

## SECTION 0

## GENERAL INFORMATION

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## SECTION 0A

## GENERAL INFORMATION

**NOTICE:** When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

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## HANDLING ELECTROSTATIC DISCHARGE (ESD) SENSITIVE PARTS

When handling an electronic part that has an ESD sensitive sticker (figure 1), the service technician should follow these guidelines to reduce any possible electrostatic charge build-up on the service technician's body and the electronic part in the dealership:

1. Do not open the package until it is time to install the part.
2. Avoid touching the electrical terminals of the part.
3. Before removing the part from its package, ground the package to a known good ground on the vehicle.
4. Always touch a known good ground before handling the part. This should be repeated while handling the part and more frequently after sliding across the seat, sitting down from a standing position or walking a distance.

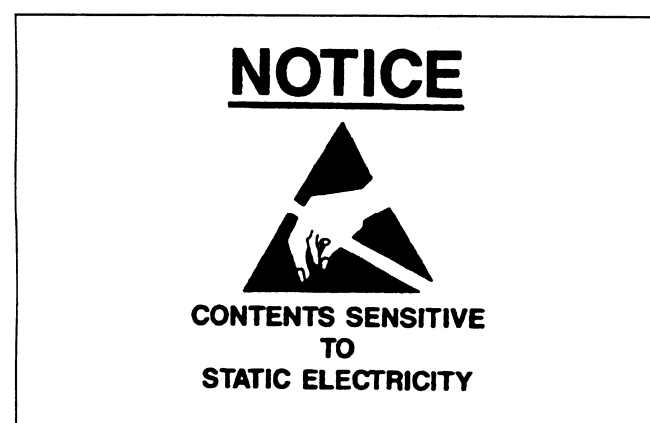


Figure 1. Electrostatic Discharge Symbol

## MODEL DESIGNATION

The model designation for this vehicle is NPR/W4S042. Refer to figure 2 for the model explanation and figure 2 for the model identification.

CODE	DESCRIPTION
W	Steel Tilt Cab
4	GVW Range - 10,001–16,000 lb
S	Cab Style-67.8 in BBC Steel Cab
0	Constant - For Future Expansion
42	Chassis Type-4 × 2

Figure 2. Model Explanation

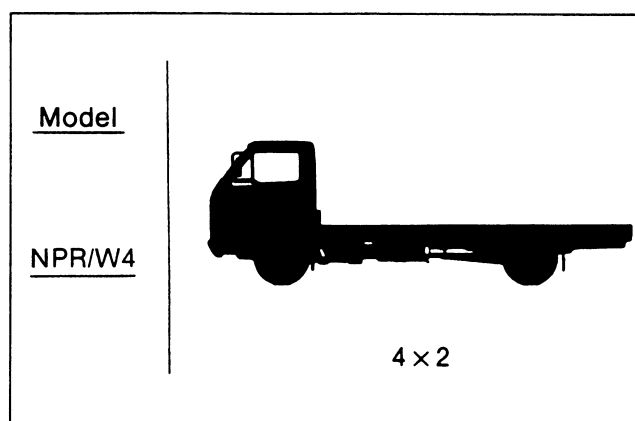


Figure 3. Model Identification

## VIN (VEHICLE IDENTIFICATION NUMBER) AND WEIGHT RATING PLATE

The VIN and Weight Rating Plate (figure 4) lists the manufacturer, gross vehicle weight for the vehicle, maximum front end weight at ground, maximum rear end weight at ground, and the VIN (vehicle identification number). This plate is located on the driver's door in the lower right hand corner.

The vehicle identification number is a legal identifier of your vehicle. It not only appears on the VIN plate, but also on the Vehicle Certificates of Title and Registration. The vehicle identification number specifically identifies a vehicle by code. Figure 5 displays the codes and descriptions for the model covered in this manual.

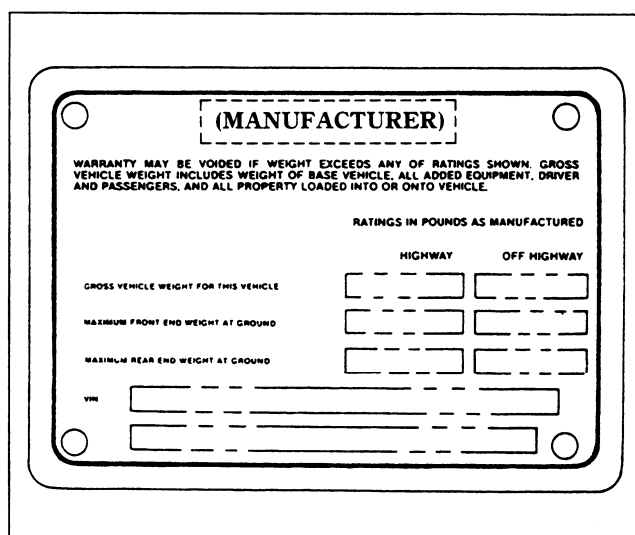


Figure 4. VIN Weight Rating Plate

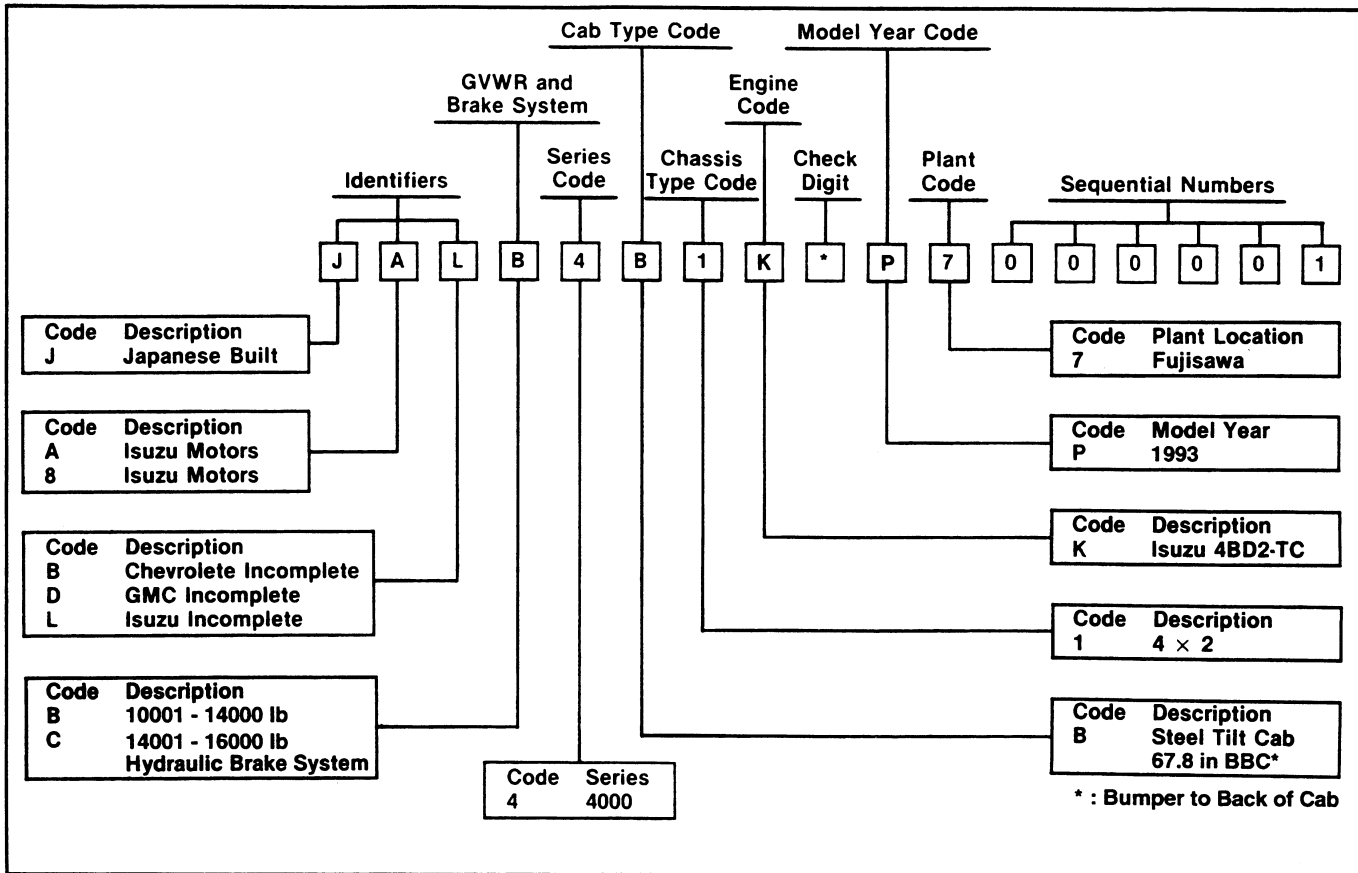


Figure 5. VIN Chart

**GVWR (GROSS VEHICLE WEIGHT RATING)**

The GVWR is the weight of a vehicle plus the weight of a vehicle's load. For the gross vehicle weight rating and the gross vehicle combined weight rating, refer to Model Explanation (figure 3). For the gross vehicle weight rating range refer to the VIN Chart (figure 5).

**SERVICE PARTS IDENTIFICATION LABEL**

The "Service Parts Identification" label (figure 6) lists major components and their part numbers plus vehicle options and their codes. The information on the label was printed at the factory; therefore, it represents only the equipment on the vehicle when it was shipped from the factory. **Always** refer to this label when ordering replacement service parts. (Refer to the "NOTICE" on the label.)

The service parts identification label is located on the left hand step support panel.

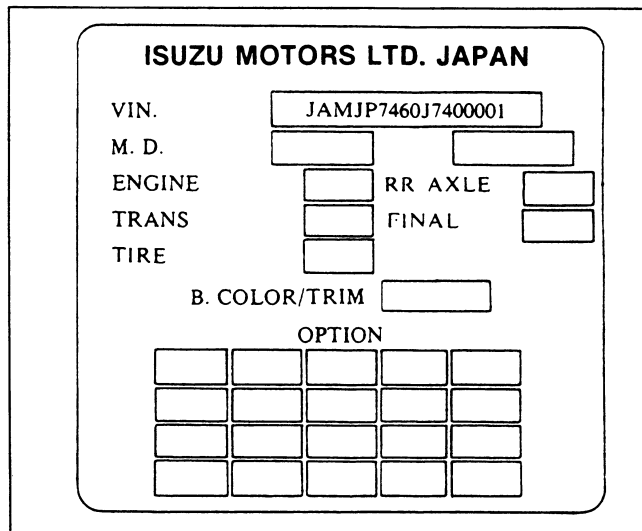


Figure 6. Service Parts Identification Label

# 0A-4 GENERAL INFORMATION

## REGULAR PRODUCTION OPTIONS (RPO) CODE LIST

The RPO list (figure 7) contains RPOs available on this model. Also, refer to the "Service Parts Identification" label (figure 6) for a list of the RPOs used on each specific vehicle.

OPTION CODE	OPTION DESCRIPTION	OPTION CODE	OPTION DESCRIPTION
RWC	CANADIAN EQUIPMENT	9AR	TIRE F&R: 8R17.5-10
6PS	RYDER PACKAGE		DISC F&R: 17.5X5.25-127 w/DOT MARK
6SH	BUDGET PACKAGE		WHITE DISC, FOR BUDGET
6JJ	DEALER INSTALLATION OPTION	9BR	TIRE F&R: 215/85R16-E
6FM	US TERRITORY		DISC F&R: 16X6K-127 w/DOT MARK
6FZ	FENDER COVER		WHITE DISC
EK7	MARK-VEHICLE NAME	9BS	TIRE F&R: 215/85R16-E
6JS	SEAT BELT EXTENSION		DISC F&R: 16X6K-127 w/DOT MARK
C60	AIR CONDITIONER-MANUAL CONTROL		WHITE DISC, FOR BUDGET
6TM	FRAME STRETCH KIT	9BV	TIRE F: 205/60R17.5, R:195/65R16
6HR	SUSPENSION SYSTEM-13,250 LBS.		DISC F: 5.25-17.5-127, R: 16X5.5K-108
6XC	SUSPENSION SYSTEM-14,250 LBS.		w/DOT MARK WHITE DISC
G73	AXLE REAR-HEAVY DUTY	9FC	TIRE F&R: 215/85R16-E
GT5	FINAL DRIVE GEAR RATIO-4.100 (41/10)		DISC F&R: 16X6K-127 w/DOT MARK
GV1	FINAL DRIVE GEAR RATIO-5.571 (39/7)		WHITE DISC (US BRAND)
HC6	FINAL DRIVE GEAR RATIO-4.556 (41/9)	9FD	TIRE F&R: 215/85R16-E
R41	FINAL DRIVE GEAR RATIO-5.857 (41/7)		DISC F&R: 16X6K-127 w/DOT MARK
S2J	FINAL DRIVE GEAR RATIO-4.777 (43/9)		WHITE DISC (ALL SEASON, US BRAND)
S7C	FINAL DRIVE GEAR RATIO-4.300 (43/10)	9GA	TIRE F&R: 215/85R16-E
J52	BRAKES-FRONT DISC, MULTIPLE PISTON		DISC F&R: 16X6K-127 w/DOT MARK
RLW	ENGINE-DIESEL 4 CYL. L 3.9L 4BD2	9GL	TIRE F&R: 215/85R16-E
EE2	GOVERNOR-ENGINE w/HIGH ALTITUDE COMPENSATOR		DISC F&R: 16X6K-127 w/DOT MARK
K51	TURBO CHARGER	9GM	TIRE F&R: 215/85R16-E
6HS	AIR CLEANER-WITH DUST SENSOR		DISC F&R: 16X6K-127 w/DOT MARK
8AA	LONG LIFE COOLANT (50%)		WHITE DISC, FOR BUDGET (ALL SEASON)
6HT	HEATER-OIL PAN	R46	SPARE TIRE & DISC WHEEL VAR.1
K05	HEATER-ENGINE BLOCK	P10	CARRIER-SPARE WHEEL (TRUCK)
RMK	AUTOMATIC TRANSMISSION 4-SPEED w/LOCK-UP	U01	LAMP-FIVE, ROOF MARKER
S7N	MANUAL TRANSMISSION-5 SPEED, MSA SPEED RATIO, DIRECT DRIVE	UE8	CLOCK-ELECTRIC DIGITAL
V66	POWER TAKE OFF-PROVISIONS FOR	UM2	RADIO-AM/FM STEREO PUSH BUTTON &TAPE PLAYER
6HU	FUEL SEDIMENTER-WITH HEATER	U69	RADIO-AM/FM (STEREO)
N33	STEERING COLUMN-TILT TYPE (w/TELESCOPIC)		
N40	POWER STEERING		Note: F=Front
84V	TIRE F&R: 7.5-16-10		R=Rear
	DISC F&R: 16X6GS-127 w/DOT MARK		w/=With
	WHITE DISC		
88V	TIRE F&R: 8R1 7.5-10		
	DISC F&R: 17.5X5.25-1 27 w/DOT MARK		
	WHITE DISC		

Figure 7. Regular Production Option List

**ENGINE SERIAL NUMBER**

The engine serial number is machined on the left side of the engine just above the oil pan.

**GRAPHIC SYMBOLS**

Graphic symbols are used on some controls and displays on the vehicle (figure 8). Many of these symbols are used internationally.

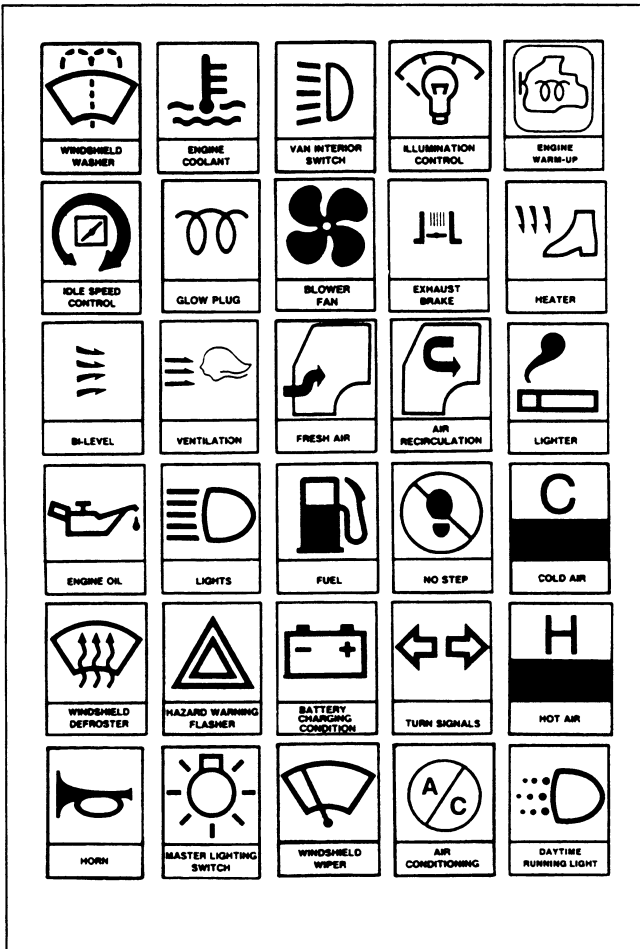


Figure 8. International Symbols

**ACTION SYMBOLS**

In this manual, much of the general narrative has been replaced with step-by-step procedures and the addition of "Action Symbols." To improve readability and to provide emphasis where necessary, the following symbols are used in the manual.

 ...Remove or Disconnect

 ...Install or Connect

 ...Disassemble

 ...Assemble

 ...Clean

 ...Inspect

 ...Measure

 ...Adjust

 ...Tighten to specified torque

 ...Important

**EMERGENCY STARTING A VEHICLE DUE TO DISCHARGED BATTERY**

If your vehicle will not start due to a discharged battery, it can often be started by using energy from another battery—a procedure called "jump starting."

This vehicle has a 12volt starting system and a negative ground electrical system. Be sure that the other vehicle also has a 12volt starting system, and that it is the negative (black "-") terminal which is grounded (attached to the engine block, chassis or frame rail). Its owner's manual may give you that information. **DO NOT TRY TO JUMP START IF YOU**

**ARE UNSURE OF THE OTHER VEHICLE'S VOLTAGE OR GROUND (OR IF THE OTHER VEHICLE'S VOLTAGE AND GROUND ARE DIFFERENT FROM YOUR VEHICLE).**

Some diesel engine vehicles have more than one battery because of higher torque required to start a diesel engine. This procedure can be used to start a single battery vehicle from any of the diesel vehicle's batteries. However, it may not be possible to start a diesel engine from a single battery in another vehicle, at low temperatures.

**NOTICE: Never tow the vehicle to start, because the surge forward when the engine starts could cause a collision with the tow vehicle. Also, this vehicle has 12volt batteries. Be sure the vehicle or equipment used to jump start your engine is also a 12volt Use of any other system may damage the vehicle's electrical components.**

## Jupm Stariting Instructions

**CAUTION:** Batteries produce explosive gases, contain corrosive acid, and supply levels of electrical current high enough to cause burns. Therefore, to reduce the risk of personal injury when working near a battery:

- Always shield your eyes and avoid leaning over a battery whenever possible.
- Do not expose a battery to open flames or sparks.
- Be sure any batteries, that have filler caps, are properly filled with fluid.
- Do not allow battery acid to contact eyes or skin. Flush any contacted area with water immediately and thoroughly, and get medical help.
- Follow each step in the jump starting instructions.

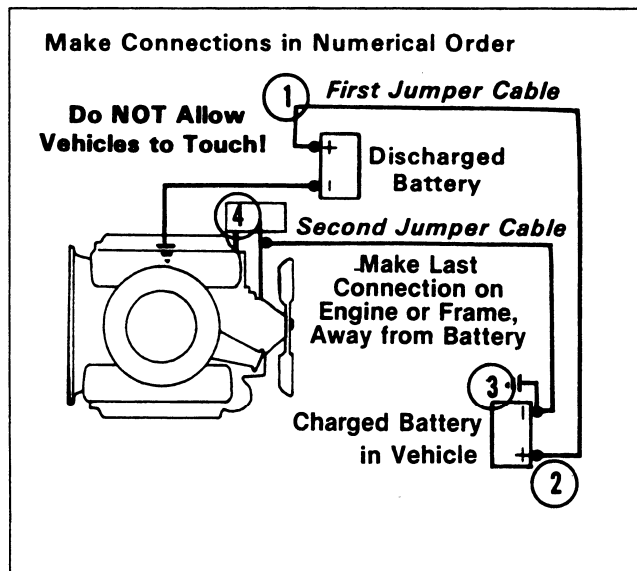


Figure 9. Jump Starting Diagram

1. Position the vehicle with the good (charged) battery so that the booster (jumper) cables will reach but never let the vehicles touch. Also, be sure the booster cables to be used do not have loose or missing insulation.
2. In both vehicles:
  - Turn off the engine control switch and all lights and accessories except the hazard flasher or any lights needed for the work area.
  - Apply the parking brake firmly, and shift the automatic transmission to Park or manual transmission to Neutral.
3. Make sure the cable clamps do not touch any other metal parts. Clamp one end of the first booster cable to the positive “+” terminal on one battery, and the other end to the positive terminal on the other battery. Never connect “+” to “-” (figure 9.)
4. Clamp one end of the second cable to the negative “-” terminal of the good (charged) battery and the final connection (to any solid, stationary metallic object) on the engine at least 450 mm (18 in) from the discharged battery; or the frame rail, chassis or some other well-grounded point, if the battery is mounted outside the engine compartment. Make sure the cables are not on or near pulleys, fans, or other parts that will move when the engine is started.
5. Start the engine of the vehicle with the good (charged) battery and run the engine at a moderate speed for several minutes. Then, start the engine of the vehicle that has the discharged battery.
6. Remove the jumper cables by reversing the above installation sequence exactly. While removing each clamp, take care that it does not touch any other metal while the other end remains attached.

## TOWING PROCEDURE

- Proper equipment must be used to prevent damage to vehicles during any towing. State (provincial in Canada) and local laws that apply to vehicles in tow must be followed.
- Vehicles should not be towed at speeds in excess of 55 mph (90 km/h).
  - Connect to the main structural parts of the vehicle.
  - DO NOT attach to bumpers, tow hooks or brackets.
  - Use only equipment designed for this purpose.
  - Follow the instructions of the wrecker manufacturer.
  - A safety chain system must be used.
  - The procedures below must be followed when towing, to prevent possible damage.

### Front End Towing (Front Wheels Off Ground)

To prepare a disabled vehicle for front end towing with front wheels raised off the ground, the following steps are necessary:

- Block the rear wheels of the disabled vehicle.
  - Disconnect the propshaft at the rear axle or transmission. Secure the propshaft to the frame or crossmember.
  - Place 5 inch x 5 inch wood beam against the towing guide behind the bumper. (If no 5 inch x 5 inch is available, then remove the bumper.) Ensure towing chains do not contact the horns or the bumper.
- If there is damage or suspected damage to the rear axle, remove the drain plug from the axle case and drain the oil (approx. 6 liters/13 pints) then remove the axle shafts. Cover the hub openings to

prevent the loss of lubricant or entry of dirt or foreign objects.

**After Towing**

After towing the vehicle, block the rear wheels and install axle and propeller shafts. Apply the parking brake before disconnecting from the towing vehicle.

Check and fill rear axle with oil if required.

**Front End Towing  
(All Wheels On The Ground)**

Your vehicle may be towed on all wheels provided the steering is operable. Remember that power steering and brakes will not have power assist. There must be a tow bar installed between the towing vehicle and the disabled vehicle.

To prepare a disabled vehicle for front end towing with all wheels on the ground, the following steps are necessary.

- Block the wheels of the disabled vehicle.
- Disconnect the propshaft at the transmission or rear axle. Before disconnect the propshaft yoke from the transmission or the drive pinion flange, apply the setting mark between the yoke and the flange. Secure the propshaft to the frame or crossmember. (Manual Transmission Models) Move the selector into "N" position, vehicles can be towed at the speeds below 30 mph (48km/h) and up to the distance less than 50 miles (80km). (Automatic Transmission models)
- Provide wood blocking to prevent towing chains and bar from contacting the bumper.

If there is damage or suspected damage to the rear axle, remove the drain plug from the axle case and drain the oil (approx. 6 liters/13 pints) then remove the axle shaft. Cover the hub openings to prevent the loss of lubricant or entry of dirt or foreign objects.

**After Towing**

After towing the vehicle, block the rear wheels and install axle and propeller shafts. Apply the parking brake before disconnecting from the towing vehicle.

Check and fill rear axle with oil if required.

**Rear End Towing**

When towing a vehicle with rear wheels raised, secure the steering wheel to maintain straight-ahead position. Make certain that the front axle is not loaded above the front axle Gross Axle Weight Rating (GAWR) as indicated on the vehicle's VIN and Weight Rating Plate.

**Special Towing Instructions**

1. All state and local laws regarding such items as

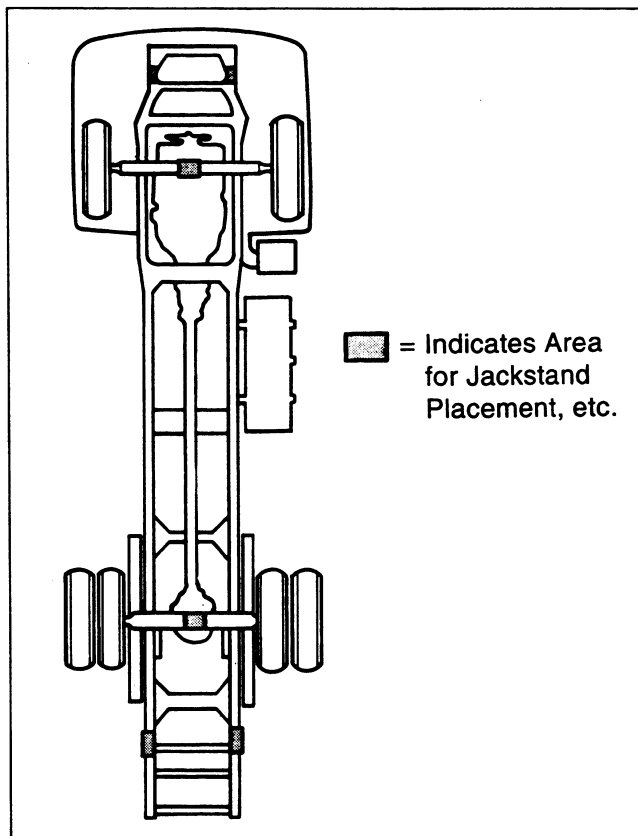
warning signals, night illumination, speed, etc., must be followed.

2. Safety chains must be used.
3. No vehicle should ever be towed at over 55 mph (90 km/h).
4. Loose or protruding parts of damaged vehicles should be secured prior to moving.
5. A safety chain system completely independent of the primary lifting and towing attachment must be used.
6. Operators should not go under a vehicle that is being lifted by the towing equipment unless the vehicle is adequately supported by safety stands.
7. No towing operation that for any reason jeopardizes the safety of the wrecker operator or any bystanders or other motorists should be attempted.

**VEHICLE LIFTING POINTS**

Figure 10 shows the jack stand placement points.

**CAUTION: To help avoid personal injury when a vehicle is on a jackstand provide additional support for the vehicle at the opposite end from which components are being removed. This will reduce the possibility of the vehicle falling off of the stand.**



**Figure 10. Vehicle Lifting Points**

**ABBREVIATIONS CHARTS****LIST OF AUTOMOTIVE ABBRIVIATIONS WHICH MAY BE USED IN THIS MANUAL**

A – Ampere (s)	DVOM – Digital Volt Ohmmeter
ABS – Antilock Brake System	EBCM – Electronic Brake Control Module
AC – Alternating Current	ECM – Engine Control Module
A/C – Air Conditioning	ECT – Engine Coolant Temperature
ACCEL – Accelerator	EEPROM – Electronically Erasable Programmable Reed Only Memory
ACC – Accessary	EGR – Exhaust Gas Recirculation
ACL – Air Cleaner	EI – Electronic Ignition
Adj – Adjust	ETR – Electronically Tuned Receiver
A/F – Air Fuel Ratio	EVAP – Evaporation Emission
AIR – Secondary Air Injection System	Exh – Exhaust
Alt – Altitude	°F – Degrees Fahrenheit
AMP – Ampere (s)	Fed – Federal (All States Except Calif.)
ANT – Antenna	FF – Front Drive Front Engine
ASM – Assembly	FL – Fusible Link
A/T – Automatic Transmission/Transaxle	FLW – Fusible Link Wire
ATDC – After Top Dead Center	FP – Fuel Pump
ATF – Automatic Transmission Fluid	FRT – Front
Auth – Authority	ft – Foot
Auto – Automatic	FWD – Front Wheel Drive
BARO – Barometric Pressure	4WD – Four Wheel Drive
Bat – Battery	4 × 4 – Four Wheel Drive
Bt – Battery Positive Voltage	4 A/T – Four Speed Automatic Transmission/ Transaxle
Bbl – Barrel	Gal – Gallon
BHP – Brake Horsepower	GEN – Generator
BPT – Backpressure Transducer	GND – Ground
BTDC – Before Top Dead Center	Gov – Governor
°C – Degrees Celsuis	g – Gram
CAC – Charge Air Cooler	Harn – Harness
Calif – California	HC – Hydrocarbons
cc – Cubic Centimeter	HD – Heavy Duty
CID – Cubic Inch Displacement	Hg – Hydrargyrum (Mercury)
CKP – Crankshaft Position	HiAlt – High Altitude
CL – Closed Loop	HO2S – Heated Oxygen Sensor
CLCC – Closed Loop Carburetor Control	HVAC – Heater-Vent-Air Conditioning
CMP – Camshaft Position	IAC – Idle Air Control
CO – Carbon Monoxide	IAT – Intake Air Temperature
Coax – Coaxial	IC – Integrated Circuit – Ignition Control
Conn – Connector	ID – Identification – Inside Diameter
Conv – Coverter	IGN – Ignition
Crank – Crankshaft	INJ – Injection
Cu.In. – Cubic Inch	IP – Instrument Panel
CV – Constant Velocity	IPC – Instrument Panel Cluster
Cyl – Cylinder (s)	Int – Intake
DI – Distributor Ignition	ISC – Idle Speed Control
Diff – Differential	J/B – Junction Block
Dist – Distributor	kg – Kilograms
DLC – Data Link Connector	km – Kilometers
DOHC – Double Overhead Camshaft	km/h – Kilometer per Hour
DTC – Diagnostic Trouble Code	
DTM – Diagnostic Test Mode	
DTT – diagnostic Test Terminal	
DVM – Digital Voltmeter (10 meg.)	



Kpa – KiloPascals	RPM – Revolutions per Minute
KV – Kilovolts (Thousands of Volts)	PRM Sensor – Engine Speed Sensor
KW – Kilowatts	RPO – Regular Production Option
KS – Knock sensor	RR – Right Rear
L – Liter	RS – Right Side
lb-ft – Foot Pounds	RTV – Room Temperature Vulcanizing
lb-in – Inch Pounds	RWAL – Rear Wheel Antilock Brake
LF – Left Front	RWD – Rear Wheel Drive
LH – Left Hand	SAE – Society of Automotive Engineers
LR – Left Rear	Sec – Secondary
LS – Left Side	SFI – Sequential Multiport Fuel Injection
LWB – Long Wheel Base	SI – System International
L-4 – In-line Four Cylinder Engine	SIR – Supplemental Inflatable Restraint System
MAF – Mass Air Flow	SOHC – Single Overhead Camshaft
MAN – Manual	Sol – Solenoid
MAP – Manifold Absolute Pressure	SPEC – Specification
Max – Maximum	Speedo – Speedometer
MC – Mixture Control	ST – Start
MFI – Multiport Fuel Injection	– Scan Tool
MIL – Malfunction Indicator Lamp	Sw – Switch
Min – Minimum	SWB – Short Wheel Base
mm – Millimeter	SYN – Synchronize
MPG – Miles per Gallon	Tach – Tachometer
MPH – Miles per Hour	TB – Throttle Body
M/T – Manual Transmission/Transaxle	TBI – Throttle Body Fuel Injection
MV – Millivolt	TCC – Torque Converter Clutch
NA – Natural Aspirated	TCM – Transmission Control Module
NC – Normally Closed	TDC – Top Dead Center
N·m – Newton Meter	Term – Terminal
NO – Normally Open	TEMP – Temperature
NOx – Nitrogen, Oxides of	TP – Throttle Position
OBD – On-Board Diagnostic	TRANS – Transmission/Transaxle
OD – Outside Diameter	TURBO – Turbocharger
O/D – Over Drive	TVRS – Television & Radio Suppression
OHC – Overhead Camshaft	TVV – Thermal Vacuum Valve
OL – Open Loop	TWC – Three Way Catalytic Converter
O <sub>2</sub> – Oxygen	3 A/T – Three Speed Automatic Transmission/ Transaxle
O <sub>2</sub> S – Oxygen Sensor	2WD – Two Wheel Drive
PAIR – Pulsed Secondary Air Injection System	4 × 2 – Two wheel Drive
P/B – Power Brakes	U-joint – Universal Joint
PCM – Powertrain Control Module	V – Volt (s)
PCV – Positive Crankcase Ventilation	VAC – Vacuum
PRESS – Pressure	VIN – Vehicle Identification Number
PROM – Programmable Read Only Memory	VRRRE – Vehicle Refrigerant Recovery and Recycling Equipment
PNP – Park/Neutral Position	V-ref – ECM Reference Voltage
P/S – Power Steering	VSS – Vehicle Speed Sensor
PSI – Pounds per Square Inch	VSV – Vacuum Switching Valve
PSP – Power Steering Pressure	V-6 – Six Cylinder “V” Engine
Pt. – Pint	V-8 – Eight Cylinder “V” Engine
Pri – Primary	W – Watt (s)
PWM – Pulse Width Modulate	w/ – With
Qt – Quart	w/b – Wheel Base
REF – Reference	w/o – Without
RF – Right Front	WOT – Wide Open Throttle
RFI – Radio Frequency Interference	
RH – Right Hand	

**ESSENTIAL SERVICE TOOLS**

Essential service tools that are shown in this service manual that have tool product numbers beginning with "J" are available for worldwide distribution form:

Kent-Moore

SPX Corporation

29784 Little Mack

Roseville, ML 48066-2298

1-800-328-6657

Mon.-Fri. 8:00 p.m. EST

Telex: 244040 KMTR VR

FAX-313-578-7375

SECTION 0B

MAINTENANCE AND LUBRICATION

**NOTICE:** When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

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LUBRICATION DETAIL INFORMATION

**ENGINE OIL AND VISCOSITY RECOMMENDATIONS**

The oil industry markets various types of engine oil under certain service designation and specification numbers.

The selection of a reliable supplier and close attention to the oil and filter element change recommendations can provide satisfactory lubrication and longer life for the engine.

Using the proper engine oil and following the recommended oil change intervals is your best assurance of continued reliability and performance from your vehicle's engine.

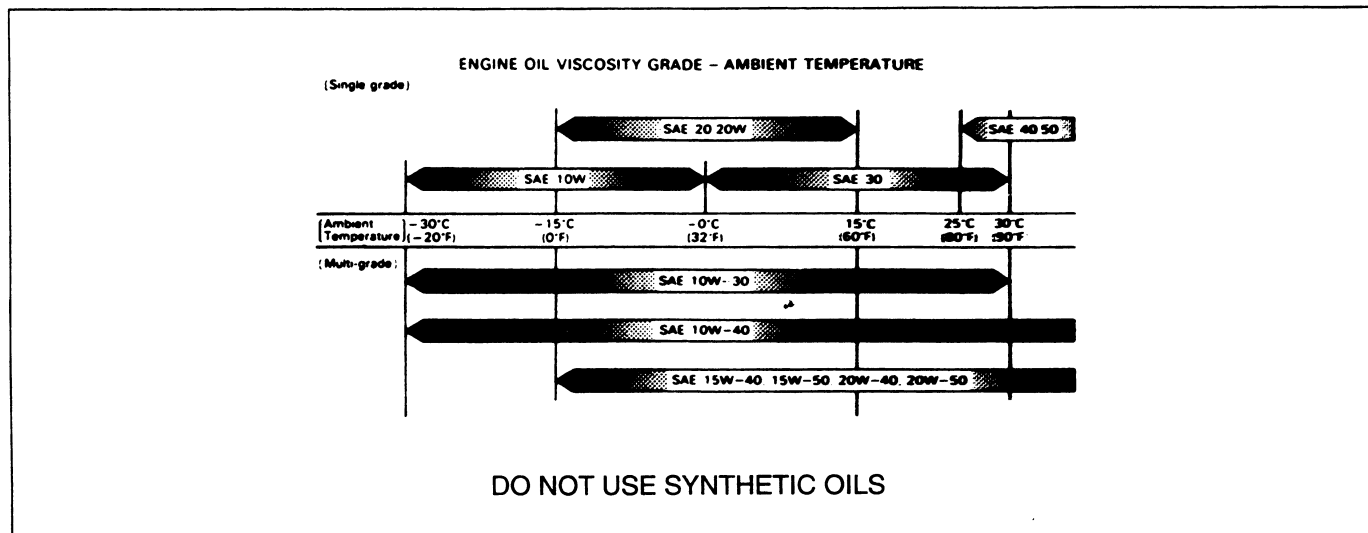
Engine oil containers are labeled with various API(American Petroleum Institute) designations of

quality. Be sure the oil you use has the API designation "CD", either alone or shown with other designations such as "SF/CD". Oils which are not labeled "CD" should not be used. For example, **do not use oils labeled only SA, SB, SC, SD, SE, CA, CB, CC, or oils with a combination of any of these letters—such as SE/CC, as this may cause engine damage.**

**DO NOT USE SYNTHETIC OILS.**

**Diesel Engine Oil Viscosities**

Viscosity numbers make up a classification of lubricants in terms of fluidity or viscosity, but with no reference to any other characteristics or properties.



**Figure 1. Oil Viscosity Chart**

Where cold weather starting is a problem, it is suggested that oil and coolant system heaters, as well as proper fuel selection, will be helpful. However, if these are not available, lighter viscosity oils may be used only to facilitate starting. Do not use starting aids in the air intake system. Such "aids" can cause immediate engine damage.

The engine oil viscosity specification depends on the temperature of the engine oil at the time of starting the engine. Viscosity recommendations for various starting temperatures are shown in the "Viscosity Chart".

When choosing an oil, consider the range of temperature your vehicle will operate in before the next oil change. Then, select the recommended oil viscosity from the chart (figure 1).

### **Diesel Break-In Oils And Additives**

The use of proprietary blends of supplementary additives or concentrates such as engine oil supplements, break-in oils, tune-up compounds, friction reducing compounds, etc., is not recommended in lubricating oils of the diesel engine in these vehicles.

### **Change Intervals**

The oil and oil filter change intervals for the engine are based on the use of CD-quality oil and high-quality filters. **Using oil other than CD-quality, or not changing oil and filter often enough could reduce engine life.** Damage to engines due to improper maintenance or use of incorrect oil quality and/or viscosity is not covered by the warranty.

# MAINTENANCE SCHEDULE

MAINTENANCE SCHEDULE FOR NPR/W4/4000

No.	Item	Interval (kilometers)		Service Intervals Months or Miles (kilometers) whichever comes first
		Interval (kilometers)	Interval (Miles)	
1	Engine Noise Check	10 400	6,500	I
2	Idle Speed	20 800	13,000	I
3	Valve Lash	31 200	19,500	I
4	Injection Timing	41 600	26,000	I
5	Engine Speed Governor (fuel set)	52 000	32,500	I
6	Injection Nozzle	62 400	39,000	I
7	Engine Oil & Oil Filter	72 800	45,500	I
8	Fuel Filter	83 200	52,000	I
9	Air Cleaner Filter	93 600	58,500	I
10	Air Intake system	104 000	65,000	I
11	Drive Belt	114 400	71,500	I
12	Engine Bolt Torque	124 800	78,000	I
		135 200	84,500	I
		145 600	91,000	I
		156 000	97,500	I
		166 400	104,000	I

(I): Inspect, replace or adjust if necessary (A): Adjust (R): Replace (T): Tighten to specified torque (L): Lubricate  
 \* Initial Torque check at 650 miles is required.

## MAINTENANCE SCHEDULE (CONT.)

MAINTENANCE SCHEDULE FOR NPR/W4/4000 (CONT.)

No.	Item	Interval (kilometers)		Service Intervals Months or Miles (kilometers) whichever comes first
		Interval (Miles)		
13	Turbocharger			
14	Rotate Tires			R
15	Engine Cooling System			I or every 12 months
16	Exhaust System			I
17	Fuel Line System			I or every 12 months
18	Brake Lining and Pad for Wear			I
19	Brake Drum for Wear and Damage			I or every 12 months
20	Brake Fluid			I or every 12 months
21	Brake Line LSV and Hoses			I or every 12 months
22	Clutch Pedal Free Travel			I or every 12 months
23	Manual Transmission Oil			I or every 12 months
24	Automatic Transmission Fluid			I or every 12 months
		166 400	104,000	R
		156 000	97,500	R
		145 600	91,000	R
		135 200	84,500	R
		124 800	78,000	R
		114 400	71,500	R
		104 000	65,000	R
		93 600	58,500	R
		83 200	52,000	R
		72 800	45,500	R
		62 400	39,000	R
		52 000	32,500	R
		41 600	26,000	R
		31 200	19,500	R
		20 800	13,000	R
		10 400	6,500	R

(I): Inspect, replace or adjust if necessary      (A): Adjust      (R): Replace      (T): Tighten to specified torque      (L): Lubricate

**MAINTENANCE SCHEDULE (CONT.)**

**MAINTENANCE SCHEDULE FOR NPR/W4/4000 (CONT.)**

No.	Item	Interval (kilometers)	Interval (Miles)	Service Intervals Months or Miles (kilometers) whichever comes first	
				or every 12 months	or every 24 months
25	Differential Gear Oil			R	
26	Power Steering Fluid				R
27	Steering Gear Box Torque				T
28	Propeller Shaft Flange Torque			T	
29	Leaf Spring U-Bolt Torque*				T
30	Wheel Nut Torque*			T	
31	Steering Shaft and Drag Link			L	L
32	King Pin			L	L
33	Propeller shaft				L
34	Wheel Bearing Grease				R
35	Rear Spring Pins			L	L

(I): Inspect, replace or adjust if necessary (A): Adjust (R): Replace (T): Tighten to specified torque (L): Lubricate

\* Initial Torque check at 650 miles is required.

## EXPLANATION OF COMPLETE VEHICLE MAINTENANCE SCHEDULE

The following is a brief explanation of the service listed in the preceding Complete Vehicle Maintenance Schedule.

### NORMAL VEHICLE USE

The vehicle maintenance instructions in the Maintenance Schedule are based on the assumption that the vehicle will be used as designed:

- to carry passengers and cargo within the limitations specified on the tire placard.
- to be driven on reasonable road surfaces within legal operating limits.
- to be driven on a daily basis, as a general rule,

for at least several mile/kilometers.

- to be driven on proper fuel (See Owner's Manual; Diesel Fuel Requirement.).

Unusual operating conditions will require more frequent vehicle maintenance, as specified in the following section.

- 1. ENGINE NOISE**—These components have an effect on the control of noise emissions.
- 2. IDLE SPEED** — Check adjust the engine idle speed at first 6,500 miles (10 400 km) and every 52,000 miles (83 200 km). Adjustments must be made with test equipment known to be accurate.

Engine (Every 6,500 miles or 10 400 km)	Inspection sound absorption materials for tears, broken out sections or attachment. Repair or replace as necessary.
Cooling system (Every 13,000 miles or 20 800 km)	Inspection fan, shroud and radiator for attachment, tears or cleanliness. Repair or replace as necessary.
Air intake system (Every 26,000 miles or 41 600 km)	Inspect all ducts, hoses and intake silencers for leaks or chafing. Repair or replace as necessary.
Exhaust system (Every 6,500 miles or 10 400 km)	Inspect silencer, pipes, gaskets, clamps and mounting for exhaust gas leaks or looseness. Repair or replace as necessary.
Cab (Every 6,500 miles or 10 400 km)	Inspect sound absorption materials for tears, broken out sections or attachment. Repair or replace as necessary.

**3. VALVE LASH** — Incorrect valve clearance will result in increased engine noise and lower engine output, thereby adversely affecting engine performance. Retorque rocker shaft bracket nuts before checking and adjusting valve clearance. Check and adjust valve clearance at every 52,000 miles (83 200 km).

**4. INJECTION TIMING** — Incorrect injection timing could result in increased exhaust emission or smoke emission, or lower engine output. Check and adjust injection timing every 52,000 miles (83 200 km)

**5. ENGINE SPEED GOVERNOR** — Fuel rate influences engine output, exhaust emission and smoke emission. Have the engine speed governor checked and adjusted by ZEXEL corporation or authorized service center at every 52,000 miles (83 200 km).

**6. INJECTION NOZZLE** — Check and adjust

injection opening pressure and nozzle spray condition at every 52,000 miles (83 200 km).

- 7. ENGINE OIL AND OIL FILTER** — Change at interval noted below depending upon driving conditions.
- **NORMAL SERVICE** — Change every 6,500 miles (10 400 km) or 12 months whichever occurs first.
  - **SEVERE SERVICE** — Change every 3,600 miles (5 760 km) or 3 months if the vehicle is often driven under one or more of these conditions (a) driving in dusty areas, (b) frequent idling or idling for long periods, (c) driving four miles (6 km) or less in freezing weather, or other short trips in cold weather, where engine dose not thoroughly warm up. Change oil and filter soon after driving in a dust storm.

**8. FUEL FILTER** — Replace filter at every 13,000 miles (20 800 km) or 12 months whichever



occurs first, or more frequently if clogged. Drain water from the water separator every 6,500 miles (10 400 km).

**9. AIR CLEANER FILTER** — Replace the engine air cleaner filter under normal operations every 26,000 miles (41 600 km). Operation of vehicle in dusty areas will necessitate more frequent filter replacement.

**10. AIR INTAKE SYSTEM** — Check if air cleaner hoses and ducts are connected and correctly installed every 26,000 miles (41 600 km).

**11. DRIVE BELT** — Check belt driving the fan, generator at every 52,000 miles (83 200 km). Look for cracks, fraying, wear, and proper tension.

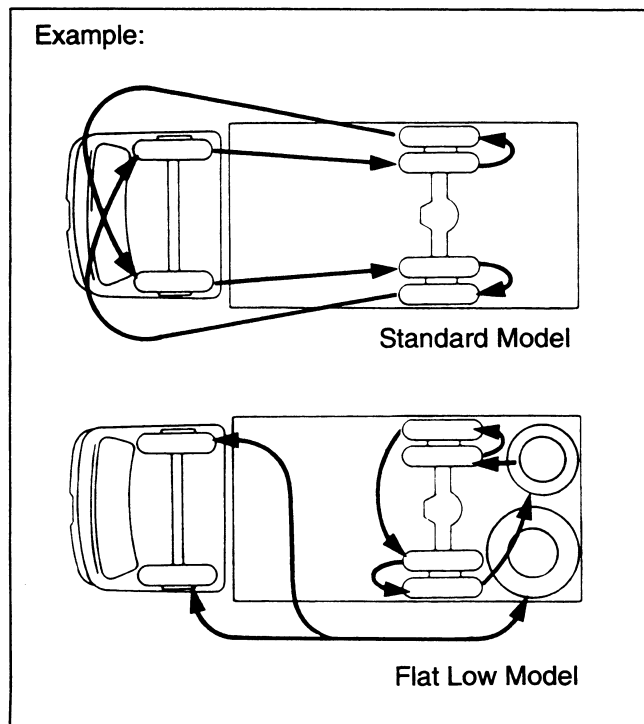
Replace at every 104,000 miles (166 400 km).

**12. ENGINE BOLT TORQUE** — Loosened bolts result in lower engine output. Check and adjust manifold mounting, and injection nozzle to correct torque every 52,000 miles (83 200 km). Specified tightening torque

INTAKE/EXHAUST, MANIFOLDS	19 N·m (14 lb·ft)
INJECTION NOZZLE	64 N·m (47 lb·ft)

**13. TURBOCHARGER** — Check abnormal noise generated during rotation. Check turbocharger mounting, water line and oil line for looseness, leakage restriction or damage.

**14. ROTATE TIRES** — To equalize wear, rotate tires and adjust tire pressures at every 6,500 miles (10 400 km).



**Figure 2. Rotate Tires**

**15. ENGINE COOLING SYSTEM** — At 12 months or 6,500 miles (10 400 km) intervals, wash radiator cap and filler neck with clean water, pressure test system and radiator cap for proper pressure holding capacity, tighten hose clamps and inspect condition of all cooling and heater hoses. Replace hoses if cracked, swollen or otherwise deteriorated.

Also each 12 months or 6,500 miles (10 400 km), clean exterior of radiator core and if necessary, drain, flush and refill the engine cooling system with a new engine coolant solution as described in the Owner's Manual.

**16. EXHAUST SYSTEM** — Check the complete exhaust system at every 6,500 miles (10 400 km). Check body areas near the exhaust system.

Look for broken, damaged, missing, or out-of-position parts. Also inspect for open seams, holes, loose connections, or other conditions which could cause a heat build-up in the floor pan, or could let exhaust fumes seep into the passenger compartment. Dust or water in the cabin may indicate a leak in the area. Needed repairs should be made at once.

**17. FUEL LINE SYSTEM** — Inspect the fuel tank, cap and lines for damage which could cause leakage at every 13,000 miles (20 800 km). Inspect fuel cap for correct sealing ability and indications of physical damage. Replace any damaged or malfunctioning parts.

**18. BRAKE LINING AND PAD FOR WEAR** — Check drum brake lining or disc brake pad (if so equipped) for wear or cracks at every 6,500 miles (10 400 km). Check brakes (including parking brake) more often if conditions and habits result in frequent braking.

Front disc brake (if so equipped) have built-in wear indicators which are designed to make a high pitched squeal or cricket-like warning sound when the brake pads are worn to the point where new pads are needed.

When the vehicle is in motion, the sound may be constant or it may come and go. Pressing the brake pedal firmly may cause the sound to stop.

Have the brake linings or the brake pads replaced, if these conditions exist.

Failure to do so can result in expensive damage to the brake system or a serious accident.

**19. BRAKE DRUM FOR WEAR AND DAMAGE** — Check brake drums (front, rear and parking) for wear or damage at every 26,000 mile (41 600 km) or 12 months whichever occurs first.

**20. BRAKE FLUID** — Check the fluid in brake fluid reservoir at every 6,500 miles (10 400 km).

**21. BRAKE LINE, LSV AND HOSES** — Check lines and hoses for proper hook-up, binding,

leaks, cracks, chafing, etc. every 26,000 miles (41 600 km). Any questionable parts should be replaced or repaired at once. When rubbing or wear is noted on lines or hoses, the cause must be corrected at once.

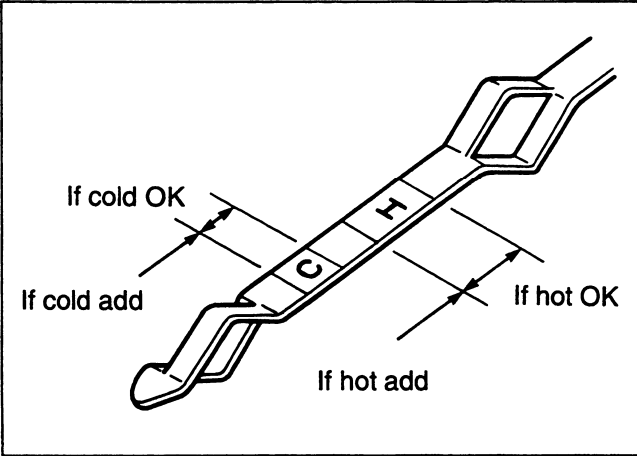
**22. CLUTCH PEDAL CONTROL** — Check lines and hoses for proper hook-up, binding leaks, cracks, chafing, etc. at every 13,000 miles (20 800 km). Any questionable parts should be replaced or repaired.

**23. MANUAL TRANSMISSION OIL** — Replace lubricant at every 19,500 miles (31 200 km). Check lubricant level at every 6,500 miles (10 400 km), and add lubricant to level of filler hole if necessary.

**24. AUTOMATIC TRANSMISSION FLUID (ATF)** — Check the ATF at each engine oil change and replace fluid every 26,000 miles (41 600 km). To check the fluid level, first set the parking brake, then start the engine in “P” position. With the regular brakes applied, move the selector through all the gear position, ending with “P”. You must check the ATF level with the engine running at slow idle and the truck must be on a level surface.

**NOTICE:** If you have driven for a prolonged period of time or in city traffic in hot weather, wait until the fluid cools down (Approx. 30 minutes) before checking ATF level.

Remove the dipstick located at the rear right side of the engine. Carefully touch the wet end of the dipstick to find out if the ATF is cool, warm or hot. Wipe it clean and push it back in until the cap seats. Pull out the dipstick and read the ATF level.

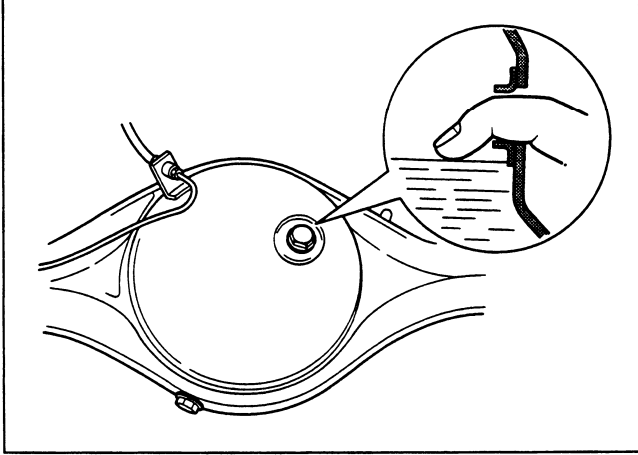


**Figure 3. ATF Level Check**

- If it felt cool, about room temperature, the level should be in the “C” range.
- If it felt warm, about normal operating

temperature of 158° to 176° F(70° to 80°C), the level should be in the “H” range.

**25. DIFFERENTIAL GEAR OIL** — Replace lubricant at every 26,000 miles (41 600 km). Check lubricant level at every 6,500 miles (10 400 km) or every 12 months, and add lubricant to within 0 to 10 mm (0 to 0.4 in) of bottom edge of the filler hole if necessary.



**Figure 4. Differential Gear Oil Level**

**26. POWER STEERING FLUID** — Replace power steering fluid every 24 months or 32,500 miles (52 000 km), whichever occurs first.

**27. STEERING GEAR BOX TORQUE** — Retighten the fixing bolts of the steering gear box to the specified torque at every 26,000 miles (41 600 km).

Specified tightening torque  
**STEERING GEAR BOX** 102 N·m  
 (75 lb·ft)

**28. PROPELLER SHAFT FLANGE TORQUE** — Check the fixing bolts of propeller shaft flange for looseness or damage at first 6,500 miles (10 400 km). Retighten the fixing bolts to the specified torque at every 13,000 miles (20 800 km).

Specified tightening torque  
**PROPELLER SHAFT FLANGE** 102 N·m  
 (75 lb·ft)

**29. LEAF SPRING U-BOLT TORQUE** — Tighten the U-Bolt nuts to the specified torque at 650 miles (1 050 km), 6,500 miles (10 400 km) and thereafter each 13,000 miles (20 800 km).

Specified tightening torque  
**LEAF SPRING U-BOLT** Front 127 N·m  
 (94 lb·ft)  
 Rear 177 N·m  
 (130 lb·ft)

**30. WHEEL NUT TORQUE** — Check tire for excessive or abnormal wear, or damage. Also check tire inflation pressures and adjust. Be sure wheels are not bent or cracked and that

wheel nuts have been tightened to the specified torque at 650 miles (1 050 km) and then every 6,500 mile (10 400 km). Refer to Section 3 for the specified torque.

Specified tightening torque  
 Front and Rear wheel 440 N·m  
 (325 lb·ft)

**31. TEERING SHAFT AND DRAG LINK —**

Lubricate the grease fittings on the steering shaft and drag link at 12 months or 6,500 miles (10 400 km) whichever occurs first.

**32. KING PIN —** Lubricate the grease fitting on the king pins at 12 months or 6,500 miles (10 400

km) whichever occurs first.

**33. PROPELLER SHAFT —** Lubricate the grease fitting on each universal joint and spline coupling at 12 months or 13,000 miles (20 800 km) whichever occurs first.

**34. WHEEL BEARING GREASE —** Clean and repack front wheel bearings at every brake relining or 32,500 miles (52 000 km) whichever comes first.

**35. REAR SPRING PINS —** Lubricate the grease fitting on the rear spring pins every 6,500 miles (10 400 km).

## OWNER SAFETY AND ROUTINE MAINTENANCE

Listed below are vehicle checks which should be made periodically by either the owner or a qualified technician to ensure proper performance and safety of the vehicle.

**For your safety and that of others, any of the safety-related components that may have been damaged in an accident should be checked and necessary repairs performed before operating the vehicle.**

At the minimum, these routine checks should be made every 6 months or 6,000 miles (10 000 km), whichever comes first. Whenever repairs are necessary, have them completed before operating the vehicle.

**A PARKING BRAKE —** Park on a fairly steep hill and hold the vehicle with the parking brake only. This checks holding ability.

Before checking item (B), be sure to have enough room around the vehicle. Then firmly apply both the parking brake and the regular brake.

Do not use the accelerator pedal. If the engine starts, be ready to turn off the ignition/engine control switch at once. Take these precautions because the vehicle could move without warning and possibly cause person injury or property damage.

**B STARTER SAFETY SWITCH (AUTOMATIC TRANSMISSION) —** Check by trying to start the engine in each gear. The starter should crank only selector position “P” or “N.”

**C TRANSMISSION SHIFT INDICATOR (AUTOMATIC TRANSMISSION) —** Check that the indicator points to the gear chosen.

**D STEERING —** Be alert for any changes in steering action. An inspection or service is needed when the steering wheel is harder to turn or has too much free play, or when there are strange sounds when turning or parking.

**E WHEEL ALIGNMENT, BALANCE, AND TIRES —** Check tires for abnormal wear or damage.

Also, check for damaged wheels. A pull right or left on a straight and level road may show the need for a wheel alignment. A vibration of the steering wheel or seat at normal highway speeds may mean a wheel balancing is needed. Check tire pressure when the tires are “cold”, at least monthly, and whenever the vehicle is serviced. (Include the spare, if equipped.)

Check the pressure more often if daily check shows it’s needed. Change tire pressure as needed when changing loads.

**F BRAKES —** Be alert to illumination of the low vacuum warning light or for the tone alarm, or changes in braking action, such as repeated pulling to one side, unusual sounds when braking or increased brake pedal travel. Check regularly that the brake fluid reservoir is properly filled and check for fluid leaks. Any of these conditions could indicate the need for brake system inspection and/or service.

**G EXHAUST SYSTEM —** Be alert for any changes in the sound of the exhaust system or any smell of fumes. These are signs the system may be leaking. Have it checked and/or repaired at once.

**H WINDSHIELD WIPERS AND WASHERS —** Check operation and condition of the wiper blades. Check the flow and aim of the washer spray.

**I DEFROSTER —** Turn the control lever to “DEF” and the fan lever to “HI”. Then check the airflow from the ducts at the inside base of the windshield.

**J REARVIEW MIRRORS AND SUN VISORS —** Check that friction joints hold mirrors and sun visors in place.

**K HORN —** Sound the horn now and then to be sure it works.

**L LAP-SHOULDER BELTS —** Check seat belt system (including webbing, buckles, latch

plates, and anchors) for proper operation, and for damage.

- M SEAT ADJUSTERS** — When adjusting a manual seat, be sure seat adjusters latch by pushing the seat forward and backward.
- N LAMPS** — Check panel lighting, warning lamps, indicator lamps, and interior lamps. On the outside, check: license plate lamps, side marker lamps, reflectors on outside mirrors, headlamps, parking lamps, identification and clearance lamps, taillights, brake lamps, turn signals, backup lamps, and hazard warning flashers. Have headlamp aim checked at once if beams seem improperly aimed.
- O GLASS, MIRRORS, LIGHTS AND/OR REFLECTORS CONDITION** — Look for broken, scratched, dirty or damaged glass, mirrors, lamps or reflectors that could reduce the view or visibility, or cause injury. Replace, clean or repair promptly.
- P DOOR LATCHES** — Check that doors close, latch, and lock tightly. Check for broken, damaged or missing parts that might prevent tight latching.

- Q TILT CAB** — Be sure the tilt lever is raised and the lock pin is inserted in the lever bracket.
- R FLUID LEAKS** — Check for fuel, water, oil, or other fluid leaks by looking at the surface beneath the vehicle after it has been parked for a while. If you notice diesel fumes or fluid at any time, have the cause found and corrected at once.
- S SPARE AND JACK** — Check that spare tire assembly and jack equipment (if equipped) are securely stowed at all times.
- T UNDERBODY** — Corrosive materials used for ice removal, snow removal, and dust control can collect on the underbody. If these materials are not removed, accelerated corrosion (rust) can occur on underbody parts such as fuel lines, frame, floor pan, and exhaust system. At least every spring, flush these materials from the underbody with plain water. Take care to clean well any areas where mud and other debris can collect. Sediment packed in closed areas of the frame should be loosened before being flushed.

## NOISE EMISSION CONTROL

### NOISE CONTROL SYSTEM

The following information relates to compliance with Federal noise emission standards for vehicles with a Gross Vehicle Weight Rating (GVWR) of more than 4,536 kg (10,000 lb). The Maintenance Schedule provides information on maintaining the noise control system to minimize wear of the noise emission control system during the life of the vehicle. The noise control system warranty is given in the vehicle Warranty Folder.

These standards apply only to vehicles sold in the United States.

### TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof:

1. The removal or rendering inoperative by any person other than for purposes of maintenance, repair or replacement of any device or element of design incorporated in any new vehicle for the purpose of noise control, prior to its sale or delivery to the ultimate purchaser or while it is in use.
2. The use of the vehicle after such device or

element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are acts listed below.

#### Insulation

- Removal of noise shields or underhood insulation.

#### Engine

- Removal or rendering engine speed governor, if so equipped, inoperative so as to allow engine speed to exceed manufacturer specifications.

#### Fan and Drive

- Removal of fan clutch, if so equipped, or rendering clutch inoperative.
- Removal of fan shroud, if so equipped.

#### Air Intake

- Removal of air cleaner silencer.
- Reversing air cleaner cover.

#### Exhaust

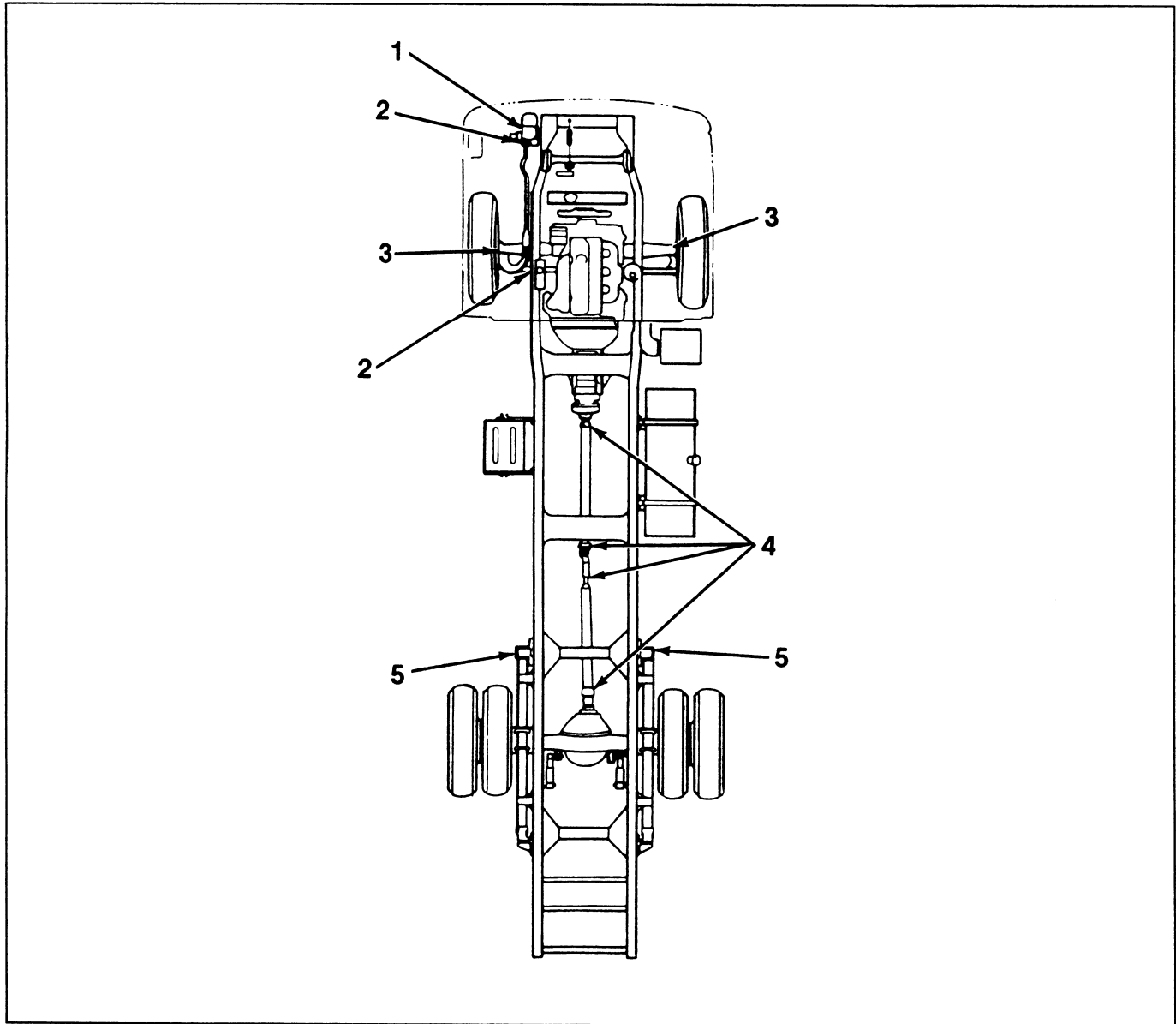
- Removal of muffler and/or resonator.
- Removal of exhaust pipes and exhaust pipe clamps.

**RECOMMENDED FLUIDS AND LUBRICANTS**

<b>USAGE</b>	<b>FLUIDS/LUBRICANTS</b>
Engine Oil	SG/CE, SF/CD, SE/CD, CD Engine Oil
Manual Transmission Oil	SAE 5W-30 SF below 32 °C (90 °F) or SAE 40 engine oil above 32 °C (90 °F)
Automatic Transmission Fluid	ATF Dexron® II
Rear Axle	Multi-purpose gear oil SAE90 GL-5
Chassis Lubricant	Multi-purpose grease with high temperature, good quality, lithium soap, extreme pressure grease
Battery Terminals	Petroleum Jelly
Clutch and Brake Fluid	Brake fluid DOT 3 or equivalent
Cab-Door Hinges and Latches Lubricant	A semi-fluid grease having extreme pressure properties and containing zinc oxide (Lubricant or equivalent)
Power Steering Fluid	ATF Dexron® or Dexron® II
Engine Coolant	Mixture of water and high quality ethylene glycol base type antifreeze
Windshield Washer Solvent	Washer Solvent
Propeller Shaft, Universal Joints and Sliding Sleeve Lubricant	NLG #1 or #2 multi-purpose type grease
Clutch Mini-Pack Oil	Vacuum Cylinder Oil
Propeller Shaft Center Bearing, Wheel Hub Bearing Lubricant	NLG1 #2 or #3

## LUBRICATION CHART

<b>GREASE POINTS</b>	<b>REMARKS</b>
1. Steering Slip Shaft	— 1 fitting
2. Steering Drag Link	— 2 fittings
3. King Pins	— 4 fittings
4. Propeller Shaft Universal Joints and Sliding Sleeve	— 4 fittings
5. Rear Spring Pins	— 2 fittings



**Figure 5. Grease Points Chart**

**SPECIFICATIONS**

**CAPACITIES**

**Engine Crankcase**

This capacity is for a normal refill and it is an approximate amount. Keep the level as close as possible to the full mark without overfilling. Do not operate with the level below the low mark.

4BD2-TC ..... 11.2 *l* (3.0 gal)

This figure includes the full-flow oil filter, which should be changed at each oil change.

**Engine Cooling System**

Capacity ..... 17 *l* (4.5 gal)

Thermostat ..... 82 °C (180 °F)

Radiator Pressure Cap ..... 103 kPa (15.46 psi)

**Fuel Tank**

The fuel tank capacity is stated on a metal plate attached to the fuel tank body. Only fill the tank to 95 percent of its capacity. This allows room for expansion of the fuel.

**Transmission**

ELECTROMATIC (Includes oil cooler and pipings) ..... 13.5 *l* (3.6 gal)

MSA5D ..... 2.6 *l* (5.5 pt)

**Rear Axle**

Capacity ..... 9 *l* (2.4 gal)

**MAINTENANCE ITEM**

Air Cleaner (DONALDSON EGB10-8107) Filter ..... ISUZU Part No. 8-94430-250-0 GM Part No. 94430250

Engine Oil Filter Cartridge ..... ISUZU Part No. 8-97046-464-1 GM Part No. 97046464

Fuel Filter Cartridge ..... ISUZU Prst No. 8-94414-796-1 GM Part No. 94414796

**FASTENER TORQUES**

Intake and Exhaust Manifolds Nut and Bolts ..... 19 N·m ( 14 lb-ft)

Injection Nozzle ..... 64 N·m ( 47 lb-ft)

Steering Gear Box Fixing Nuts and Bolts ..... 102 N·m ( 75 lb-ft)

Propeller Shaft Flange Nuts ..... 102 N·m ( 75 lb-ft)

Leaf Spring U-Bolt Nuts ..... Front 127 N·m ( 94 lb-ft)

Rear 177 N·m (130 lb-ft)

Wheel Nuts ..... 440 N·m (325 lb-ft)