

LUBRICATION & MAINTENANCE

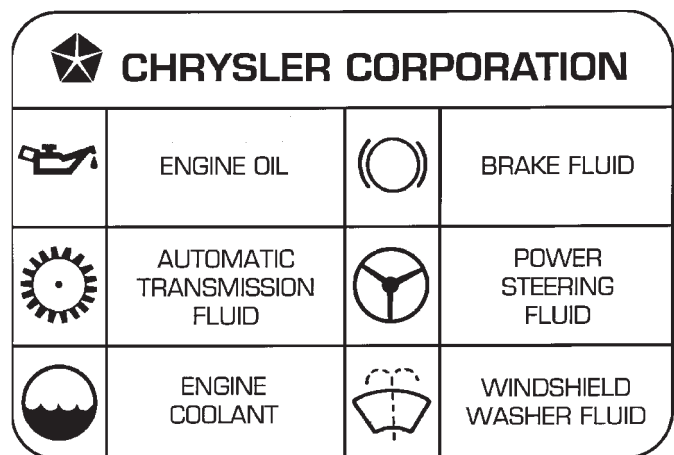
TABLE OF CONTENTS

	page	page
INTERNATIONAL SYMBOLS		
DESCRIPTION — INTERNATIONAL SYMBOLS .. 1		
FLUID TYPES		
DESCRIPTION		
DESCRIPTION - FLUID TYPES	1	
DESCRIPTION - AXLE	2	
DESCRIPTION - MANUAL TRANSMISSION ...	2	
DESCRIPTION - AUTOMATIC		
TRANSMISSION FLUID	2	
DESCRIPTION - TRANSFER CASE - NV231 ..	3	
DESCRIPTION - TRANSFER CASE - NV242 ..	3	
DESCRIPTION - ENGINE COOLANT	3	
OPERATION - AUTOMATIC TRANSMISSION		
FLUID	4	
FLUID CAPACITIES		
SPECIFICATIONS - FLUID CAPACITIES	4	
FLUID FILL/CHECK LOCATIONS		
DESCRIPTION	5	
MAINTENANCE SCHEDULES		
DESCRIPTION	5	
HOISTING		
STANDARD PROCEDURE - HOISTING		
RECOMMENDATIONS	5	
JUMP STARTING		
STANDARD PROCEDURE - JUMP STARTING		
PROCEDURE	6	
TOWING		
STANDARD PROCEDURE - TOWING	6	

INTERNATIONAL SYMBOLS

DESCRIPTION — INTERNATIONAL SYMBOLS

DaimlerChrysler Corporation uses international symbols to identify engine compartment lubricant and fluid inspection and fill locations (Fig. 1).



9500-1

Fig. 1 International Symbols

FLUID TYPES

DESCRIPTION

DESCRIPTION - FLUID TYPES

When service is required, DaimlerChrysler Corporation recommends that only Mopar® brand parts, lubricants and chemicals be used. Mopar® provides the best engineered products for servicing DaimlerChrysler Corporation vehicles.

Only lubricants bearing designations defined 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)

SAE VISCOSITY RATING

An SAE viscosity grade is used to specify the viscosity of engine oil. These are specified with a dual SAE viscosity grade which indicates the cold-to-hot temperature viscosity range. Example SAE 5W-30 = multigrade engine oil.

DaimlerChrysler Corporation only recommends multigrade engine oils.

FLUID TYPES (Continued)

API QUALITY CLASSIFICATION

This symbol (Fig. 2) on the front of an oil container means that the oil has been certified by the American Petroleum Institute (API) to meet all the lubrication requirements specified by DaimlerChrysler Corporation.



9400-9

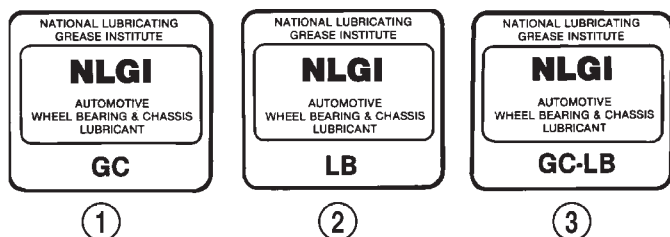
Fig. 2 API Symbol

GEAR LUBRICANTS

SAE ratings also apply to multigrade gear lubricants. In addition, API classification defines the lubricants usage. Such as API GL-5 and SAE 75W-90.

LUBRICANTS AND GREASES

Lubricating grease is rated for quality and usage by the NLGI. All approved products have the NLGI symbol (Fig. 3) on the label. At the bottom NLGI symbol is the usage and quality identification letters. Wheel bearing lubricant is identified by the letter "G". Chassis lubricant is identified by the latter "L". The letter following the usage letter indicates the quality of the lubricant. The following symbols indicate the highest quality.



9200-7

Fig. 3 NLGI Symbol

- 1 - WHEEL BEARINGS
- 2 - CHASSIS LUBRICATION
- 3 - CHASSIS AND WHEEL BEARINGS

SPECIALIZED LUBRICANTS AND OILS

Some maintenance or repair procedures may require the use of specialized lubricants or oils. Consult the appropriate sections in this manual for the correct application of these lubricants.

DESCRIPTION - AXLE

A multi-purpose, hypoid gear lubricant which conforms to MIL-L-2105C and API GL 5 quality specifications should be used. Mopar Hypoid Gear Lubricants conforms to these specifications.

FRONT AXLE

- Lubricant for 186FIA (Model 30) axle is SAE 75W-140 SYNTHETIC.

REAR AXLE

- Lubricant for 198RBI (Model 35) axle is SAE 75W-140 SYNTHETIC.
- Lubricant for 8 1/4 axle is a thermally stable SAE 75W-90. For trailer tow or heavy duty applications the lubricant should be replaced with SAE 75W-140 SYNTHETIC.

NOTE: Trac-lok® equipped axles require a friction modifier be added to the lubricant.

CAUTION: If axle is submerged in water, lubricant must be replaced immediately to avoid possible premature axle failure.

DESCRIPTION - MANUAL TRANSMISSION

Mopar® manual transmission fluid is the lubricant recommended for the NV1500 and the NV3550 transmissions.

DESCRIPTION - AUTOMATIC TRANSMISSION FLUID

NOTE: Refer to the maintenance schedules in this group for the recommended maintenance (fluid/filter change) intervals for this transmission.

NOTE: Refer to Service Procedures in this group for fluid level checking procedures.

Mopar® ATF +4, type 9602, Automatic Transmission Fluid is the recommended fluid for DaimlerChrysler automatic transmissions.

Dexron II fluid IS NOT recommended. Clutch chatter can result from the use of improper fluid.

Mopar® ATF +4, type 9602, Automatic Transmission Fluid when new is red in color. The ATF is dyed red so it can be identified from other fluids used in the vehicle such as engine oil or antifreeze. The red color is not permanent and is not an indicator of fluid condition. As the vehicle is driven, the ATF will begin to look darker in color and may eventually become brown. **This is normal.** ATF+4 also has a unique

FLUID TYPES (Continued)

odor that may change with age. Consequently, odor and color cannot be used to indicate the fluid condition or the need for a fluid change.

FLUID ADDITIVES

DaimlerChrysler strongly recommends against the addition of any fluids to the transmission, other than those automatic transmission fluids listed above. Exceptions to this policy are the use of special dyes to aid in detecting fluid leaks.

Various "special" additives and supplements exist that claim to improve shift feel and/or quality. These additives and others also claim to improve converter clutch operation and inhibit overheating, oxidation, varnish, and sludge. These claims have not been supported to the satisfaction of DaimlerChrysler and these additives **must not be used**. The use of transmission "sealers" should also be avoided, since they may adversely affect the integrity of transmission seals.

DESCRIPTION - TRANSFER CASE - NV231

Recommended lubricant for the NV231 transfer case is Mopar® ATF +4, type 9602, Automatic Transmission Fluid.

DESCRIPTION - TRANSFER CASE - NV242

Recommended lubricant for the NV242 transfer case is Mopar® ATF+4, type 9602 Automatic Transmission Fluid.

DESCRIPTION - ENGINE COOLANT

WARNING: ANTIFREEZE IS AN ETHYLENE GLYCOL BASE COOLANT AND IS HARMFUL IF SWALLOWED OR INHALED. IF SWALLOWED, DRINK TWO GLASSES OF WATER AND INDUCE VOMITING. IF INHALED, MOVE TO FRESH AIR AREA. SEEK MEDICAL ATTENTION IMMEDIATELY. DO NOT STORE IN OPEN OR UNMARKED CONTAINERS. WASH SKIN AND CLOTHING THOROUGHLY AFTER COMING IN CONTACT WITH ETHYLENE GLYCOL. KEEP OUT OF REACH OF CHILDREN. DISPOSE OF GLYCOL BASE COOLANT PROPERLY, CONTACT YOUR DEALER OR GOVERNMENT AGENCY FOR LOCATION OF COLLECTION CENTER IN YOUR AREA. DO NOT OPEN A COOLING SYSTEM WHEN THE ENGINE IS AT OPERATING TEMPERATURE OR HOT UNDER PRESSURE, PERSONAL INJURY CAN RESULT. AVOID RADIATOR COOLING FAN WHEN ENGINE COMPARTMENT RELATED SERVICE IS PERFORMED, PERSONAL INJURY CAN RESULT.

CAUTION: Use of Propylene Glycol based coolants is not recommended, as they provide less freeze protection and less corrosion protection.

The cooling system is designed around the coolant. The coolant must accept heat from engine metal, in the cylinder head area near the exhaust valves and engine block. Then coolant carries the heat to the radiator where the tube/fin radiator can transfer the heat to the air.

The use of aluminum cylinder blocks, cylinder heads, and water pumps requires special corrosion protection. Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (MS-9769), or the equivalent ethylene glycol base coolant with organic corrosion inhibitors (called HOAT, for Hybrid Organic Additive Technology) is recommended. This coolant offers the best engine cooling without corrosion when mixed with 50% Ethylene Glycol and 50% distilled water to obtain a freeze point of -37°C (-35°F). If it loses color or becomes contaminated, drain, flush, and replace with fresh properly mixed coolant solution.

CAUTION: Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (MS-9769) may not be mixed with any other type of antifreeze. Mixing of coolants other than specified (non-HOAT or other HOAT), may result in engine damage that may not be covered under the new vehicle warranty, and decreased corrosion protection.

COOLANT PERFORMANCE

The required ethylene-glycol (antifreeze) and water mixture depends upon climate and vehicle operating conditions. The coolant performance of various mixtures follows:

Pure Water-Water can absorb more heat than a mixture of water and ethylene-glycol. This is for purpose of heat transfer only. Water also freezes at a higher temperature and allows corrosion.

100 percent Ethylene-Glycol-The corrosion inhibiting additives in ethylene-glycol need the presence of water to dissolve. Without water, additives form deposits in system. These act as insulation causing temperature to rise to as high as 149°C (300°F). This temperature is hot enough to melt plastic and soften solder. The increased temperature can result in engine detonation. In addition, 100 percent ethylene-glycol freezes at -22°C (-8°F).

50/50 Ethylene-Glycol and Water-Is the recommended mixture, it provides protection against freezing to -37°C (-34°F). The antifreeze concentration **must always** be a minimum of 44 percent, year-round in all climates. If percentage is lower, engine parts may be eroded by cavitation. Maximum protection against freezing is provided with a 68 percent antifreeze concentration, which prevents freezing down to -67.7°C (-90°F). A higher percentage will freeze at a warmer temperature. Also, a higher per-

FLUID TYPES (Continued)

centage of antifreeze can cause the engine to over-heat because specific heat of antifreeze is lower than that of water.

CAUTION: Richer antifreeze mixtures cannot be measured with normal field equipment and can cause problems associated with 100 percent ethylene-glycol.

CAUTION: Do not use coolant additives that are claimed to improve engine cooling.

OPERATION - AUTOMATIC TRANSMISSION FLUID

The automatic transmission fluid is selected based upon several qualities. The fluid must provide a high level of protection for the internal components by providing a lubricating film between adjacent metal components. The fluid must also be thermally stable so that it can maintain a consistent viscosity through a large temperature range. If the viscosity stays constant through the temperature range of operation, transmission operation and shift feel will remain consistent. Transmission fluid must also be a good conductor of heat. The fluid must absorb heat from the internal transmission components and transfer that heat to the transmission case.

FLUID CAPACITIES

SPECIFICATIONS - FLUID CAPACITIES

DESCRIPTION	SPECIFICATION
FUEL TANK	18.5 U.S. Gallons (70 Liters)****
ENGINE OIL	
Engine Oil - with Filter - 2.4L	2.4L (5.0 qts.)
Engine Oil - with Filter - 3.7L	3.7L (5.0 qts.)
Engine Oil - With Filter - 2.5L Diesel	6.5L (6.9 qts.)
ENGINE COOLANT	
Cooling System - 2.4L	9.6L (10.1 qts.)
Cooling System - 3.7L	12.3L (13.0 qts.)
Cooling System - 2.5L Diesel	12.5L (13.2 qts.)
AUTOMATIC TRANSMISSION	
Service Fill - 45RFE	4.73L (10.0 pts)
O-haul Fill - 45RFE	13.33L (28.0 pts)
Dry fill capacity Depending on type and size of internal cooler, length and inside diameter of cooler lines, or use of an auxiliary cooler, these figures may vary. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC/FLUID - STANDARD PROCEDURE)	
TRANSFER CASE	
NV231	1.4L (2.95 pts.)
NV242	1.6L (3.4 pts.)
MANUAL TRANSMISSION	
NV1500 (Approximate dry fill or fill to bottom edge of the fill plug hole.)	2.28L (2.41 qts.)
NV3550 (Approximate dry fill or fill to bottom edge of fill plug hole.)	2.28L (2.41 qts.)
FRONT AXLE	
186 FIA (Model 30)	1.24L (41.9 fl. oz.)
REAR AXLE	
198 RBI (Model 35)	1.78L (60.2 fl. oz.)*
8 1/4	2.08L (4.4 pts.)*
* When equipped with Trac-lok, include 4.0 ounces of Friction Modifier.	
****Nominal refill capacities are shown. A variation may be observed from vehicle to vehicle due to manufacturing tolerance and refill procedure.	

FLUID FILL/CHECK LOCATIONS

DESCRIPTION

The fluid check/fill point locations are located in each applicable service manual section.

MAINTENANCE SCHEDULES

DESCRIPTION

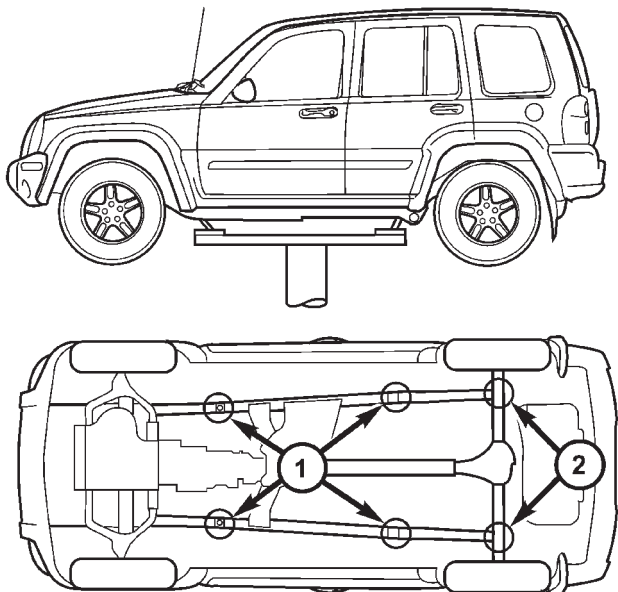
"Maintenance Schedule Information not included in this section, is located in the appropriate Owner's Manual."

HOISTING

STANDARD PROCEDURE - HOISTING RECOMMENDATIONS

Refer to the Owner's Manual for emergency vehicle lifting procedures.

When properly positioned, a floor jack can be used to lift a Jeep vehicle (Fig. 4). Support the vehicle in the raised position with jack stands at the front and rear ends of the frame rails.



80cb5b5a

Fig. 4 Correct Vehicle Lifting Locations

- 1 -
- Frame Contact Lift (Single Post)

Chassis Lift (Non-Axle Dual Post)

Outboard Lift (Dual Post)

Floor Jack
-
- 2 -
- Floor Jack

CAUTION: Do not attempt to lift a Jeep vehicle with a floor jack positioned under:

- A body side sill.
- A steering linkage component.
- A drive shaft.
- The engine or transmission oil pan.
- The fuel tank.
- A front suspension arm.
- Transfer case.

NOTE: Use the correct sub-frame rail or frame rail lifting locations only.

HOIST

Refer to the Owner's Manual for emergency vehicle lifting procedures.

A vehicle can be lifted with:

- A single-post, frame-contact hoist.
- A twin-post, chassis hoist.
- A ramp-type, drive-on hoist.

NOTE: When a frame-contact type hoist is used, verify that the lifting pads are positioned properly.

WARNING: THE HOISTING AND JACK LIFTING POINTS PROVIDED ARE FOR A COMPLETE VEHICLE. WHEN A CHASSIS OR DRIVETRAIN COMPONENT 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.

JUMP STARTING

STANDARD PROCEDURE - JUMP STARTING PROCEDURE

WARNING: REVIEW ALL SAFETY PRECAUTIONS AND WARNINGS IN GROUP 8A, BATTERY/STARTING/CHARGING SYSTEMS DIAGNOSTICS.

- DO NOT JUMP START A FROZEN BATTERY, PERSONAL INJURY CAN RESULT.
- DO NOT JUMP START WHEN BATTERY INDICATOR DOT IS YELLOW OR BRIGHT COLOR. BATTERY CAN EXPLODE.
- DO NOT ALLOW JUMPER CABLE CLAMPS TO TOUCH EACH OTHER WHEN CONNECTED TO A BOOSTER SOURCE.
- DO NOT USE OPEN FLAME NEAR BATTERY.
- REMOVE METALLIC JEWELRY WORN ON HANDS OR WRISTS TO AVOID INJURY BY ACCIDENTAL ARCHING OF BATTERY CURRENT.
- WHEN USING A HIGH OUTPUT BOOSTING DEVICE, DO NOT ALLOW DISABLED VEHICLE'S BATTERY TO EXCEED 16 VOLTS. PERSONAL INJURY OR DAMAGE TO ELECTRICAL SYSTEM CAN RESULT.

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:

- Generator drive belt condition and tension.
- Fuel fumes or leakage, correct if necessary.
- Frozen battery.
- Yellow or bright color test indicator, if equipped.
- Low battery fluid level.

CAUTION: If the cause of starting problem on disabled vehicle is severe, damage to booster vehicle charging system can result.

(2) When using another vehicle as a booster source, turn off all accessories, place gear selector in park or neutral, set park brake or equivalent and operate engine at 1200 rpm.

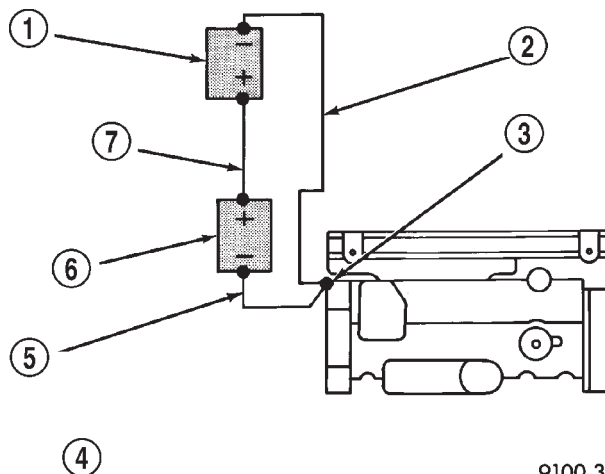
(3) On disabled vehicle, place gear selector in park or neutral and set park brake or equivalent. Turn OFF all accessories.

(4) Connect jumper cables to booster battery. RED clamp to positive terminal (+). BLACK clamp to negative terminal (-). DO NOT allow clamps at opposite end of cables to touch, electrical arc will result (Fig. 5). Review all warnings in this procedure.

(5) On disabled vehicle, connect RED jumper cable clamp to battery positive (+) terminal. Connect BLACK jumper cable clamp to the engine as close to the ground cable connection as possible (Fig. 5).

CAUTION: Do not crank starter motor on disabled vehicle for more than 15 seconds, starter will over-heat and could fail.

(6) 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 seconds, stop cranking engine and allow starter to cool (15 min.), before cranking again.



9100-3

Fig. 5 Jumper Cable Clamp Connections

- 1 - BOOSTER BATTERY
- 2 - NEGATIVE JUMPER CABLE
- 3 - ENGINE GROUND
- 4 - DO NOT ALLOW VEHICLES TO TOUCH
- 5 - BATTERY NEGATIVE CABLE
- 6 - DISCHARGED BATTERY
- 7 - POSITIVE JUMPER CABLE

DISCONNECT CABLE CLAMPS AS FOLLOWS:

- Disconnect BLACK cable clamp from engine ground on disabled vehicle.
- When using a Booster vehicle, disconnect BLACK cable clamp from battery negative terminal. Disconnect RED cable clamp from battery positive terminal.
- Disconnect RED cable clamp from battery positive terminal on disabled vehicle.

TOWING

STANDARD PROCEDURE - TOWING

A vehicle equipped with SAE approved wheel lift-type towing equipment can be used to tow Jeep vehicles. When towing a 4WD vehicle using a wheel-lift

TOWING (Continued)

towing device, use tow dollies under the opposite end of the vehicle. A vehicle with flatbed device can also be used to transport a disabled vehicle (Fig. 6).

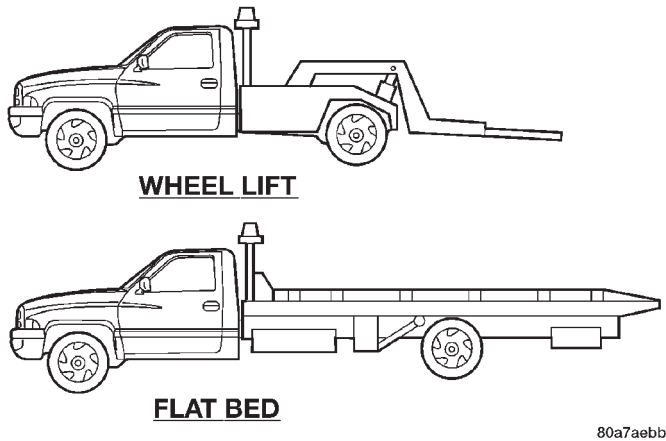


Fig. 6 Tow Vehicles With Approved Equipment

SAFETY PRECAUTIONS

CAUTION: The following safety precautions must be observed when towing a vehicle:

- Secure loose and protruding parts.
- Always use a safety chain system that is independent of the lifting and towing equipment.
- Do not allow towing equipment to contact the disabled vehicle's fuel tank.
- Do not allow anyone under the disabled vehicle while it is lifted by the towing device.
- Do not allow passengers to ride in a vehicle being towed.
- Always observe state and local laws regarding towing regulations.
- Do not tow a vehicle in a manner that could jeopardize the safety of the operator, pedestrians or other motorists.
- Do not attach tow chains, T-hooks, or J-hooks to a bumper, steering linkage, drive shafts or a non-reinforced frame hole.
- Do not tow a heavily loaded vehicle. Use a flat-bed device to transport a loaded vehicle.

TWO-WHEEL-DRIVE VEHICLE TOWING

DaimlerChrysler Corporation recommends that a vehicle be towed with the rear end lifted, whenever possible.

WARNING: WHEN TOWING A DISABLED VEHICLE AND THE DRIVE WHEELS ARE SECURED IN A WHEEL LIFT OR TOW DOLLIES, ENSURE THE TRANSMISSION IS IN THE PARK POSITION (AUTOMATIC TRANSMISSION) OR A FORWARD DRIVE GEAR (MANUAL TRANSMISSION).

WARNING: ENSURE VEHICLE IS ON A LEVEL SURFACE OR THE WHEELS ARE BLOCKED TO PREVENT VEHICLE FROM ROLLING.

TWO WHEEL DRIVE TOWING-REAR END LIFTED

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

2WD vehicles can be towed with the front wheels on the surface for extended distances at speeds not exceeding 48 km/h (30 mph).

- (1) Attach wheel lift device to rear wheels.
- (2) Place the transmission in neutral.
- (3) Raise vehicle to towing position.
- (4) Attach safety chains. Route chains so not to interfere with tail pipe when vehicle is lifted.
- (5) Turn the ignition switch to the OFF position to unlock the steering wheel.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

- (6) Secure steering wheel in straight ahead position with a clamp device designed for towing.
- (7) Place transmission in park.

TWO WHEEL DRIVE TOWING-FRONT END LIFTED

CAUTION: Many vehicles are equipped with air dams, spoilers, and/or ground effect panels. To avoid component damage, a wheel-lift towing vehicle or a flat-bed hauling vehicle is recommended.

- (1) Attach wheel lift device to rear wheels.
- (2) Place the transmission in neutral.
- (3) Raise the rear of the vehicle off the ground and install tow dollies under rear wheels.
- (4) Attach wheel lift device to front wheels and raise vehicle to towing position.
- (5) Attach the safety chains.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

- (6) Turn the ignition switch to the OFF position to unlock the steering wheel.
- (7) Secure steering wheel in straight ahead position with a clamp device designed for towing.
- (8) Place transmission in park.

FOUR-WHEEL-DRIVE VEHICLE TOWING

DaimlerChrysler Corporation recommends that a 4WD vehicle be transported on a flat-bed device. A Wheel-lift device can be used provided **the trailing wheels are off the ground and positioned in tow dollies.**

TOWING (Continued)

WARNING: WHEN TOWING A DISABLED VEHICLE AND THE DRIVE WHEELS ARE SECURED IN A WHEEL LIFT OR TOW DOLLIES, ENSURE THE TRANSMISSION IS IN THE PARK POSITION.

CAUTION: Many vehicles are equipped with air dams, spoilers, and/or ground effect panels. To avoid component damage, a wheel-lift towing vehicle or a flat-bed hauling vehicle is recommended.

FOUR WHEEL DRIVE TOWING—REAR END LIFTED

WARNING: ENSURE VEHICLE IS ON A LEVEL SURFACE OR THE WHEELS ARE BLOCKED TO PREVENT VEHICLE FROM ROLLING.

- (1) Attach wheel lift device to front wheels.
- (2) Place the transmission in neutral.
- (3) Raise the front of the vehicle off the ground and install tow dollies under front wheels.
- (4) Attach wheel lift device to rear wheels and raise vehicle to towing position.
- (5) Attach safety chains. Route chains so not to interfere with tail pipe when vehicle is lifted.
- (6) Turn the ignition switch to the OFF position to unlock the steering wheel.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

- (7) Secure steering wheel in straight ahead position with a clamp device designed for towing.
- (8) Place transmission in park.

FOUR WHEEL DRIVE TOWING—FRONT END LIFTED

WARNING: ENSURE VEHICLE IS ON A LEVEL SURFACE OR THE WHEELS ARE BLOCKED TO PREVENT VEHICLE FROM ROLLING.

- (1) Attach wheel lift device to rear wheels.
- (2) Place the transmission in neutral.
- (3) Raise the rear of the vehicle off the ground and install tow dollies under rear wheels.
- (4) Attach wheel lift device to front wheels and raise vehicle to towing position.
- (5) Attach the safety chains.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

- (6) Turn the ignition switch to the OFF position to unlock the steering wheel.
- (7) Secure steering wheel in straight ahead position with a clamp device designed for towing.
- (8) Place transmission in park.