. 15,000 Miles (24 000 km) or at 12 months • Change engine oil. filter. 22,500 Miles (36 000 km) or at 18 months • Change engine oil. • Change engine oil. • Change engine oil filter. • Replace engine en oil. 45,000 Miles (72 000 km) or at 36 months • Change engine oil. • Replace engine oil filter. • Inspect brake linings. • Flush and replace engine coolant if not done at 36 months. 60,000 Miles (96 000 km) or at 48 months • Change engine oil. • Replace engine oil filter. • Replace engine oil. • Inspect tie rod ends and boot seals. 67,500 Miles (108 000 km) or at 54 months • Change engine oil. • Inspect brake linings. 75,000 Miles (120 000 km) or at 60 months • Change engine oil. • Replace engine oil filter. • Inspect serpentine drive belt, replace engine drive belt, replace 000 km) or at 66 months • Change engine oil. • Flush and replace engine coolant if it has been 30,000 miles (48 000 km) or 24 months since last change. 90,000 Miles (144 000 km) or at 72 months • Change engine oil. • Replace engine engine oil. • Replace engine engine oil. • Replace eng changed. * • Inspect serpentine drive belt, replace if neces- sary. This maintenance is not required if belt was previously replaced. • Inspect tie rod ends and boot seals. • Inspect brake linings. 97,500 Miles (156 000 km) or at 78 months • Change engine oil. 100,000 Miles (160,000 km) • Replace spark plugs on 3.3L and 3.8L engines. • Replace ignition cables on 3.3L and 3.8L engines. 105,000 Miles (168 000 km) or at 84 months • Change engine oil. • Replace engine oil filter. • Inspect serpentine drive belt, replace if neces- sary. This maintenance is not required if belt was previously replaced. • Flush and replace engine coolant if it has been 30,000 miles (48 000 km) or 24 months since last change. 112,500 Miles (180 000 km) or at 90 months • Change engine oil. • Inspect brake linings. • Flush and replace engine coolant if it has been 30,000 miles (48 000 km) or 24 months since last change. 120,000 Miles (192 000 km) or at 96 months • Change engine oil. • Replace engine oil filter. • Replace automatic transmission fluid. • Replace engine air cleaner element. • Check and replace PCV valve, if necessary. * • Inspect tie rod ends and boot seals. * This maintenance is recommended by Chrysler to the owner but is not required to maintain the war- ranty on the PCV valve. ** If California vehicle, this maintenance is recom- mended by Chrysler to the owner but is not required to maintain the warranty of the timing belt. SCHEDULE - B 3,000 Miles (10 000 km) • Change engine oil. • Inspect brake linings belt. SCHEDULE - B 3,000 Miles (10 000 km) • Change engine oil. • Inspect brake linings belt. 12,000 Miles (19 000 km) • Change engine oil. • Replace engine oil filter. 15,000 Miles (24 000 km) • Change engine oil. • Inspect air cleaner element. Replace as necessary. 0 - 4 LUBRICATION AND MAINTENANCE NS GENERAL INFORMATION (Continued) 19. • Drain and refill automatic transmission fluid and replace filter. Adjust bands, if so equipped. (See note) • Change AWD powertransfer fluid unit. 18,000 km) • Change engine oil. • Replace engine oil filter. • Inspect brake linings. 21,000 Miles (38 000 km) • Change engine oil. • Replace engine oil filter. • Inspect brake linings. 21,000 Miles (38 000 km) • Change engine oil filter. • Inspect brake linings. 21,000 Miles (38 000 km) • Change engine oil filter. (43 000 km) • Change engine oil. • Inspect PCV valve. Replace as necessary. * • Drain and refill automatic transmission fluid and replace filter. • Adjust bands, if so equipped. (See note) • Change AWD power transfer unit fluid. • Inspect tie rod ends and boot seals. 33,000 Miles (53 000 km) • Change engine oil. 42,000 Miles (58 000 k rear car- rier fluid. 45,000 Miles (72 000 km) • Change engine oil. • Inspect air cleaner element. Replace as necessary. • Drain and refill automatic transmission fluid and replace filter. Adjust bands, if so equipped. (See note) • Inspect brake linings. • Change engine oil. • Replace engine oil filter. 51,000 Miles (82 000 km) • Change engine oil. • Flush and replace engine colant. 54,000 Miles (91 000 km) • Change engine oil. • Replace engine oil. • Replace engine oil. • Replace air cleaner element. Inspect PCV valve, replace if necessary. * • Inspect serpentine drive belt, replace if neces- sary. • Drain and refill automatic transmission fluid. • Inspect tie rod ends and boot seals. 63,000 Miles (101 000 km) • Change engine oil. • Change AWD overrunning clutch and rear car- rier fluid. • Inspect brake linings. 66,000 Miles (120 000 km) • Change engine oil. • Replace engine oil. • Replace engine oil. • Replace engine oil. • Inspect brake linings. 75,000 Miles (120 000 km) • Change engine oil. • Inspect at cleaner element. Replace as necessary. NS LUBRICATION AND MAINTENANCE 0 - 5 GENERAL INFORMATION (Continued) 20. • Replace spark plugs. • Replace ignition cables. • Inspect serpentine drive belt, replace if neces- sary. This maintenance is not required if belt was previously replaced. • Drain and refill automatic transaxle fluid and replace filter. Adjust band, if so equipped. (See note) • Change engine oil. • Replace engine oil. • Inspect brake linings. • Flush and replace engine oil. • Replace engine eng filter. • Change AWD overrunning clutch and rear car- rier fluid. 87,000 Miles (139 000 km) • Change engine oil. 90,000 Miles (144 000 km) • Change engine oil. 90,000 sary. This maintenance is not required if belt was previously replaced. • Drain and refill automatic transmission fluid and replace filter. Adjust bands, if so equipped. (See note) • Change AWD power transfer unit fluid. • Inspect tie rod ends and boot seals. • Inspect brake linings. 93,000 Miles (149 000 km) • Change engine oil. 96,000 Miles (154 000 km) • Change engine oil. • Replace engine oil filter. 105,000 Miles (168 000 km) • Change engine oil. • Inspect air cleaner element. Replace as necessary. • Inspect serpentine drive belt, replace if neces- sary. This maintenance is not required if belt was previously replaced. • Drain and refill automatic transmission fluid. • Change AWD overrunning clutch and rear car- rier fluid. 108,000 Miles (173 000 km) • Change engine oil. • Replace engine oil filter • Inspect brake linings. 111,000 Miles (178 000 km) • Change engine oil. • Flush and replace engine oil. • Rep cleaner element. • Inspect PCV valve. Replace as necessary. * • Inspect serpentine drive belt. Not required if replaced at 75,000, 90,000 or 105,000 miles. • Change AWD power transfer unit fluid. • Inspect tie rod ends and boot seals. * This maintenance is recommended by Chrysler to the owner but is not required to maintain the war-ranty of the timing belt. NOTE: Operating vehicle more than 50% in heavy traffic during hot weather, above 90°F (32°C), using vehicle for police, taxi, limousine type operation or trailer towing require the more frequent transaxle service noted in Schedule - B. Perform these con- ditions. Inspection and service should also be performed anytime a malfunction is observed or suspected. 0 - 6 LUBRICATION AND PROCEDURE WARNING: REVIEW ALL SAFETY PRECAUTIONS AND WARNINGS IN GROUP 8A, BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. DO NOT JUMP START A FROZEN BATTERY/START- ING/CHARGING SYSTEMS DIAGNOSTICS. COLOR. DO NOT JUMP START A VEHICLE WHEN THE BATTERY FLUID IS BELOW THE TOP OF LEAD PLATES. DO NOT ALLOW JUMPER CABLE CLAMPS TO TOUCH EACH OTHER WHEN CONNECTED TO A BOOSTER SOURCE. DO NOT USE OPEN FLAME NEAR BAT-TERY. REMOVE METALLIC JEWELRY WORN ON HANDS OR WRISTS TO AVOID INJURY BY ACCI- DENTAL ARCING OF BATTERY CURRENT. WHEN USING A HIGH OUTPUT BOOSTING DEVICE, DO NOT ALLOW BATTERY VOLTAGE TO EXCEED 16 VOLTS. REFER TO INSTRUCTIONS PROVIDED WITH DEVICE BEING USED. CAUTION: When using another vehicle as a booster, do not allow vehicles to touch. Electrical systems can be damaged on either vehicle. TO JUMP START A DISABLED VEHICLE: (1) Raise hood on disabled vehicle and visually inspect engine compartment for: • Battery cable clamp condition, clean if necessary. • Frozen battery. tension. • Fuel fumes or leakage, correct if necessary. CAUTION: If the cause of starting problem on dis- abled vehicle is severe, damage to booster vehicle within cable reach. Turn off all accessories, set the parking brake, place the automatic transmission in PARK or the manual transmission in NEUTRAL and turn the ignition OFF. (3) On disabled vehicle, place gear selector in park or neutral and set park brake. Turn off all accesso- ries. (4) Connect jumper cables to booster battery. RED clamp to positive terminal (+). BLACK clamp to neg- ative terminal (-). DO NOT allow clamps at opposite end of cables to touch, electrical arc will result. Review all warnings in this procedure. (5) On disabled vehicle, connect RED jumper cable clamp to engine ground as close to the ground as close to the ground cable attaching point as possible (Fig. 1). (6) Start the engine in the vehicle which has the booster battery, let the engine idle a few minutes, then start the engine in the vehicle for more than 15 seconds, starter will over- heat and could fail. (7) Allow battery in disabled vehicle to charge to at least 12.4 volts (75% charge) before attempting to start engine. If engine does not start within 15 sec- onds, stop cranking engine and allow starter to cool (15 min.), before cranking again. Fig. 1 Jumper Cable Clamps Connect BLACK cable clamp from engine ground on disabled vehicle. When using a Booster vehicle, disconnect BLACK cable clamp from battery posi- tive terminal. • Disconnect RED cable clamp from battery posi- tive terminal. • Disconnect RED cable clamp from battery posi- tive terminal. • Disconnect RED cable clamp from battery posi- tive terminal. MENT DEVICES TO CONTACT THE FUEL TANK OR LINES, FUEL LEAK CAN RESULT. DO NOT LIFT OR TOW VEHICLE BY FRONT OR REAR BUMPER, OR BUMPER ENERGY ABSORBER UNITS. DO NOT GO UNDER A LIFTED VEHICLE IF NOT SUPPORTED PROPERLY ON SAFETY STANDS. DO NOT ALLOW PASSENGERS TO RIDE IN A TOWED VEHICLE. USE A SAFETY CHAIN THAT IS INDEPENDENT FROM THE TOWING ATTACHMENT DEVICE. CAUTION: Do not damage brake lines, exhaust sys- tem, shock absorbers, sway bars, or any other under vehicle components when attaching towing device to vehicle. Do not attach towing device to front or rear sus- pension components. Do not secure vehicle to towing device by the use of front or rear suspension or steering components. Remove or secure loose or protruding objects from a damaged vehicle to bear on lower fascia, air dams, or spoilers. RECOMMENDED TOWING EQUIPMENT To avoid damage to bumper fascia and air dams use of a flat bed towing device, be sure the disabled vehicle has at least 100 mm (4 in.) ground clearance. If minimum ground clearance cannot be reached, use a towing dolly. If a flat bed device is used, the approach angle should not exceed 15 degrees. GROUND CLEARANCE CAUTION: If vehicle is towed with wheels removed, install lug nuts to retain brake drums or rotors. A towed vehicle should be raised until the lifted wheels are a minimum 100 mm (4 in.) from the ground. Be sure there is at least 100 mm (4 in.) clearance between the tail pipe and the ground. If necessary, remove the wheels from the lifted end of the vehicle and lower the vehicle closer to the ground, to increase the ground, to increase the ground clearance at the rear of the vehicle. Install lug nuts on wheel attaching studs to retain brake drums or rotors. LOCKED VEHICLE TOWING When a locked vehicle must be towed with the front wheels on the ground, use a towing dolly or flat bed hauler. FLAT TOWING WITH TOW BAR • 3-speed automatic transaxle vehicles can be flat towed at speeds not to exceed 40 km/h (25 mph) for not more than 25 km (15 miles). The steering column must be unlocked and gear selector in neutral. • 4-speed electronic automatic transaxle vehicles can be flat towed at speeds not to exceed 72 km/h (44 mph) for not more than 160 km (100 miles). The steering column must be unlocked and gear selector in neutral. FLAT BED TOWING TIE DOWNS CAUTION: Do not tie vehicle down by attaching chains or cables to suspension components or engine mounts, damage to vehicle can result. NS vehicles can be tied to a flat bed device using the reinforced loops located under the front and rear bumpers on the drivers side of the vehicle. There are also four reinforced loops located on the bottom of the front frame rail torque Fig. 2 Recommended Towing Devices 0 - 8 LUBRICATION AND MAINTENANCE NS SERVICE PROCEDURES (Continued) 23. boxes behind the front wheels and forward of the rear wheels inboard of the rocker panel weld seam. TOWING—FRONT WHEEL LIFT Chrysler Corporation recommends that a vehicle be towed with the front end lifted, whenever possible. A 90 cm (36 in.) length of 4x4 wood beam can be placed between the wheel lift device and the bottom of the fascia to prevent damage to vehicle during the lifting operation. The beam can removed after lifting the front of the vehicle. TOWING-REAR WHEEL LIFT If a vehicle cannot be towed with the front wheels lifted, the rear wheels can be lifted provided the fol-lowing guide lines are observed. CAUTION: Do not use steering column lock to secure steering wheel during towing operation. • On AWD vehicles, all four wheels must be free to rotate. Use towing dollies at unlifted end of vehicle. • Unlock steering wheel in straight ahead position with a clamp device designed for towing. • 3-speed automatic transaxle vehicles can be flat towed at speeds not to exceed 40 km/h (25 mph) for not more than 25 km (15 miles). The steering column must be unlocked and gear selector in neutral. • 4-speed electronic automatic transaxle vehicles can be flat towed at speeds not to exceed 72 km/h (44 mph) for not more than 160 km (100 miles). The steering column must be unlocked and gear selector in neutral. HOISTING RECOMMENDATIONS Refer to Owner's Manual provided with vehicle for proper emergency jacking procedures. WARNING: THE HOISTING AND JACK LIFTING POINTS PROVIDED ARE FOR A COMPLETE VEHI- CLE. WHEN THE ENGINE OR REAR SUSPENSION IS REMOVED FROM A VEHICLE, THE CENTER OF GRAVITY IS ALTERED MAKING SOME HOISTING CONDITIONS UNSTABLE. PROPERLY SUPPORT OR SECURE VEHICLE TO HOISTING DEVICE WHEN THESE CONDITIONS EXIST. CAUTION: Do not position hoisting device on sus- pension components or front crossmember, dam- age to vehicle can result. TO HOIST OR JACK VEHICLE SEE (Fig. 3). Vehicles with factory installed ground effects are equipped with front and rear hoisting pads. These pads are stamped, "Hoist Point". Fig. 3 HOISTING AND JACKING POINTS NS LUBRICATION AND MAINTENANCE 0 - 9 SERVICE PROCEDURES (Continued) 24. LUBRICATION AND MAINTENANCE 0 - 9 SERVICE PROCEDURES (Continued) 24. LUBRICATION AND MAINTENANCE 0 - 9 SERVICE PROCEDURES (Continued) 24. LUBRICATION AND MAINTENANCE CONTENTS page page GENERAL INFORMATION engine oils, it is recommended that SAE Grade 5W-30 engine oils that meet Chrysler material standard MS-6395, be used. SAE Grade 10W-30 oils are also acceptable when the temperatures do not fall below 0°C. In areas where these grades are not generally available, higher SAE grades may be used. Lubricants which have both an SAE grade number and the proper API service classification shown on the container should be used. ENGINES Use only Diesel Engine Oil meeting standard MIL- 2104C or API classification SG/CD or CCMC PD2. SAE VISCOSITY GRADE CAUTION: Low viscosity oils must have the proper API quality or the CCMC G5 designation. To assure of properly formulated engine oils, it is recom- mended that SAE Grade 15W-40 engine oils that meet Chrysler material standard MS-6395, be used. European Grade 10W-40 oils are also acceptable. Oils of the SAE 5W-30 or 10W-30 grade number are preferred when minimum temperatures consis- tently fall below -12°C. MANUAL L 2.0L Gasoline Engine Cooling System* 6.0L 2.5L VM Diesel Engine Cooling System* 10.0 L Transmission—5-Speed Manual 2.2 L * Includes heater and coolant recovery tank filled to Max level. Add 2.76L if equipped with Rear Heater. NS/GS LUBRICATION AND MAINTENANCE 0 - 1 25. MAINTENANCE SCHEDULES INDEX page page GENERAL INFORMATION MAINTENANCE SCHEDULE ______ 2 SCHEDULE ______ 2 SCHEDULE ______ 2 SCHEDULE ______ 2 GENERAL INFORMATION MAINTENANCE SCHEDULE Refer to the 1998 GS Service Manual for Gasoline Engine and non-engine related Maintenance Sched- ules. MAINTENANCE SCHEDULE-DIESEL ENGINE The following are engine related Maintenance items which are unique to Diesel engine-equipped vehicles. Refer to the 1998 GS Service Manual for Gasoline Engine and non-engine related Maintenance Schedules. The service intervals are based on odometer read- ings in kilometers. There are two maintenance sched- ules that show proper service intervals. Use the schedule that best describes the conditions the vehi- cle is operated under. performed under normal operating conditions. • Stop and go driving. • Long periods of engine idling. • Driving in dusty conditions. • Short trips of less than 5 miles. • Operation at sustained high speeds during hot weather above 32°C (90°F). • Taxi, police or delivery service. • Trailer towing. UNSCHEDULED INSPECTION At Each Stop for Fuel • Check windshield washer solvent and add if required. • Check windshield washer solvent and add if required. and tighten terminals as required. • Check fluid levels of coolant reservoir, brake master cylinder, power steering and transaxle and add as needed. • Check rubber seals on each side of the radiator for proper fit. At Each Oil Change • Inspect exhaust system. • Inspect brake hoses • Inspect the CV joints and front suspension com- ponents • Rotate the tires at each oil change interval shown on Schedule—B (6,000 miles). • Check the coolant level, hoses, and clamps. • If your mileage is less than 7,500 miles (12 000 km) yearly, replace the engine oil filter at each oil change. • Replace engine oil filter. SCHEDULE-A (DIESEL) 1 000 KM • Change engine oil. • Check correct torque, exhaust manifold mounting nuts. • Check correct torque, intake manifold mounting nuts. • Check correct torque, exhaust manifold mounting nuts. • Check correct torque, exhaust manifold mount-ing nuts. • Check correct torque, exhaust manifold mounting nuts. bolts. 10 000 KM • Change engine oil. • Change engine oil. • Change engine oil. • Change engine oil filter. 40 000 KM • Change engine oil filter. 40 000 KM • Change engine oil filter. oil. • Change engine oil filter. • Replace air filter element. • Check glow plug operation. • Check glow plug operation. • Change engine oil. • Change engine oil filter. • Replace air filter element. • Check glow plug operation. • Replace fuel filter. drive belt. • Check engine smoke. • Replace engine coolant. 70 000 KM • Change engine oil. • Change engine oil filter. • Replace air filter element. • Check drive belt tension. • Check glow plug operation. • Replace fuel filter/water separator element.** 90 000 KM • Change engine oil. • Change engine o Change engine oil filter. 100 000 KM • Change engine oil filter. • Check drive belt tension. • Check drive belt te driven less than 40 000 km annually or if power loss from fuel star- vation is detected. EVERY 10 000 KM + Change engine oil. • Change engine oil filter. • Replace air filter element. • Check drive belt tension. • Check glow plug operation. SCHEDULE—B (DIESEL) 500 KM • Check correct torque, intake manifold mounting nuts. • Check correct torque, exhaust manifold mount- ing nuts. • Check correct torque, exhaust manifold mounting nuts. • Check correct torque, exhaust manifold mount- ing engine oil. • Change engine oil filter. 10 000 KM • Change engine oil. • Change engine oil filter. • Replace air filter element. • Check drive belt tension. • Check glow plug operation. 25 000 KM • Change engine oil. • C smoke. • Replace engine collant. 35 000 KM • Change engine oil filter. • Change engine engine oil. • Change engine oil filter. 50 000 KM • Change engine oil. • tension. • Check glow plug operation. • Change engine oil filter. 70 000 KM • Change engine oil filter. • Replace air filter element. • Check drive belt tension. • Check glow plug operation. • Change engine oil filter. • Replace air filter element. • Change engine oil filter. • Replace fuel filter/water separator element. • Change engine oil filter. • Replace air filter element. • Check drive belt tension. • Change engine oil filter. • Replace fuel filter

engine oil. • Change engine oil filter. 80 000 KM • Change engine oil. • Change engine oil filter. • Replace engine oil filter. • Replace engine oil filter. • Replace engine oil. • Change engine oil. • Change engine oil filter. Replace air filter element. • Check drive belt tension. • Check glow plug operation. 95 000 KM • Change engine oil filter. 100 000 KM • Change engine oil filter. • Replace fuel filter. • Replace fuel filter. element. • Change MTX fluid EVERY 5 000 KM AFTER 100 000 KM • Change engine oil. • Change engine oil filter. EVERY 10 000 KM • Diesel engine oil filter. • Replace air filter element. • Check drive belt tension. • Check glow plug operation. EVERY 20 000 KM • Diesel engine oil. PROCEDURES TOWING RECOMMENDATIONS WARNINGS AND CAUTIONS WARNING: DO NOT ALLOW TOWING ATTACH- MENT DEVICES TO CONTACT THE FUEL TANK OR LINES, FUEL LEAK CAN RESULT. DO NOT LIFT OR TOW VEHICLE BY FRONT OR REAR BUMPER, OR BUMPER ENERGY ABSORBER UNITS. DO NOT GO UNDER A LIFTED VEHICLE IF NOT SUPPORTED PROPERLY ON SAFETY STANDS. DO NOT ALLOW PASSENGERS TO RIDE IN A TOWED VEHICLE. USE A SAFETY CHAIN THAT IS INDEPENDENT FROM THE TOWING ATTACHMENT DEVICE. CAUTION: Do not damage brake lines, exhaust sys- tem, shock absorbers, sway bars, or any other under vehicle components when attaching towing device to vehicle. Do not attach towing device to front or rear suspension or steering components. Remove or secure loose or protruding objects from a damaged vehicle before towing. Refer to state and local rules and regulations before towing a vehicle. Do not allow weight of towed vehicle to bear on lower fascia, air dams, or spoilers. RECOMMENDED TOWING EQUIPMENT To avoid damage to bumper fascia, air dams, or spoilers. RECOMMENDED TOWING EQUIPMENT To avoid damage to bumper fascia and air dams use of a flat bed towing device or wheel lift (Fig. 1) is recommended. at least 100 mm (4 in.) ground clearance. If minimum ground clearance cannot be reached, use a towing dolly. If a flat bed device is used, the approach angle should not exceed 15 degrees. GROUND CLEARANCE CAUTION: If vehicle is towed with wheels removed, install lug nuts to retain brake drums or rotors. A towed vehicle should be raised unti the lifted wheels are a minimum 100 mm (4 in.) from the ground. Be sure there is at least 100 mm (4 in.) clearance between the tail pipe and the ground. If necessary, remove the wheels from the lifted end of the vehicle closer to the ground. If necessary, remove the wheels from the lifted end of the vehicle. Install lug nuts on wheel attaching studs to retain brake drums or rotors. LOCKED VEHICLE TOWING WITH TOW BAR • 4-speed electronic automatic transaxle vehicles can be flat towed at speeds not to exceed 72 km/h (44 mph) for not more than 160 km (100 miles). The steering column must be unlocked and gear selector in neutral. FLAT BED TOWING TIE DOWNS CAUTION: Do not tie vehicle down by attaching chains or cables to suspension components or engine mounts, damage to vehicle can result. Fig. 1 Recommended Towing Devices NS/GS LUBRICATION AND MAINTENANCE 0 - 5 29. NS vehicles can be tied to a flat bed device using the reinforced loops located under the front and rear bumpers on the drivers side of the vehicle. There are also four reinforced loops located under the front and rear wheels inboard of panel weld seam. TOWING—FRONT WHEEL LIFT Chrysler International recommends that a vehicle be towed with the front end lifted, whenever possible. A 90 cm (36 in.) length of 4x4 wood beam can be placed between the wheel lift device and the bottom of the fascia to prevent damage to vehicle during the lifting operation. The beam can removed after lifting the front of the vehicle. TOWING-REAR WHEEL LIFT If a vehicle cannot be towed with the front wheels lifted, the rear wheels can be lifted provided the fol- lowing guide lines are observed. CAUTION: Do not use steering wheel during towing operation. • On AWD vehicles, all four wheels must be free to rotate. Use towing dollies at unlifted end of vehicle. • Unlock steering column and secure steering column must be flat towed at speeds not to exceed 72 km/h (44 mph) for not more than 160 km (100 miles). The steering column must be unlocked and gear selector in neutral. TOWING—TOW HOOKS WARNING: Do not use the tow hook to lift the vehi- cle off the ground. A tow-hook bolt, located in the rear interior trim storage compartment (with jack), is provided with your vehicle. The tow hook is used for towing the vehicle with all four wheels on the ground only. It can be attached to the vehicle through an opening in the lower front fascia. The tow hook must be fully seated to the attach bracket through the lower front fascia as shown. If the tow hook is not fully seated to the attach bracket prior to bolt CHECK AND ADJUSTMENT PROCEDURE 4 SPECIFICATIONS ALIGNMENT SPECIFICATIONS ALIGNMENT SPECIFICATIONS ALIGNMENT SPECIFICATIONS AND OPERATION Wheel alignment is the proper adjustment of all the interrelated suspension angles affecting the run- ning and steering of the front and rear wheels of the vehicle. The method of checking front and rear wheel align- ment will vary depending on the type of equipment being used. The instructions furnished by the manu- facturer of the equipment should always be used. The Chrysler Corporation recom- mended alignment specifications, are listed in Speci- fications at the end of this group in the service manual section. There are vehicle height, caster, camber, toe-in, steering axis inclina- tion and toe-out on turns. Of the six basic factors only toe-in is normally mechanically adjustable on this vehicle (Fig. 1). NS SUSPENSION 2 - 1 31. Camber adjustment is allowed in the event that a vehicle is involved in an accident and after repairs are made meeting manufacturers tolerance specifica- tions, the camber setting will not meet manufactur- ers specifications. If camber adjustment is required, refer to the following Service Camber Adjustment Procedure for the required steps to be followed. CAUTION: Do not attempt to modify any suspen- sion or steering components to meet vehicle align- ment specifications, by heating and or bending. Alignment checks and adjustments should be made in the following sequence. (1) Camber (2) Toe Camber is the number of degrees the top of the wheel and tire assembly is tilted inboard from a true vertical line. Inboard tilt is negative camber causes wear on the inside of the tires tread surface, while positive camber causes wear to the outside of the tires tread surface. See Front Wheel Drive Specifications for Camber. settings. Toe is measured in degrees or inches and is the distance the front edges. See Front Wheel Drive Specifications for Toe. settings. Fig. 1 Front Suspension Alignment Angles 2 - 2 SUSPENSION NS DESCRIPTION AND OPERATION (Continued) 32. DIAGNOSIS AND TESTING SUSPENSION AND STEERING DIAGNOSIS CONDITION POSSIBLE CAUSES CORRECTION Front End Whine On Turns 1. Defective wheel bearing 2. Incorrect wheel alignment 2. Check and reset wheel alignment 3. Worn tires 3. Replace tires Front End Growl Or Grinding On Turns 1. Defective wheel bearing 2. Engine mount grounding 2. Check for motor mount hitting frame rail and reposition engine as required 3. Worn or broken C/V joint 4. Loose wheel lug nuts 4. Verify wheel lug nut torque 5. Incorrect wheel alignment 5. Check and reset wheel alignment 6. Worn tires 6. Replace tires 7. Front strut pin in upper strut mount 7. Replace the front strut upper mount and bearing Front End Clunk Or Snap On Turns 1. Loose lug nuts 1. Verify wheel lug nut torque 2. Worn or broken C/V joint 2. Replace C/V joint 3. Worn or loose tie rod 3. Tighten or replace tie rod end 4. Worn or loose ball joint 4. Tighten or replace ball joint 5. Worn/loose control arm bushing 5. Replace control arm bushing 6. Loose stabilizer bar. 6. Tighten strut attachment to specified torque 8. Loose crossmember bolts 8. Tighten crossmember bolts to specified torque Front End Whine With Vehicle Going Straight At A Constant Speed 1. Defective wheel bearing 1. Replace transaxle gears or bearings 4. Replace transaxle gears or bearings 4. Replace transaxle gears or bearing 3. Replace transaxle gears or bearing 4. Replace transaxle gears or bearing 4. Replace transaxle gears or bearing 4. Replace transaxle gears or bearing 5. At A Constant Speed 1. Engine mount grounding 1. Replace C/V joint 2. Replace transaxle gears or bearings Front End Whine When Accelerating Or Decelerating 1. Worn or broken engine mount 1. Replace engine mount 2. Worn or bearings 3. Loose lug nuts 3. Verify wheel lug nut torque 4. Worn or loose ball joint 5. Tighten or replace ball joint 5. Worn or loose control arm bushing 6. Replace control arm bushing 7. Loose crossmember bolts 7. Tighten crossmember bolts to specified torque 8. Worn tie rod end 8. Replace tie rod end NS SUSPENSION 2 - 3 33. CONDITION POSSIBLE CAUSES CORRECTION Road Wander 1. Incorrect tire pressure 1. Inflate tires to recommended pressure 2. Incorrect front or rear wheel toe 2. Check and reset wheel toe 3. Worn wheel bearings 3. Replace wheel bearing 4. Worn control arm bushings 4. Replace control arm bushing 5. Excessive friction in steering gear 5. Replace steering gear 5. Replace steering gear 6. Excessive friction in steering gear 5. Replace steering gear 6. Excessive friction in steering shaft coupling 6. Replace steering gear 5. Replace steering gear 6. Excessive friction in steering gear 5. Replace steering gear 6. Excessive friction in steering gear 5. Replace steering gear 6. Excessive friction in steering gea Inflate all tires to recommended pressure 2. Radial tire lead 2. Perform lead correct front wheel camber 3. Check and reset front wheel camber 4. Replace power steering gear 5. Wheel braking 5. Correct b Steering Gear Adjustment 1. Adjust Or Replace Steering Gear 2. Worn or loose tie rod ends 3. Loose steering gear mounting bolts 3. Tighten steering shaft coupler 4. Replace steering gear bolts to specified torque 4. Loose or worn steering shaft coupler 4. Replace steering shaft coupler 4. Replace steering gear mounting bolts 3. Tighten steering gear bolts to specified torque 4. Loose or worn steering shaft coupler 4. Replace steering steering shaft coupler 4. Replace steering to recommended pressure 2. Lack of lubricant in steering gear 3. Low power steering fluid level 3. Fill power steering fluid reservoir to correct level 4. Correctly adjust power steering gear 3. Low power steering fluid reservoir to correct level 4. Loose power steering fluid re malfunction 6. Replace steering gear 7. Lack of lubricant in steering coupler 7. Replace steering coupler PRE-WHEEL ALIGNMENT INSPECTION Before any attempt is made to change or correct the wheel alignment factors. The following part inspection and the necessary corrections should be made to those parts which influence the steering of the vehicle. (1) Check and inflate all tires to recommended pressure. All tires should be the same size and in good condition and have approximately the same wear. Note the type of tread wear which will aid in diagnosing, see Wheels and Tires, Group 22. (2) Check front wheel and tire assembly for radial runout. (3) Inspect lower ball joints and all steering link- age for looseness. (4) Check for broken or sagged front and rear springs. (5) Check vehicle ride height to verify it is within specifications. (6) Alignment MUST only be checked after the vehicle has the following areas inspected and or adjusted. Recommended tire pressures, full tank of fuel, no passenger or luggage compartment load and is on a level floor or a properly calibrated alignment rack. SERVICE PROCEDURES WHEEL ALIGNMENT CHECK AND ADJUSTMENT PROCEDURE CASTER AND CAMBER Front suspension Caster and Camber settings on this vehicle are determined at the time the vehicle is designed. This is done by determining the precise 2 - 4 SUSPENSION NS DIAGNOSIS AND TESTING (Continued) 34. mounting location of the vehicle's suspension compo- nents throughout the design and assembly processes of the vehicle and results in no normal requirement to adjustment the Caster and Camber after a vehicle is built or when servicing the suspension components. Thus Caster and Camber are not normally considered an adjust- able specification when performing an alignment on this vehicle. Though Caster and Camber are not adjustable they should be checked during the align- ment procedure to ensure they meet the manufactur- ers specifications. If front camber does not meet the vehicle align- ment specifications, it can be adjusted using a Mopar Service Kit developed to allow for camber adjust- ment. If a vehicle's front camber does not meet required specifications, the vehicles suspension com- ponents should be inspected for any signs of damage or bending and the vehicle ride height should be checked to verify it is within required specification. This inspection must be done before using the Wopar Service Kit for setting camber to the vehicle specification. CAUTION: Do not attempt to adjust the vehicle specification to the vehicle on the alignment rack. Then install all required alignment equipment on the vehicle, per the alignment manu- facturers specifications. NOTE: Prior to reading each alignment specifications. NOTE: Prior to reading each alignment manu- facturers specifications. end of vehicle an equal number of times. Bumper should always be released when vehicle's current front and rear alignment settings. Compare the vehicle's current alignment settings to the vehicle specifications for camber, caster and Toe- in. See Alignment Specifications in this group of the service manual for the required specifications. If front and rear camber readings are within specifications refer to step Step 3 for the Toe-in adjustment procedure if required. dure. CAMBER ADJUSTMENT CAM BOLT PACKAGE INSTALLATION PROCEDURE (1) If the front camber readings obtained are not within the vehicle's specifications, use the following procedure and the Mopar Clevis Bolt Service Kit to provide camber adjustment. The kit contains 2 flange bolts, 2 cam bolts, and 2 dog bone washers. These components of the service kit are necessary to assem- ble the strut to the steering knuckle, after modifica- tion of the strut clevis bracket. (2) Verify that the strut and steering knuckle are not bent or otherwise damaged. If either component is bent or show other signs of damage, replace required component(s) and check the camber setting again Refer to Strut Damper Assembly Service in this group of the service manual for the required strut replacement procedure. (3) If no component is bent or damaged, use the following procedure for modifying the strut clevis bracket and adjusting the vehicle. There are not sup- porting the vehicle until tires are not sup- porting the vehicle. remove wheel and tire assembly from the location on the vehicle requiring the strut to be modified. CAUTION: When removing the strut to be modified. CAUTION: When removing the strut to be modified. assembly. If necessary use a wire hanger to sup- port the steering knuckle assembly or if required remove the brake flex hose from the caliper assem- bly. CAUTION: The steering knuckle strut assembly attaching bolts are serrated and must not be turned during removal. Remove nuts while holding bolts attaching bolts are serrated and must not be turned during removal. the top and bottom, strut clevis bracket to steering knuckle attaching bolts (Fig. 2) and discard. Separate the steering knuckle from the strut clevis bracket, do not enlarge the hole beyond the indentations (Fig. 3) on the sides of the strut clevis bracket. NS SUSPENSION 2 - 5 SERVICE PROCEDURES (Continued) 35. (6) Using an appropriate grinder and grinding slot do not go beyond the indentation area on the sides of the clevis bracket (Fig. 3). CAUTION: After slotting the strut clevis bracket hole, do not install the original attaching bolts, cam bolts, cam bolts, cam bolts, cam bolts, cam bolts, cam bolts, and dog bone washers from the Mopar Clevis Bolt Service Kit, can be used to attach the steering knuckle to the strut after the mounting hole is slotted. (7) Install the flanged bolt (Fig. 4) from the Mopar Clevis Bolt Service Kit, into the top clevis bracket to steering knuckle mounting hole. (B) Install the original attach ing bolts onto the replacement bolts from the service kit. Tighten the bolts just enough to hold the steering knuckle in position when adjusting camber, while still allowing the steering knuckle to move in clevis bracket. (9) Lower vehicle until the full weight of the vehi- cle is supported by the vehicles' suspension. Then correctly jounce the front and rear of vehicle an equal amount of times. (10) Adjust the front camber to the preferred set- ting by rotating the lower eccentric cam bolt (Fig. 6) against the cam stop areas on the strut clevis bracket. When camber is correctly set, tighten the upper strut clevis bracket bolt and lower cam bolt. Again jounce front and rear of vehicle an equal amount of times and verify front camber setting. See Alignment Specifications in this group of the service manual for required specifications. Fig. 2 Clevis Bracket To Steering Knuckle Attaching Bolts Fig. 3 Strut Clevis Bracket To Steering Knuckle Attaching Bolts Fig. 3 Strut Clevis Bracket Bolt Hole Grinding Area Fig. 4 Mopar Service Kit Bolts Correctly Installed Fig. 5 Dog Bone Washer And Nuts Installed On Attaching Bolts 2 - 6 SUSPENSION NS SERVICE PROCEDURES (Continued) 36. (11) When vehicle is at correct camber setting torque both front strut to steering knuckle attaching bolts to 90 N·m (65 ft. lbs.) plus an additional 1/4 turn after required torque is met. (12) If Toe readings obtained are not within the required specification range, adjust Toe to meet the preferred specification setting. Toe is adjustable using the following Toe setting procedure. (2) Center steering wheel and lock in place using a steering wheel clamp. CAUTION: Do not twist front inner tie rod to steer-ing gear rubber boots during front wheel Toe adjustment. (3) Loosen front inner to outer tie rods at servations and rotate inner tie rods at servations. (4) Tighten tie rod jam nuts (Fig. 7) to 75 N·m (55 ft.lbs.) torque. (5) Adjust steering gear to tie rod boots at tie rod. (6) Remove steering wheel clamp. SPECIFICATIONS All alignment specifications listed in the following alignment specifications chart. Fig. 6 Camber Adjustment Cam Bolt Fig. 7 Front Wheel Toe Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber is adjustable using the Mopar Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERVICE PROCEDURES (Continued) 37. * Camber Adjustment NS SUSPENSION 2 - 7 SERV adjustable. If found to be out of specification check for proper ride heights and damaged/worn out suspension components and replace as necessary. *** Toe. In is positive. **** Toe. In is positive. **** Toe. The heights and damaged/worn out suspension components and replace as necessary. necessary. ***** When Measuring ride heights: 1) Ensure that the tire pressures are correct. 2) Jounce the vehicle at the bumper several times and release at the bottom of the stroke. 3) Measure from the ground to the outboard, lower, center section of the fender wheel well opening. Ride heights are not adjustable. If found to be out of specification check for damaged and/or worn out suspension components and replace as necessary. ALIGNMENT ANGLE TIRE SIZES TIRE SIZES ALTERNATIVE FUELS P205/75/R15 C.N.G. P215/65/R16 ELECTRIC * FRONT INDIVIDUAL CAMBER IN DEGREES..... ... 0.00° - 0.50° MAX 0.00° - 0.50° MAX 0.00° - 0.50° MAX ** FRONT INDIVIDUAL CASTER IN DEGREES.. +1.40° + or - 1.00° +1.40° + or - 1.00° +1.40° + or - 1.00° Front Side To Side Caster Difference Not To Exceed +or- 0.40° Front Side To Side Camber Difference Not To Exceed. 1.00° MAX 0.00° - 1.00° MAX 0.00° - 1.00° MAX *** FRONT INDIVIDUAL TOE RIGHT/ LEFT..... ... +0.05°+or- 0.10° +0.05° +or- 0.10° +0.05° +or- 0.10° FRONT TOTAL TOE..... . Specified In Degrees +0.10° +or- 0.20° +0.10° +or- 0.20° +0.10° +or- 0.20° FRONT SIDE TO SIDE TOE DIFFERENTIAL . 0.00° +or- 0.40° 0.00° +or- 0.40° 0.00° +or- 0.40° **** REA TOTAL TOE. .. 0.0 mm 12.5 mm MAX 0.0 mm 12.5 mm MAX 0.0 mm 12.5 mm MAX *****REAR RIDE HEIGH" FRONT RIDE HEIGHT (MEASURED AT TOP OF FENDER WHEEL OPENING).. 766.0 mm +or-10.0mm 772.0 mm +or-10.0mm 802.5 mm +or-10.0mm *****REAR RIDE HEIGHT SIDE TO SIDE DIFFERENTIAL 0.0 mm 12.5 mm MAX 0.0 mm 12.5 mm MAX 0.0 mm 12.5 mm MAX 2 - 8 SUSPENSION NS SPECIFICATIONS pension is used on these vehicles. Vertical shock absorbing Mc Pherson Struts attach to the top of the steering knuckle and to the front strut tower. This interconnection between the steering knuckle position pro-vides for the correct front Caster and Camber set- tings for the vehicle, at the time the vehicle is designed. Lower control arms are attached inboard to the steering knuckle. Attachment of the lower control arm to the steering knuckle is done through a ball joint in the lower control arm. During steering maneuvers, the strut and the steering knuckle (through the ball joint and a pivot bearing in the strut's upper retainer) turn as an assembly. SUSPENSION CRADLE (CROSSMEMBER) This vehicle uses a one piece cast aluminum cradle for the front suspension. The cradle is used as the attaching points for the lower control arms, stabilizer bar and steering gear. The cradle also has the power steering hoses and the chassis brake tubes attached to it. The cradle is mounted to the front frame rails at four points, two on each side of the vehicle. The cradle is mounted to the front frame rails at four points, two on each side of the vehicle using four isolators, one located at each mounting bolt location. WARNING: If a threaded hole in the suspension cradle needs to be repaired, only use the type of thread insert and installation procedure specified for this application. The threaded holes in the cradle that are used for attachment of the lower control arm rear bushing retainer, power steering hose and chassis brake tubes can be repaired. The repair is done by the installation of a Heli-Coil thread insert which has been specifically devel- oped for this application. Refer to the Mopar Parts Catalog for the specified Heli-Coil thread insert is detailed in the Service Procedures sec- tion in this group of the service manual. NS SUSPENSION 2 - 9 39. Mc PHERSON STRUT ASSEMBLY The front suspension of the vehicle is supported by coil springs positioned around the strut assembly and a lower spring seat on the strut fluid reservoir. The top of each strut assembly is bolted to the upper fender reinforcement (strut tower) through a rubber isolated mount. The bottom of the strut assembly attaches to the steering knuckle with two through bolts. Caster is a fixed setting on all vehicles and is not adjustable when an alignment is performed. In the event the camber setting on a vehicle requires adjustment, a service strut is available which will provide a method by which the camber can be adjusted. The strut assemblies on this vehicle are inter-con- nected by the front stabilizer bar. STEERING KNUCKLE The steering knuckle (Fig. 1) is a single casting with legs machined for attachment of the strut damper, steering linkage, disc brake caliper, and lower control arm ball joint. The steering knuckle also has the front hub/bearing assembly mounted to it. The hub is positioned through the bearing and knuckle, with the constant velocity stub shaft splined to and isolated from the body of the vehicle using 2 types of rubber bushings. The front lower control arm bushing is the spool type and is pressed into the lower control arm. The front and rear of the lower control arm is mounted to the cast crossmember using a pivot bolt through the center of the front pivot bushing, and a retainer which traps the rear bushing in the crossmember. The ball joint is pressed into the steering knuckle leg with a clamp bolt. The ball joint is lubricated for the life of the vehi cle and does not require any periodic lubrication. STABILIZER BAR The stabilizer bar interconnects both Mc Pherson strut assemblies of the vehicle and is attached through rubber isolator bushings to the front suspen- sion cradle Jounce and rebound movements affecting one wheel are partially transmitted to the opposite wheel to stabilize body roll Attachment of the stabilizer bar to the front sus- pension cradle is through 2 rubber-isolator bushings and bushing retainers. The stabilizer bar to Mc Pher- son strut assembly attachment is done utilizing a sway bar attaching link. All parts of the stabilizer bar to the front susand installation. The split in the stabilizer bar to cross- member bushing should be positioned toward the rear of the vehicle. STABILIZER BAR ATTACHING LINK The stabilizer bar attaching links are used to attach each end of the stabilizer bar to the front strut assemblies. This reduces the fore-and-aft rate of the stabilizer bar from the rest of the vehicle's front suspension. HUB AND BEARING ASSEMBLY The Unit III Front Hub and Bearing Assembly is used on all front wheel size on the vehicle. Vehicles equipped with 14 inch wheels have a 4 inch wheel mounting stud pattern. If a hub and bearing assembly needs to be replaced, be sure that the replacement assembly has the same size wheel mounting stud pattern as the original part. This unit is serviced only as a complete assembly. It is mounted to the steering knuckle 2 - 10 SUSPENSION NS DESCRIPTION AND OPERATION (Continued) 40. COIL SPRING Coil springs are rated separately for each corner or side of the vehicle depending on optional equipment and type of vehicle service. During service procedures when both springs are removed, mark springs to ensure installation in original position. Each coil spring require replacement, be sure that the springs needing replacement, are replaced with springs meeting the correct load rating for the vehicle and its specific options. BALL JOINT The ball joint (Fig. 2) to provide clearance for the steering knuckle clamp bolt and to provide retention of the ball stud in the steering knuckle. The ball joint stud is clamped and locked into the steering knuckle leg using a pinch bolt. The ball joint used on this vehicle is replaceable and if found defective can be serviced as a separate component of the lower control arm assembly. WHEEL MOUNTING STUDS If wheel attaching studs need to be replaced in the hub and bearing assembly the studs CAN NOT be hammered out of the hub flange. If a stud is removed by hammering it out of the bearing failure. Use the procedure and special tools shown in the service procedures section for the wheel mounting studs when replacing the wheel attaching studs. The hub and bearing assembly does not require removal from the steering knuckle or the rear knuckle or the rear knuckle in the hub and bearing assembly. DIAGNOSIS AND TESTING Mc PHERSON STRUT (1) Inspect for damaged or broken coil springs (Fig. 3). (2) Inspect for torn or damaged strut assembly dust boots (Fig. 3). (3) Inspect the coil spring isolator on the lower spring seat, (Fig. 3) for any signs of damage or dete- rioration. (4) Lift dust boots (Fig. 3) for any signs of damage or dete- rioration. the side and dripping off lower end of unit). A slight amount of seepage between the strut rod and strut shaft seal is not unusual and does not affect performance of the strut assembly (Fig. 4). Also inspect jounce bumpers for signs of damage or deterioration. Fig. 2 Ball Joint Assembly Fig. 3 Mc Pherson Strut Assembly Inspection Fig. 4 Strut Assembly (Fig. 4). Leakage Inspection NS SUSPENSION 2 - 11 DESCRIPTION AND OPERATION (Continued) 41. STEERING KNUCKLE The front suspension IT MUST BE REPLACED. If bent, broken or damaged in any way, do not attempt to straighten or repair the steer- ing knuckle. Service replacement of the front hub/bearing assembly can be done with the front steering knuckle remaining on the vehicle. LOWER CONTROL ARM If damaged, the lower control arm for signs of damage from contact with the ground or road debris. If lower control arm shows any sign of damage, inspect lower control arm for distortion. Do not attempt to repair or straighten a broken or bent lower control arm. The serviceable components of the lower control arm bushings for severe deterioration, and replace if required. Inspect ball joint per inspection procedure in this section of the service manual and replace if required. Service procedures to replace these components are detailed in the specific compo- nent removal and installation sections in this group of the service manual. wheels, grasp the grease fitting as shown in (Fig. 5) and with no mechanical assistance or added force attempt to rotate the grease fitting. If the ball joint is recommended. STABILIZER BAR Inspect for broken or distorted sway bar bushings, bushing retainers, and worn or damaged sway bar to strut attaching links. If sway bar to front suspension cradle bushing off sway bar. HUB AND BEARING ASSEMBLY The condition of the front hub and bearing assem- bly is diagnosed using the inspection and testing pro- cedure detailed below. The bearing contained in the Unit III front hub/ bearing assembly will produce noise and vibration when worn or damaged. The noise will generally change when the bearings are loaded. A road test of the vehicle is normally required to determine the location of a worn or damaged bearing. Find a smooth level road surface and bring the vehicle up to a constant speed. When vehicle is at a constant speed, swerve the vehicle back and forth from the left and to the right. This will load and unload the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.. SERVICE PROCEDURES SUSPENSION CRADLE THREAD REPAIR PROCEDURE WARNING: When performing this procedure use only the thread inserts which are specified in the Mopar Parts Catalog for this repair procedure. These thread inserts have been specifically devel- oped for this application and use of other types of thread inserts can result in an inferior long term repair. The threaded holes in the front suspension cradle, if damaged, can repaired by installing a Heli-Coil thread insert. The threaded holes that are repairable using the thread insert, are the lower control arm rear bushing retainer mounting bolt holes, routing bracket attach- ing locations for the power steering hoses, and brake hose attachment holes. This repair procedure now allows the threaded holes in the suspension crossmember to be repaired, eliminating the need to replace the crossmember if damage occurs to one of the threaded holes. The specific tools and equipment required to install the thread insert are listed below. Refer to the Fig. 5 Checking Ball Joint Wear 2 - 12 SUSPENSION NS DIAGNOSIS AND TESTING (Continued) 42. instructions included with the thread insert for the detailed procedure used for the installation of the thread insert. are for the repair of M8x1.25 and M10x1.5 threads. Be sure the correct tools are used for the required thread insert size. TOOL REQUIREMENT FOR M8x1.25 Thread • 8.3mm (5/16 in.) Drill Bit • 120° Countersink • Heli-Coil Gage #4624-8 • Heli-Coil Hand Inserting Tool 7751-8 • Needle Nose Pliers - For Removal Of Thread Insert Driving Tang TOOL REQUIREMENT FOR M10x1.5 Thread • 10.5mm (25/64 in.) Drill Bit • 120° Countersink • Heli-Coil Tap #4863-10 • Heli-C REMOVAL WARNING: DO NOT REMOVE THE NUT FROM THE STRUT ASSEMBLY IS INSTALLED IN VEHICLE, OR BEFORE STRUT ASSEMB ual, for the required lifting procedure to be used for this vehicle. (2) Remove the wheel and tire assembly from loca- tion on front of vehicle requiring strut removal. (3) If both strut assemblies are to be removed, mark the strut assemblies are to be removed, mark the strut assemblies right or left according to which side of the vehicle they were removed from. (4) Remove the hydraulic brake hose routing bracket and the speed sensor cable routing bracket from the strut damper brackets (Fig. 6). NOTE: When removing nut from stud of stabilizer bar attaching link, do not allow stud to rotate. Hold stud from rotating by inserting a Torx Plus 40IP bit in the end of the stud as shown in (Fig. 7). (5) Remove the stabilizer bar attaching link (Fig. 7) from the bracket on the strut assembly. CAUTION: The steering knuckle to strut assembly attaching bolts are serrated and must not be turned during removal. Remove the 3 nuts attaching bolts (Fig. 8). (7) Remove the 3 nuts attaching bolts are serrated and must not be turned during removal. the strut assembly into strut tower. Install the 3 upper strut mount attaching nut/washer assemblies (Fig. 9). Then using a crow foot. tighten the 3 attaching nuts to a torque of 28 N·m (250 in. lbs.). Fig. 6 Brake Hose And Speed Sensor Cable Routing Fig. 7 Stabilizer Bar Link To Strut Attachment NS SUSPENSION 2 - 13 SERVICE PROCEDURES (Continued) 43. CAUTION: The steering knuckle to strut assembly attaching bolts are seried and must not be turned during installation. Install nuts while holding bolts stationary in the steering knuckles. (2) Align strut assembly clevis bracket mounting holes. Install the 2 strut assembly clevis bracket. Align the strut assembly clevis bracket mounting holes. Install the 2 strut assembly clevis bracket. knuckle using a cam bolt, the cam bolt must be installed in the lower slotted hole on strut clevis bracket. Also, attaching bolts should be installed with the nuts facing the front of the vehicle (Fig. 8). Tighten the strut assembly to steering knuckle attaching bolts to a torque of 88 N·m (65 ft. lbs.) plus an additional 1/4 turn after specified torque is met. (3) Install stabilizer bar attaching link (Fig. 7) on bracket of strut assembly. Install stabilizer bar attaching link, do not allow stud to rotate. Hold stud from rotating by inserting a Torx Plus 40IP bit in the end of the stud as shown in (Fig. 10). (4) Tighten the stabilizer bar link to strut attach- ing nut using a Torx Plus 40IP bit and crowfoot as shown in (Fig. 10) to a torque of 88 N·m (65 ft. lbs.). (5) Install hydraulic brakets on the strut assembly brackets (Fig. 6). Tighten the routing brackets on the strut assembly brackets (Fig. 6). assembly on the vehicle. (7) Install and tighten the wheel mounting stud nuts in proper sequence until all nuts are torqued to half specification. Then repeat the tightening sequence to the full specification. Then repeat the tightening sequence to the full specification. Hoisting in the Lubri- cation And Maintenance Section of this manual for the required lifting procedure to be used for this vehicle. (2) Remove the wheel and tire assembly from the vehicle. (4) Remove the wave washer (Fig. 12) from the end of the stub axle. (3) Remove the wheel and tire assembly from the vehicle. (4) Remove the wave washer (Fig. 12) from the end of the stub axle. (3) Remove the wheel and tire assembly from the vehicle. (4) Remove the wave washer (Fig. 12) from the end of the stub axle. (3) Remove the wave washer (Fig. 12) from the end of the stub axle. 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(5) With the vehicle's brakes applied to keep hub from turning, loosen and remove the stub axle to hub nut. (6) Remove the disc brake caliper from the steer- ing knuckle. Caliper is removed by first rotating top of caliper away from steering knuckle and then removing bottom of caliper out from under machined abutment on steering knuckle (Fig. 14). (8) Support disc brake caliper assembly by using a wire hook and suspending it from the strut assembly (Fig. 15). Do not allow the brake caliper assembly to hang by the brake flex hose. Fig. 11 Hub/Bearing To Stub Axle Retaining Nut Fig. 12 Wave Washer Fig. 13 Front Disc Brake Caliper NS SUSPENSION 2 - 15 REMOVAL AND INSTALLATION (Continued) 45. (9) Remove the brake rotor from the hub and bear- ing assembly (Fig. 16). (10) Remove nut attaching outer tie rod end to steering knuckle (Fig. 17). Nut is to be removed from tie rod end using the following procedure, hold tie rod end from steering knuckle using Remover, Special Tool MB-991113 (Fig. 18). (12) Remove the front wheel speed sensor (Fig. 19) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. When installing the steering knuckle. When installing the steering knuckle. The pinch bolt must be installed from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. (13) If equipped, remove the wheel stop (Fig. 20) from the steering knuckle. 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(13) If equipped (Fig. 20) from the steering knuckle. (13) If equipped (Fig. 20) from the steering knuckle. (13) If equipped (Fig. 20) from the steering knuckle. (13) If equipped (Fig. 20) from the steering knuckle. (13) If equipped (Fig. 20) from the st Removing Tie Rod End Attaching Nut Fig. 18 Tie Rod End Removal From Steering Knuckle Arm Fig. 19 Front Wheel Speed Sensor Fig. 20 Wheel Stop Location On Steering Knuckle to ball joint stud, clamping nut and bolt (Fig. 21) from the steer- ing knuckle. (15) Using a pry bar, separate steering knuckle from ball joint stud (Fig. 22). Note: Use caution when separating ball joint stud from steering knuckle, so ball joint stud from steering knuckle from ball joint stud from steering knuckle. removing outer C/V Joint from the hub/bearing assembly in steering knuckle, end of driveshaft must be sup- ported. (16) Pull steering knuckle assembly out and away from the outer C/V joint of the driveshaft must be sup- ported. (16) Pull steering knuckle assembly out and away from the outer C/V joint of the driveshaft must be sup- ported. (16) Pull steering knuckle assembly attaching bolts are seried and must not be turned during removal Remove nuts while holding bolts stationary in the steering knuckles. (17) Remove the 2 steering knuckle to strut damper clevis bracket attaching bolts (Fig. 24). (18) Remove the steering knuckle from the strut. INSTALL (1) Transfer, or install if necessary, a new hub/ bearing assembly into the steering knuckle. Refer to Hub And Bearing Assembly Service in this section of the service manual for the required removal and installation procedure for the front hub/bearing assembly. CAUTION: The steering knuckle to strut assembly attaching bolts are service manual for the required removal and must not be turned during installation. Install nuts while holding bolts stationary in the steering knuckles. Fig. 21 Control Arm To Steering Knuckle Attachment Fig. 22 Separating Ball Joint Stud From Steering Knuckle Fig. 23 Steering Knuckle Separation From Driveshaft Fig. 24 Strut To Steering Knuckle Attaching Bolts NS SUSPENSION 2 - 17 REMOVAL AND INSTALLATION (Continued)

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