

VEHICLE MAINTENANCE AND SPECIFICATIONS



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Preface



WARNING: If the owner/operator of the vehicle is a skilled technician and intends to perform the vehicle maintenance and servicing, he/she is strongly urged to purchase and follow the appropriate service manuals. Failure to properly perform maintenance and servicing procedures could result in property damage, personal injury or death.

Your vehicle has been engineered and manufactured to provide economical and trouble free service. However, it is the owner's responsibility to see that the vehicle receives proper care and maintenance.

As with any vehicle, care should be taken to avoid being injured when performing maintenance or repairs or making any checks. Improper or incomplete service could result in the vehicle not working properly which, in turn, may result in personal injury or damage to the vehicle or its equipment. If you have any question about performing some service, have the service done by a skilled technician.

Maintenance Guidelines



WARNING: Failure to properly perform maintenance and servicing procedures could result in property damage, personal injury or death.



WARNING: Making any modifications to any part, component or system of the vehicle, can adversely affect the quality and reliability of your vehicle and must be avoided. Modifications to systems could result in property damage, personal injury or death.



WARNING: The use of inferior parts can adversely affect the quality and reliability of your vehicle, which could result in property damage, personal injury or death.



WARNING: To avoid property damage, personal injury or death, take care when performing any maintenance or making any check or repair. Some of the materials in this vehicle may also be hazardous if used, serviced, or handled improperly. If you have any questions pertaining to the service, have the work done by a skilled technician.



WARNING: To avoid property damage, personal injury or death when servicing the vehicle, park on a flat level surface, set the parking brake, turn off the engine, and chock the wheels.



WARNING: Always disconnect the ground battery terminal first, then the positive cable prior to electric welding. Attach the welder ground cable as close as possible to the part being welded. If welding close to an electrical component, temporarily remove that component. Failure to follow this warning could result in property damage, personal injury, or death.

When Servicing your vehicle always:

1. Turn off the ignition switch unless the procedure calls for a running engine.
2. Set the parking brake and chock the wheels.
3. Use support stands, not a jack, whenever you must be under a raised vehicle.
4. Do not smoke.
5. Wear safety glasses for eye protection.
6. Operate engine only in a well ventilated area.
7. Do not work on brakes unless proper precautions are taken to avoid inhaling friction material dust.

8. Do not wear loose clothing, hanging jewelry, watches or rings. Tie up long hair and avoid rotating machinery.
9. Avoid contact with hot metal parts; allow hot components to cool before working on them.
10. Correct any problems that were revealed during inspection, prior to operating the vehicle.

Supporting Your Vehicle for Service



WARNING: Always use floor stands to support the vehicle before working under it. Using only a jack could allow the vehicle to fall resulting in property damage, personal injury or death.

When performing service repairs on a vehicle, first:

1. Park vehicle on level concrete floor.
2. Set parking brake and/or block wheels to prevent vehicle from moving.
3. Select jack with a rated capacity sufficient to lift the vehicle.
4. Raise vehicle with jack applied to axle. (DO NOT use bumper as a lifting point.)
5. Support vehicle with floor stands under axle(s).

If axle or suspension components are to be serviced, support vehicle with floor stands under frame side members, preferably between the axles.

Axles

Front Axle

Front Axle Inspection and Lubrication

Check to make sure that the front axle mounting U-bolts, attaching or mounting bolts and nuts are securely tightened.

Front Axle (cont.)

Observe the following when checking the front axle for damaged, binding, or worn parts and adequate lubrication:

- * Kingpin wear inspection requires that no weight is on the tires.
- * Kingpin and Kingpin Bushing lubrication requires that the vehicle weight is off tires and the front wheels be turned fully to the left or right prior to installing grease distribution.
- * Kingpin Thrust Bushing lubrication requires that the vehicle weight is resting on the tires.
- * Power grease guns may be used, however, a hand-pumped grease gun is recommended for optimal grease distribution within each component joint.
- * Inspect, lubricate and adjust the wheel bearings at regular intervals. Refer to the axle service manual for recommend intervals.

Front Axle – Normal Maintenance

During operation, the air and oil inside the hub/wheel cavity expands. It is normal for a mist of oil to be present on the outside of the hubcap around the vent slit or hole. Over time, if not wiped off, this film may collect dust and appear unsightly. If the entire face and end of the hubcap become wet with oil, investigate the cause. Refer to the axle service manual for repair procedures.

Routinely clean the hubcap to ensure that the lube level can be easily observed through the clear window as intended. In situations where the window is clean on the outside but discolored on the inside, check the lube level by removing the rubber fill/vent plug and insert a finger into the hole.

The specified lube level for clear window type hubcaps is slightly above the minimum or add line.

If the lube level suddenly drops dramatically below the minimum level, see the axle service manual for diagnostic procedure.

Front Axle Alignment

Maintaining front axle alignment is very important to achieve maximum tire life and vehicle control. Inspecting steer axle tires in the first 1,500 to 3,000 service miles will generally show if tires are wearing normally.

Axles (cont.)

Front Axles (cont.)

Front Axle – Alignment (cont.)

- * Rapid outside shoulder wear on both tires indicates too much toe-in.
- * Rapid inside shoulder wear on both tires indicates too much toe-out.
- * Excessive wear on the inside or outside of one steer tire but not the other can indicate a toe-in or toe-out condition coupled with a misaligned front or rear axle.
- * Pulling to the right or left can indicate misalignment of the front or rear axle, unequal tire pressures, or a damaged/mismatched tire.

Refer to the TIRE manufacturer for additional related information.

Rear Axle

Rear Axle – Inspection and Lubrication

Make sure the axle mounting U-bolt nuts, attaching or mounting bolts and nuts, are securely tightened. Loose or misaligned rear axles will affect vehicle alignment, front tire wear, and handling. Refer to AXLE U-BOLT NUT TORQUE CHART for torque specifications.

Check the rear axle oil level. Proper oil level minimizes gear wear, heat and damage to the wheel bearings and seals. The oil level should be at the lower edge of the level inspection hole when the vehicle is on level ground. Add oil as necessary.

Refer to the axle manufacturers maintenance manual for additional information.

Air Brakes

Brake Inspection and Adjustment



WARNING: Always chock the wheels when manually releasing the spring brakes, or the vehicle could roll causing property damage, personal injury or death.



WARNING: Under no circumstances should a spring brake chamber be disassembled. Disassembly will release a powerful spring which could result in property damage, personal injury or death.

A regular schedule for periodic cleaning, lubrication, adjustment and inspection should be established, based on the type of vehicle operation. It is difficult to predetermine an exact maintenance interval (time or mileage), since vehicles will be used in a wide variety of applications and conditions. If you are uncertain of the proper schedule and procedures for your vehicle, contact your service center.

Brake Inspection and Adjustment

Periodic checking of push rod travel or brake adjustment is essential for good braking. Push rod travel should be checked every service interval to determine if adjustment is necessary. Brake chamber push rods on original equipment chambers now incorporate a stroke indicator to aid adjustment checks – an orange paint marker near the base of the push rod. If the push rod is clean and the brakes require adjustment, the orange marker can be seen protruding from the chamber when the brakes are applied.

Slack adjusters should also be checked to ensure proper operation of the adjuster mechanism at the 6 month interval. Push rod travel should be kept at a minimum without brakes dragging.

Inspect brake linings every maintenance interval. When brake lining or blocks are worn to within 1/16 in. (1.6mm) of rivets, brake lining must be replaced.

This inspection or adjustment should only be performed by qualified service personnel and must be in accordance with instructions provided by the axle manufacturers service manual.

Do not back off or disconnect front brakes so that they are less effective, letting the rear brakes do all the stopping of the vehicle.

At least once a year, the entire brake system must be inspected.

Check:

1. Rubber as it may deteriorate whenever it is used. Rubber brake components should be inspected by a competent mechanic and replaced as necessary. Replacement intervals will vary according to the severity and length of service.
2. Condition of drums, brake chambers, and slack adjusters.

Brake Inspection and Adjustment (cont.)

3. For air leaks.
4. Hose or pipes for rust, damage, deterioration.
5. Proper operation of service and parking brake controls.
6. The condition of the ABS wheel speed sensors and wiring.
7. Proper ABS wheel speed sensor-to-exciter teeth gap.

Periodically inspect the air brake chamber diaphragm, air compressor, and air cleaner and replace if considered unserviceable.

Air Dryer

Note: The use of an air dryer does not eliminate the need to periodically drain the air reservoirs.

The air dryer removes humidity (water), air compressor oil and dirt from the incoming compressed air, thus protecting the air system against deterioration and restriction.

The air dryer is installed between the air compressor discharge line and the “Wet Tank”. The air dryer has a desiccant cartridge and a filter which is serviced as an assembly. Moisture from the air collects on the desiccant and is automatically discharged.

Life and performance of the air dryer depends on usage, air humidity levels, environmental temperatures, air compressor oil control and desiccant quantity. Regularly check the desiccant, purge valve and air dryer heater performance.

Desiccant Air Dryer

Open reservoir drain valves and check for presence of water. Small amounts of water due to condensation is normal. If the wet (air) tank and primary or secondary tanks are collecting an abnormally high amount of water between regular air tank drain intervals, replace the air dryer desiccant.

The air dryer desiccant replacement interval may vary; it is generally recommended that the desiccant be replaced every 12 months for small air dryers, or every 24 months for large air dryers. If experience has shown that extended or shortened life has resulted for a particular installation, then the interval should be increased or reduced accordingly.

Brakes (cont.)

Air Brakes (cont.)

Air Dryer Purge Valve

Check that the purge valve opens and expels moisture when the air governor shuts off the air compressor. Air should escape rapidly and then quickly stop. If the purge valve does not open or you can hear a slight audible air leakage past the valve for longer than 30 seconds, the valve may be sticking and should be rebuilt. Purge valves may also stick if the air dryer heater has failed and ice is clogging the valve.

Air Dryer Heater

Check that the air dryer heater activates at temperatures below freezing. With the vehicle in a cold environment and before the engine is started, turn on the ignition and touch the air dryer housing. It should be warmer than other metallic items on the vehicle. If some warmth cannot be felt it may indicate that the heater element or the wiring powering it should be serviced.

Refer to the air dryer manufacturers maintenance manual for additional information.

Air reservoir/Tank Moisture Draining

Moisture taken in with the air through the compressor inlet valves collects in the reservoirs. Drain the air tanks periodically. Open the drain cock located wither on the bottom of the tank or in the end of the tank. For ease of draining, some or all tanks may be equipped with optional pull cords. There must be some air pressure in the system to assure proper drainage. Close the drain cocks after all moisture has been expelled. If you are unsure which tank is the wet tank, drain all tanks daily.

On vehicles equipped with automatic drain valve(s) moisture and contaminants are automatically removed from the reservoir to which it is connected. It operates automatically and requires no manual assistance or control lines from other sources.

Periodically, manually drain the reservoir and make sure the drain passage is not plugged.

ABS Connections and Sensors

Periodically push together the ABS wiring connections to assure they are fully seated. Press the wheel speed sensors into their mounting collars to assure they are fully seated.

Frame and Tow Hooks

Before attempting frame repair or modification, consult with the warranty and service department for HME, Inc.

Front and rear tow hooks should be inspected for damage or a loose mounting. This is of great importance, particularly on vehicles where tow hooks are used frequently.

Fuel System

Frequently inspect condition of fuel tanks and mounting hardware, fuel tank cap and vent, fuel lines, clips and routing. Periodically drain water and sediment from the fuel tank via the drain plug on the bottom fuel tank.

Drive Shaft

At the regular lubrication interval, check universal joints, slip joints, slip joint boot, and carrier bearings for any evidence of wear or looseness. Should drive shaft vibrations occur, stop the vehicle immediately to avoid possible hazardous consequences or damage to other components.

Suspension (Air and Steel Springs)

CAUTION: Do not adjust air suspension height to any setting other than the specified setting. Altering the height setting will change the driveline angle and may result in unwarrantable component damage, such as transmission component damage.

Verify drive axle air suspension height and height control valve performance at engine lube oil change intervals.

Note: Suspension alignment must be maintained at all times.

Periodically:

- * Check condition of spring leaves for evidence of fatigue, bending or breakage.
- * Check condition of suspension mounting brackets and bushings.
- * Check that suspension mounting fasteners (brackets, bushings, etc.) are tight.
- * Check that torque rod mounting fasteners are tight.

Suspension (Air and Steel Springs) (cont.)

* Check U-Bolts as follows:

1. After the chassis has been operating under load for 1,000 miles (1 600 km) of six months, whichever comes first, the U-Bolt nuts must be re-torqued.
2. Thereafter, the U-Bolt nuts must be re-torqued every 36,000 miles (57 936 km).

Note: See U-Bolt Nut Torquing Chart.

Steering

General



WARNING: Always follow recommended procedures for steering system maintenance. Failure to maintain the steering system in proper condition can cause reduced steering ability resulting in property damage, personal injury or death.

Ask your service technician to examine the steering mechanism. Minor adjustments could head off further problems.

Check tie rod ends, drag link ends and king pins. Joints and fastener must be tight. Articulating joints must be well lubricated.

Check for installation and spread of cotter pins and tightness of nuts at both ends of tie rod and drag link.

Check that pitman arm (steering arm at steering gear) mounting is tight and locked. Check system for leaks or hose chafing. Repair at once.

Maintain proper steering gear and power steering pump lubricant levels.

Regularly inspect steering column joint bolts and steering linkage, particularly for body-to-chassis clearance.

NOTE: Have any steering problems corrected at once by a qualified service technician.

Tightening Steer Intermediate Shaft Joint Bolts

As a good maintenance practice, it is recommended that steering gear mounting bolts, and miter box mounting hardware and intermediate shaft joint bolts be checked for tightness every 30,000 miles (48 000 km) or annually, whichever occurs first. Tighten bolts to torque specified in the Torque Specification chart. **DO NOT OVER-TIGHTEN.**

Chart

U-BOLT NUT TORQUE CHART

U-Bolt Diameter (Nominal)	Torque	
	lbf –ft	N.m
¾ Inch Flanged Lock Nut	150-180	203-244
7/8 Inch Hex Head with Washer	240-290	325-393
1 Inch Hex Head with Washer	350-430	475-583

Capscrew / Bolt Torque Chart

Capscrew- Bolts (UNF – Grade 8) Size in inches	3/8	1/2	5/8	3/4	7/8	1	1 1/8
Min. Torque (lbf-ft)	25	50	150	300	500	700	900
Max. Torque (lbf-ft)	35	75	200	350	550	800	1000
Note: Torque values DO NOT apply to U-BOLTS							

SPRING U-BOLT CHECKS

Check U-Bolt Nuts and re-torque every 36,000 miles (57 936 km) after initial 1,000 mile re-torque.