

MODEL KM T2 C1M2 ASPHALT RECYCLER™ ORIGINAL INSTRUCTIONS



THE CHOICE OF ASPHALT PROFESSIONALS WORLDWIDE

KM INTERNATIONAL

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INTRODUCTION

The **KM International Team** would like to take this opportunity to **THANK YOU** for your purchase of the **KM T-2 ASPHALT RECYCLER**. We at KMI are confident that the newest addition to the KM International product offering will provide you with years of safe, reliable and cost effective use. We are sure that the **KM T-2** will begin paying for itself in the form of savings with the first batch of recycled asphalt that it produces. In January 2009 the Michigan Department of Transportation (MDOT) engaged KM International, Inc. (KMI) to come up with a feasible plan to recycle the mountains of millings and asphalt product that was building up in equipment yards all over the State of Michigan. KMI was up to the challenge. The challenge though was not to just recycle and be “Green” just for the sake of being “Green” but to do it responsibly. The goal for KMI has always included a product offering that provides **cost savings, purchase justification and profitability for our customers.**




KM International, Inc. has acquired and developed a number of strengths that has fostered KMI's worldwide reputation in the asphalt industry as the “Gold” and “Green” standards. We are the preeminent authority on the “infrared process” of in place asphalt recycle and repair. We have fostered an ongoing industry standard of quality and excellence that continually exceeds our customers' expectations in all of our product offerings including our “Infrared” line of equipment, crack maintenance and “Hot Box” Reclaimers.


Our commitment to the design and manufacture of the highest quality asphalt maintenance equipment in the market is not just a “quote on the wall” but rather the driving force for the entire KMI team.





SAFETY AND WARNING INFORMATION


 **NOTICE:** This unit is not ATEX Certified. Do Not use in any explosive environment.


 **NOTICE:** Operation of the T-2 Asphalt Recycler **requires qualified trained personnel** to be present at all times during operation.


 **WARNING:** **READ and UNDERSTAND** all instructions carefully before starting the **KM T-2 ASPHALT RECYCLER. FAILURE TO FOLLOW** these instructions may result in a possible **fire hazard** and will void the warranty.


 **WARNING:** Always wear protective clothing, including eye and ear protection, leather protective gloves, long sleeved protective shirt, long pants, and leather protective boots when operating this or any other equipment.



 **WARNING:** Any safety screen or guard removed for servicing must be replaced before operating the **KM T-2 ASPHALT RECYCLER. DO NOT USE** the **KM T-2 ASPHALT RECYCLER** if any part has been damaged or placed under water. Immediately **CALL** a qualified service technician to inspect the appliance and to replace any part of the control system which has been damaged.

 **NOTICE:** Maintenance or repair should be performed by a qualified service person.

 **NOTICE:** The **KM T-2 ASPHALT RECYCLER** system should be **INSPECTED** before initial use and annually by a professional **KMI** service person. It is **IMPERATIVE** that the unit's control compartment, burners, and circulating air passageways **ARE KEPT CLEAN** to provide for adequate combustion and ventilation air.



 **WARNING:** Always keep the **KM T-2 ASPHALT RECYCLER** clear and free from combustible materials, gasoline, and other flammable vapors and liquids.

 **NOTICE:** Never obstruct the flow of combustion and ventilation air. Keep the front of the **KM T-2 ASPHALT RECYCLER CLEAR** of all obstacles and materials for servicing and proper operation.


  **NOTICE:** Children and adults should be alerted to the hazards of high surface temperature and should **STAY AWAY** to avoid burns or clothing ignition.





 **IT IS HIGHLY RECOMMENDED THAT YOU HAVE A FIRE EXTINGUISHER ON YOUR JOB SITE AT ALL TIMES.**


  **NOTICE:** The **KM T-2 ASPHALT RECYCLER** is designed to heat asphalt to a working temperature that should not exceed 350 degrees Fahrenheit. The heated asphalt and the unit will become DANGEROUSLY hot quickly; care and caution must be observed at all times. Be aware of your surroundings. Use caution around buildings, utility wires, combustibles, landscaping, etc. to prevent damage.



 **WARNING:** Inspect all fuel lines and connections daily before using the KM T-2 Asphalt Recycler. DO NOT use if damaged in any way.

 **NOTICE:** The T-2 Asphalt Recycler is intended to heat up to 2500 lbs. of asphalt millings or chunked asphalt (12" size and smaller) per drum load. **It is not intended for any other use.**

 **NOTICE:** This unit is trailer mounted and allows for transportation from jobsite to jobsite but is intended for stationary operation on level ground only. Operation during travel or transporting Hot Mix Asphalt in the drum may cause component failure and **will void all warranties.**

 **NOTICE:** *READ and UNDERSTAND* all instructions carefully before starting the **KM T-2 ASPHALT RECYCLER**. The **KM T-2 ASPHALT RECYCLER** requires the presence of an operator at all times. The machine should never be left unattended.

 **WARNING:** **FAILURE TO FOLLOW** these instructions may result in a possible **FIRE HAZARD, BURN HAZARD AND POSSIBLE DEATH** and will void the warranty.



Reporting Safety Defects

If you believe that your vehicle has a defect that could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying KM International Inc.

If the NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, the NHTSA cannot become involved in individual problems between you, your dealer, or KM International, Inc.

To contact the NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY:1-800-424-9153), go to <http://www.safercar.gov>; or write to: NHTSA, 1200 New Jersey Ave SE, Washington, DC 20590. You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

THE KM T2 IS A TRAILER UNIT



NOTICE: It is necessary to learn and know all applicable Department of Transportation regulations prior to towing this vehicle.

AXLE RATING:	7,000 LBS. (EACH)
GVWR:	14,000 LBS.
TIRES:	3,520 LBS. capacity each (load range E)
TIRE PRESSURE:	80 PSI cold inflation
BRAKES:	12V Electric; all four tires; safety breakaway feature
	Optional: Hydraulic brakes; all four tires



WARNING: Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury. Ensure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating identified on the VIN tag of your trailer.




WARNING: Be sure that the tow hitch load rating meets or exceeds the GVWR of the trailer. Inspect the tow hitch for wear. Replace if worn, cracked, or corrosion exists. Inspect and ensure that all connecting hardware is tightened and serviceable.





NOTICE: When connecting the tow vehicle to the trailer ensure to match the tow hitch and trailer hitch size. Inspect that the hitch is securely coupled and safety chains are properly attached before travel.





 **WARNING:** Inspect and test the safety chains and safety breakaway system before travel. The safety breakaway cable must connect to the vehicle, never connect to the hitch.

LIGHTS & BRAKES


 **NOTICE:** Inspect all trailer lighting prior to travel. Inspect rear running tail lights, marker lights, turn signals and brake lights. Ensure that trailer light plug is properly connected to the tow vehicle.


 **WARNING:** For electric brakes it is necessary for the tow vehicle to signal the trailer electric brakes. Inspect the trailer brakes for operation before travel. Failed trailer brakes can result in a hazardous accident causing injury, or death.


 **WARNING:** For hydraulic actuated brake systems it is necessary to inspect the hitch actuator, hydraulic tube lines and connections. Inspect for leaks. Inspect the hydraulic fluid level in the brake actuator. . Inspect the trailer brakes for operation before travel. Failed trailer brakes can result in a hazardous accident causing injury, or death.

 **NOTICE:** A qualified mechanic should inspect the brakes and braking system for proper service and wear.

WHEELS & TIRES

 **WARNING:** Improper tire pressure can result in loss of control which can lead to death or serious injury. Ensure tires are inflated to the pressure indicated on the side wall of the tire before towing the trailer.

 **WARNING:** Be sure lug nuts are tight before each trip. Lug nuts can loosen after initial installation. Check lug nuts for tightness after new tire installation at intervals of the first 10, 25 and 50 miles of travel.


 **NOTICE:** Tighten the lug nuts to 100 ft/lbs. torque. Over tightening will result in breaking the lugs or cause permanent damage resulting in possible wheel failure. Use a calibrated torque wrench to tighten the lug nuts.

The Trailer Handbook, A Guide to Understanding Trailers & Towing Safely, can be purchased through the National Association of Trailer Manufacturers, available at www.natm.com.




KM T2 ASPHALT RECYCLER

The KM T2 Asphalt Recycler is designed to recycle milled or chunked hot mix asphalt to working temperature. The KM T2 Asphalt Recycler will safely recycle up to four tons of material per hour using either pure asphalt cement, CRF, and/or shingles to bring life back to the material. The solid welded construction and straight forward design is simple to use and requires little maintenance.

 **NOTICE:** Safety is always a concern when working with any fuel combustion system and the KM T2 Asphalt Recycler diesel fuel burner system is no exception. **WARNING:** **DIESEL FUEL LEAKS PRESENT A DANGER** and must be corrected prior to operating the burner. Fuel spills should be properly cleaned up prior to system operation.


The burner is designed to burn **No.1 or No.2 Heating Oil (ASTM D396) ONLY.**

 **DANGER:** **NEVER USE GASOLINE** in the burner as an explosion could result. **NEVER** use crankcase or waste oil in this burner; contamination could cause burner malfunction.

HOW DOES THE KM T2 ASPHALT RECYCLER WORK

The KM T2 Asphalt Recycler uses a 700,000 BTU, 12 VDC powered fuel oil combustion burner to produce heat inside of the drum. The material tumbles throughout the drum area while being heated from the burner.


Once the material being recycled has nearly reached the optimum temperature, asphalt cement, CRF, and/or shingles should be added to revitalize the asphalt. Once the additive has been thoroughly mixed the load can be discharged and transferred to a KM Hotbox Reclaimer to maintain the load temperature during transport to the job site(s).

 **WARNING:** Never clean the drum with a combustible solvent. Doing so will result in fire or explosion.

Daily cleaning with a shovel or the tumbling of stone is the best maintenance for the interior of the KM T2 Asphalt Recycler.



PRE-OPERATION INSPECTION CHECK LIST

 **NOTICE:** Before operation of this unit, there should be an inspection of key components to ensure that the machine is operating safely and efficiently. **Always turn off the engine, remove the engine key and remove the 12v DC burner power key prior to performing any repairs or maintenance to the T-2 unit.**

1. **VISUAL INSPECTION.** The T-2 Asphalt Recycler should always be visually inspected for damage, signs of abuse, missing components, loose or missing bolts and fittings and fuel or oil leaks prior to operation.
2. **OPERATE ON LEVEL GROUND.** The T-2 Asphalt Recycler must always be level during operation. Unleveled operation may cause premature component failures.
3. **INSPECT INTERIOR COMPARTMENT.** Open both access panels on either side of the T-2 to ensure that the compartment area has not been used for storage purposes. Remove all items from compartment prior to operation. Both doors must be closed during operation.
4. **INSPECT DRIVE CHAIN.** Visually inspect the drive chain for excessive wear or obstructions. The chain tension is maintained by an automatic, spring loaded chain tensioner.
5. **EXHAUST FAN.** KM T-2 recyclers are fitted with a 12v DC exhaust fan to aid the flow of heat thru the drum. Fan will power on when engine key is turned to the "RUN" position. When possible, position the Recycler so the burner is up-wind and the fan is down-wind.
6. **FUEL CAPACITY.** The diesel tank capacity is 80 gallons and allows you to operate all day without refueling. Top off each day before use with No.1 or No.2 Heating Oil (ASTM D396) ONLY.



7. **BATTERY VOLTAGE.** Check the battery for the proper voltage. The burner ignition key will need to be inserted and turned to the on position. The volt meter should read at least 12 volts. Low voltage may cause premature component failure.
8. **SHUT OFF VALVES.** Diesel fuel shut-off valve must be in the full open position prior to starting the unit.
9. **HYDRAULIC FLUID.** Check Hydraulic Fluid Level in 28 gallon Hydraulic Tank. Level should be approximately mid-range on the sight glass. If necessary, fill with hydraulic fluid, TYPE AW 32, to proper level.
10. **HYDRAULIC CONTROLS.** Hydraulic Control Valves, located on the rear passenger side fender, must all be in the neutral (Center) position before operation.
11. **ENGINE PRE-OPERATION.** Consult the engine manufacturer manual for engine specifications including proper starting, operating and maintenance.



T-2 OPERATION

The KM T2 Asphalt Recycler is equipped with a chute to allow easy loading of material into the drum. Loading can be accomplished using a loader and the chute vibrators to help expedite load through the chute.





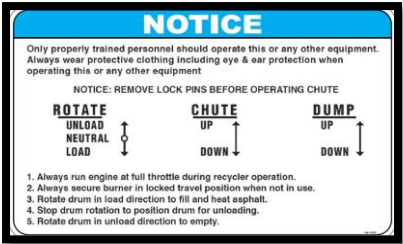
WARNING: STAY CLEAR FROM CHUTE AREA WHILE LOADING IS BEING PERFORM, FALLING DEBRIS MAY RESULT IN PROPERTY DAMAGE, INJURY, OR DEATH.



1. HYDRAULIC CONTROL VALVES. The Hydraulic Control Valves, located on the rear passenger side fender, must all be in the neutral position prior to starting the engine.



2. START ENGINE. Consult the engine manufacturer's manual prior to operating the engine. Turn the key to the preheat position. Once the glow plug indicator has gone out, start the engine. Allow engine and hydraulic fluid to warm-up prior to moving the throttle switch to the run position. In cold weather allow engine to run at idle speed until hydraulic fluid is at 60 degrees F or warmer. During operation the engine must be operated at full speed. This is necessary to supply sufficient hydraulic fluid pressure and the necessary electrical current to maintain battery charge and to properly operate the T-2 Asphalt Recycler. Failure to operate the engine at full throttle will cause the drum to slow and the battery to operate at less than optimum. Without sufficient electrical current the burner may be damaged as well as electric circuitry.

	<p>3. CONFIRM FAN OPERATION. The exhaust stack on the Drum is supplied with an AUTOMATIC EXHUAUST FAN. The FAN should come on automatically during normal operation. This helps to prevent excessive hot air and vapor escaping from the drum opening at the burner.</p> <p>⚠ WARNING: OPERATING THE DRUM WITH NO FAN OPERATION MAY CAUSE HOT GASES TO BE FORCED OUT OF THE DRUM AROUND THE BURNER. THIS IS NOT RECOMMENDED.</p>
	<p>4. CHUTE PINS. When the loading chute is in the up and pinned position the safety Locking Pins must be removed prior to moving the loading chute into the down or loading position.</p> <p>There are two safety Locking Pins, one on the left side and one on the right side. The safety Locking Pins are supplied with steel lanyard cables and spring-style cotter pins to hold the pins in position. When not in use, holders are provided.</p> <p>⚠ NOTICE: Always keep the safety Locking Pins in place when the loading chute is in the up position.</p> <p>⚠ WARNING: ALWAYS VERIFY THAT THE AREA IS FREE OF PERSONNEL AND OBSTRUCTIONS BEFORE LOADING OR UNLOADING ANY MATERIAL INTO THE T-2 ASPHALT RECYCLER.</p>
	<p>5. CHUTE DOWN. Identify the hydraulic lever that operates the loading chute. Adjust the lever to move the loading chute into the down – LOADING position. Once in position, place the Drum rotation control lever into the “LOAD” position to start proper drum rotation.</p>



6. LOAD MATERIAL. Load asphalt material into the rotating drum through the loading chute until the drum is full. NOTE: the drum is full when it will not accept any additional material without excess spillage from the drum opening.



7. CHUTE UP. Move the loading chute to the “UP” position and replace safety Locking Pins.



NOTICE: Always keep the safety Locking Pins in place when the loading chute is in the up position.



WARNING: Be aware of any falling debris. Some loose asphalt material may remain in the loading chute after the loading operation. This material may drop from the loading chute as it is raised



8. MOVE BURNER. Remove the burner from its travel position. This will require the removal of the safety pin; the spring loaded locking pin and the “T” handle, threaded position lock and the pinned travel cover. The pinned travel cover is located on the front of the burner.

	<p>9. POSITION BURNER. Move the Beckett Burner into position inside the drum opening. Place the Burner locking pin in place (Located at the base of the arm by the fender,) and tighten the “T” handle position lock.</p> <p>NOTICE: The Burner will not operate if it is not positioned in the drum opening.</p>
	<p>10. POWER BURNER. Turn the red 12 volt power key to the on position (Figure 3). Verify a minimum of 12 Volts is supplied at the burner.</p>
	<p>11. START BURNER. Turn the toggle switch ON. The Burner has a 5 second pre-purge delay before fuel introduction and ignition. The pressure gage should be steady at 120 psi. The burner nozzle may drip some fuel into the drum while it is warming up.</p> <p>NOTICE: Diesel fuel is difficult to ignite in cold, damp weather. It may be necessary to ignite the diesel burner with a hand held torch the first time in adverse weather conditions.</p>
	<p>12. ADD MODIFIER. Add the desired amount of asphalt cement to the hopper towards just before the load reaches specified temperature. This may be accomplished in a variety of ways including the use of recycled asphalt roofing shingles. The shingles should be torn into pieces and any nails or other debris should be removed prior to being added to the drum and asphalt product. Please be aware that the plastic strip on the back of the shingle will not melt into the mix and should be removed.</p> <p>NOTICE: for safety reasons KMI recommends that the drum rotation be stopped prior to adding any materials by hand, including AC.</p>

	<p>13. HEAT TIME. Heating times will vary due to outside temperatures, the type and quality of recycled asphalt material (RAP), which can vary dramatically from area to area, and RAP moisture content. The KMI supplied Infrared Thermometer should be used during heating to check asphalt temperature. Optimum temperature of the entire mix should be 335 degrees Fahrenheit. Optimum temperature should be reached prior to dumping. If temperatures vary the lowest temperature should be used.</p> <p>NOTICE: Do not heat an empty drum. Overheating will damage the drum. The drum should always be rotating and have some material in it while heat is being applied.</p>
	<p>14. SWITCH OFF BURNER. Turn Toggle switch to the OFF position and allow the Burner to complete its' fifteen (15) second (previously 30) post purge cycle. Turn Red 12 Volt Power Key to the OFF position. Remove the Burner Arm Lock Pin and return the Burner to its travel position: lock the arm in place to avoid physical damage while dumping the load.</p> <p>WARNING: The Burner is HOT at the Burner nozzle end.</p> <p>Caution must be taken to avoid injury while moving the Burner Arm.</p> <p>NOTICE: Be sure to secure all three burner locks (manual pin, threaded tee handle and spring pin). Replace the Burner travel cover after the burner has cooled.</p>
	<p>15. REVERSE DRUM TO UNLOAD. Move the drum rotation hydraulic selector lever to the NEUTRAL position to stop the drum rotation. REVERSE DRUM. Move the drum rotation lever to the unload position to reverse drum rotation and begin emptying the drum.</p>



16. RAISE DRUM. Use the hydraulic dump lever to raise the drum approximately twenty (20) degrees. Continue rotation until the drum has been emptied. The flights inside the drum will assist in the dumping of the asphalt material. The flights will push the RAP to the drum opening. It is not necessary to raise the drum to its full up position to empty the drum. The drum should be raised to a position that causes the RAP to dump cleanly and easily.



NOTICE: DO NOT ALLOW THE RECYCLED ASPHALT TO COOL AND HARDEN IN THE DRUM.



17. LOWER DRUM. The drum rotation should be stopped and then returned to the full down position after completely emptying the load.

WARNING: Clear all personnel when returning the drum to its full down position. Make certain that the drum platform is clear of any objects and debris also. DANGER PINCH POINTS MAY CAUSE SERIOUS INJURY OR DEATH.



CLEANING, STORAGE and TRAVEL

1. CLEAN THE DRUM. Excess Asphalt Material will build up in the Drum. It is recommended that the Drum be cleaned as needed. To clean the Drum, add a small amount of crushed limestone - approximately 1/4 cubic yard.


Follow **FILLING THE DRUM 1-7 in the above T-2 Instructions** to fill the drum.

The rotation should be started and heat added.


Follow **HEATING THE ASPHALT 1-4 in the above T-2 Instructions** to operate the burner.

The heat will soften the RAP and the asphalt material will adhere to the limestone as it rotates. Dump the hot crushed Limestone/Asphalt Material mix into your RAP pile for future recycling use.


  **WARNING:** THIS MATERIAL WILL BE EXTREMELY HOT.

 **NOTICE:** Never apply heat to the drum when it is empty. It will cause premature equipment failure and will void the warranty.

2. STORAGE. The T-2 Asphalt Recycler should be stored in a secure and protected area. While it is noted that this equipment is for outdoor use it is recommended that long term storage occur in a garage or other covered area. In the event that covered storage is not available it is recommended that the unit be covered with a tarp or other protective covering. This will ensure that damage from the elements to component parts is kept to a minimum.


 **NOTICE:** The T-2 Asphalt Recycler is a trailer mounted unit and allows for transportation from jobsite to jobsite but is intended for stationary operation.


3. TRAVEL. Prior to any transportation the pinned burner travel cover MUST be properly secured to the burner to avoid any damage that may result from debris or elements entering the Burner chamber.

 **NOTICE:** The T-2 Asphalt Recycler should be inspected both before and immediately after any travel. Prior to travel, the operator should insure that all locks and fasteners are properly secured. Following any transport the T-2 should be immediately inspected for loose or damaged component parts that may be a result of road travel.





MAINTENANCE

 **WARNING:** The KM T2 ASPHALT RECYCLER manual should be read in its entirety before operation of this machine. Failure to do so may result in **SERIOUS BODILY INJURY OR DEATH.**

 **WARNING:** The KM T2 ASPHALT RECYCLER must be operated by trained qualified personnel only. Qualified personnel **MUST** understand the operation and potential dangers of operating this or any other heavy machinery.

 **WARNING:** The KM T2 ASPHALT RECYCLER uses an open flame heating system and will cause **SERIOUS BODILY INJURY OR DEATH** if not used in strict conformity with the operating instructions and procedures outlined in this manual.

  **WARNING:** Proper safety clothing and protective gear are required including but not limited to; Safety Heat Resistant Gloves, Safety Glasses, Ear Protection, Leather Heat Resistant Steel Toed Boots, Long Sleeved Shirt, Pants. Failure to wear protective clothing and gear may result in **SERIOUS BODILY INJURY OR DEATH**

KM International recommends that each owner/operator of the T-2 adopt a regular maintenance schedule on all KM International equipment including the T-2 Asphalt Recycler. This should include regular inspections of all component parts and body construction for normal wear and corrosion. KM International is available as needed to provide maintenance support and, if necessary on site repair. We always encourage our customers to call or e-mail for any assistance that may be necessary to keep our equipment including the T-2 in optimum condition.

1. KM International, Inc. requires the user and owner of the T-2 Asphalt Recycler to follow the Grease/Lubrication schedule as noted. The Load Chute and Pivot Points should be greased daily when in use. The CASTERS should be greased through the fittings. IT IS NOT NECESSARY TO GREASE THE CASTER FITTINGS ON BOTH SIDES. The single thrust caster (located at the rear, center frame under the drum) is sealed for life. The Chimney fittings: only apply if present. The HOIST and BURNER ARM fittings should be greased weekly. All others, monthly.

2. KM International, Inc. requires the user and owner of the T-2 Asphalt Recycler to follow the **Beckett Burner Manufacturers** recommended maintenance procedures as outlined in the Beckett Burner Manual provided with the T-2. If you should have any questions please contact the burner manufacturer directly at www.beckettcorp.com.

3. KM International, Inc. requires the user and owner of the T-2 Asphalt Recycler to follow the **Kubota Engine Manufacturers** recommended maintenance procedures as outlined in Kubota engine manual provided with the T-2. If you should have any questions please contact the engine manufacturer directly www.kubotaengine.com



T-2 Maintenance Schedule & Log

GENERAL									
DAILY	Clean drum interior of asphalt build up.								
	Inspect drum exhaust for buildup. * Inspect & clean chimney exhaust build up as needed.								
	Grease all casters, Note: rear, lower single thrust caster is sealed for life.								
	Check fuel level. Keep from running engine and burner empty. *Note: Both require re-priming if run until empty.								
	Inspect trailer * Tire lugs & inflation (Tire inflation 80 psi cold. Lug torque = 110 ft -lbs). * Hitch * Trailer lights * Trailer brakes * Emergency breakaway								
	Inspect burner connections & hardware. Visually inspect electrodes before installing burner into combustion zone.								
	Walk around and visually inspect the entire unit.								
	Check hydraulic fluid level before operating. Monitor temperature periodically during operation. (100 to 130°F)								
	Check engine oil level.								
	WEEKLY	Grease burner pivot arm.							
Grease dump frame hinges and pivot points.									
	Inspect Tires & Lugs * Confirm Torque specification 110 ft - lbs.								
HYDRAULICS									
300 HOURS OR SEASONAL	Replace Filters * Return Line Spin-on Filter * Tank In-Line Suction Strainer Filter * Filler Breather Hydraulic Tank Cap								
600 HOURS OR SEASONAL	Replace Hydraulic Fluid. (40 gal. capacity) * AW 32 Recommended for cold weather application. * AW 46 Recommended for warm weather application.								
NOTE OTHER SERVICE PERFORMED									
6 MONTHS	Grease trailer wheel bearings.								





T-2 Maintenance Schedule


ENGINE				
50 HOURS	Check fuel lines and clamps.			
	Inspect engine for lose hardware and/or abnormal wear.			
100 HOURS	Change Engine Oil 15W40 Diesel Oil recommended. Consult Kubota Manual or Service Center.			
	Change Oil Filter Kubota D902 NSM Series / NAPA 1064 recommended. Consult Kubota Manual or Service Center.			
	Clean air filter element			
	Clean Fuel Filter. Consult Kubota Manual or Service Center.			
	Check fan belt tightness. Consult Kubota Manual or Service Center.			
	Drain water separator.			
200 HOURS	Inspect radiator hoses & clamps.			
400 HOURS	Replace fuel filter element. Consult Kubota Manual or Service Center.			
500 HOURS	Clean water jacket (radiator interior).			
	Replace fan belt.			
600 HOURS	Replace air cleaner element.			
800 HOURS	Check valve clearance. Consult Kubota Manual or Service Center.			
1500 HOURS	Check fuel injection nozzle injection pressure. Consult Kubota Manual or Service Center.			
3000 HOURS	Check injection pump. Consult Kubota Manual or Service Center.			
EVERY 2 YEARS	Replace radiator hoses and clamps. Consult Kubota Manual or Service Center.			
	Replace fuel lines and clamps. Consult Kubota Manual or Service Center.			
	Change radiator coolant. Consult Kubota Manual or Service Center.			
	Replace air intake line. Consult Kubota Manual or Service Center.			
NOTE OTHER SERVICE PERFORMED				



TROUBLE SHOOTING







PROBLEM	INSPECT FOR SOLUTION
Engine will not start	Blown Fuse. Inspect the blade fuse located at the battery.
	Dead Battery. Consult a certified technician to have battery inspected under load. Charge or replace as necessary.
	Out of fuel. Check fuel level.
	 NOTICE: #2 Diesel Fuel Only.
	Clogged fuel filter. Inspect fuel filter located at the fuel tank outlet. Clean or replace as necessary.
Engine starts but stops in 5 seconds	Consult Engine Operators Manual
	Emergency Stop Button at burner is depressed.
	Twist and pull the Emergency Stop Button to enable operation.
	Inspect the normally closed switch contacts within the E-Stop control.
Drum will not turn when hydraulic control lever is engaged.	Consult Engine Operators Manual
	Engine Idle speed not switched to Run. See switch at engine start panel. Turn to Run.
	Hydraulic fluid is cold. Allow unit to Run for a minimum of 5 minutes when operating in cold temperatures. Fluid operating temperature should be 100 to 130* F. Adjust cooler hydraulic fan to a slower speed. If conditions are extremely cold, set fan at 0 rpm: AW 32 hydraulic fluid may be required if hydraulic oil temperatures cannot be increased during normal operation.
	Low Hydraulic fluid. Inspect Hydraulic Fluid Level. If low, STOP. Power engine off. Inspect for leaks. Repair leaks as necessary. Replace any hoses or fittings that may have failed. Add fluid as required.
Chute will not move up or down.	 NOTICE: AW 46 Hydraulic fluid is recommended for normal operation.
	Safety pins are in place. Remove pins from chute locked position.
	Hydraulic fluid is cold. See above.
No voltage at the burner when power is ON (Red Key).	Engine not switched to Run speed.
	Blown fuse. Inspect and replace the 30 A fuse at the battery.
	Loose wire. Inspect the wire terminal connections on the Red Key switch. Inspect the wire terminal connections on the Voltmeter.
	Bad switch. Use a multi-meter to check incoming and outgoing current on the switch terminals. If a meter is unavailable, use a short jumper wire to connect the terminals on Red Key Switch. Replace switch if necessary.
	Bad Voltmeter. Inspect wire connections including ground connection. Use a multi-meter to inspect incoming current. Replace Voltmeter if necessary.



PROBLEM	INSPECT FOR SOLUTION
No burner blower when switched On with the Toggle Switch.	Loose wire. Inspect the wire terminal connections on the Toggle Switch. Use a voltmeter to inspect incoming and outgoing current. If a meter is unavailable, use a short jumper wire to connect the terminals on the Toggle Switch.
	Safety Limit Switch(es) not engaged. Ensure that the burner is properly locked in its' operating position. Inspect the Safety Limit Switches located on the burner arm for engagement.
	Bad wire connection. Inspect the enable wire (white) connection inside of the Beckett Burner GeniSys control.
	Genisys control. Inspect 30A fuse in the burner Genysis control. Replace if necessary. Note: If a replacement fuse immediately fails, then it is necessary to thoroughly inspect for wiring failure.
	Bad burner GeniSys control. Use a multi-meter to confirm incoming current at the enable connection. Replace control if necessary.
Burner will not ignite.	Fuel failure. Look for constant pressure on the gauge located on the burner (120 psi). If the pressure is not holding steady, then purge the fuel line of air. Consult Burner Operating Manual.
	Out of fuel. Check fuel level in tank. Note: The engine should be stalling at this point.
	 NOTICE: #2 Diesel Fuel Only.
	Burner fuel valve failure. Consult Burner Operating Manual.
	Clogged fuel filter. Inspect fuel filter located at the fuel tank outlet. Clean or replace as necessary.
Burner intermittently operating.	Safety Limit Switch(es) not entirely engaged. Ensure the burner is in its locked operating position.
	Low fuel/ Fuel failure. See above.










PARTS LIST






LOCATION	PICTURE	NAME	DESCRIPTION	PART #
Fuel Supply		FUEL TANK, 80 GAL	FUEL TANK, 80 GAL, 30" X 30" X 20" H, 12 GAUGE ALUMINIZED STEEL, 2" FILL & CAP, 3/4" DRAIN, 3/4" OUTLET 3/4" RETURN AT TOP, POWDER , SEMI-GLOSS BLACK	KMI0533-0 / 100001326 Rev C
Fuel Supply		Diesel Fuel Gauge	Therma Type H Gauge, 1.5" Opening, 20" Depth	H-1.5-20
Fuel Supply		3/8" Ball Valve	3/8" Full Port Ball Valve	T-1001-102
Fuel Supply		Diesel Fuel Filter Assembly	Diesel Fuel Filter Assembly, 3/8" npt, 40 PSI Max, 10 GPH	1A-25B
Fuel Supply		Diesel Fuel Filter Element	Diesel Fuel Filter Element	1A-30
Fuel Supply		3/8" CHECK VALVE	3/8" APOLLO CHECK VALVE	11898-01650
Fuel Supply		3/8" Fuel Hose	3/8" Fuel Hose, 50 PSI Max	11898-01753



Fuel Supply		3/16" FUEL LINE	3/16" FUEL LINE - (T2) ENGINE RETURN LINE	11898-01525
Diesel Burner		SDC Diesel Burner	B7503 MODEL SDC GENERIC W/ ADJUSTABLE UNIVERSAL FLANGE	B7503
Diesel Burner		PUMP, 1/S 7PGH	OIL PUMP 1/S 7GPH, A2YA7916 SNTC UP, BECKETT MODEL SDC	2591U
Diesel Burner		Valve, Diesel Burner	Diesel Burner Solenoid Valve	21441U
Diesel Burner		BURNER NOZZLE 4.5X80B	BURNER NOZZLE FOR SDC BURNER 4.50 X 80B	2622
Diesel Burner		Electrode Kit, Diesel Burner	Diesel Burner Electrode Kit	578731
Diesel Burner		Igniter, Diesel Burner	Igniter with Control Board, Diesel Burner	5218301U

Diesel Burner		Controller, Diesel Burner	Primary 12 Volt Genisys Controller, Diesel Burner	7556P15/30U
Diesel Burner		Hour Meter	Hour Meter, Quartz, 8-32 V	1877T85
Diesel Burner		Toggle Switch, 2 Way	2 Way Toggle Switch, SPST On-Off, Sealed Metal, 15A, Blade Terminals	44251
Diesel Burner		Voltmeter	Voltmeter, 8-18V, Black	CP8215
Diesel Burner		Master Disconnect	On-Off Master Disconnect with Red Key	44075
Diesel Burner		Main Red Key	Replacement Red Key for Main Disconnect	44077
Diesel Burner		LIMIT SWITCH	LIMIT SWITCH LEVER ARM TYPE	SQD9007C54B2

Diesel Burner		LEVER ARM	LEVER ARM (FOR LIMIT SWITCH)	SQD9007CA11
Diesel Burner		E-STOP SWITCH	E STOP SWITCH, PUSH-PULL 2 POSITION RED BUTTON, 30 MM	SQD9001KR9R
Power Supply		Inline Fuse Holder	Inline Fuse Holder 10G, Weather Resistant, 4" Leads	MATC30
Diesel Engine		KUBOTA DIESEL 898 CC 60 AMP	KUBOTA DIESEL ENGINE 898 CC, 60 AMP, 3 CYLINDER INLINE, COMPLETE ASSEMBLY.	D902-12739
Diesel Engine		RAIN CAP	EXHAUST RAIN CAP 1-3/8" ID	RC 66
Diesel Engine		FUEL FILTER (INLINE)	FUEL FILTER (INLINE)	23002

Diesel Engine		AIR CLEANER ELEMENT	AIR CLEANER ELEMENT - KUBOTA 898CC (D902)	1G659-11222
Diesel Engine		OIL FILTER	OIL FILTER - KUBOTA 898 CC (D902) NSM SERIES	70 000-15241
Hydraulics		T-2 HYD MOTOR	WHITE HYDRAULIC MOTOR, DT SERIES, 32.7 IN DISPLACEMENT, 7/8-14 UNF OFFSET PORTS, 1-1/2" STRAIGHT SHAFT	700540C8130AAAAB
Hydraulics		T2 HYDRAULIC FILTER	HYDRAULIC FILTER REPLACEMENT FOR T2, SPIN ON	AE-10L
Hydraulics		HYD RESERVOIR KIT, T2	HYDRAULIC RESERVOIR KIT, T2, INCLUDES RESERVOIR, FILLER BREATHER, SIGHT GAUGE, RESERVOIR COVER, DRAIN PLUG, INLET STRAINER	JWF-SUB-0028-13-A







Hydraulics		SIGHT GAUGE 5", T2	SIGHT GAUGE 5", T2 HYDRAULIC RESERVOIR	FMALG-5T
Hydraulics		0-5000 PSI GAUGE	0-5000 PSI GAUGE, 2.5" LIQ FILLED, 1/4" BOTTOM MOUNT	CF-1P-350
Hydraulics		2" BORE CYLINDER-3000 LB	2" BORE DOUBLE ACTING TIE ROD CYLINDER-3000 PSI, 16" STROKE, 1 1/8" ROD DIAMETER, 9420 # LOAD, SAE 8 PORTS	320-837
Hydraulics		Hydraulic Hoist, CS 515	4.4 - 12 Ton Hydraulic Scissor Hoist	CS 515T FF
Trailer		DC-200 12V VIBRATOR	DC-200 12V ELECTRIC VIBRATOR(INCLUDES 20' POWER CORD)	200442-KMI
Trailer		PUSH BUTTON (VIBRATOR)	PUSH BUTTON 30 MM SWITCH FOR T2 VIBRATOR	SQD9001KR1U



Trailer		8" x 3" FORGED STEEL CASTER	8" x 3" FORGED STEEL CASTER WITH 1 1/4" TAPERED ROLLER BEARING	7058179
Trailer		552 CFM 12 VDC BLOWER	12 VDC BLOWER, DAYTON 552 CFM	3HMJ1
Trailer		PADDLE HANDLE LOCKING	PADDLE HANDLE W/LOCK, KEYED W/545 FLUSH MOUNT STAINLESS SINGLE LATCHING POINT	PAD-L3885-SS-545
Trailer		Break Away Kit	Break Away Kit with 44" Leads	BA10-150
Trailer		7k Side Wind Jack	7k Bulldog Pipe Jack, Side Wind, Pipe Mount, 15" Lift	198250
Trailer		2" Red Marker Light, LED	2" LED Round Red Marker Light	ECVML202R
Trailer		Red Slim Marker, LED	120 Series LED Red Slim Marker Light	ECVML122R



Trailer		Yellow Slim Marker, LED	120 Series LED Yellow Slim Marker Light	ECVML122Y
Trailer		ID Marker Light Bar, LED	LED ID Marker Light Bar, 3 Red LED With Black Mounting Bracket	ECVIDML12R-RD
Trailer		License Light and Bracket	License Tag Light With Bracket	LP-52CB
Trailer		6" Oval Red Tail Light, LED	6" Oval Red LED Stop, Tail, Turn Light	ECV062STT RED
Trailer		7K Axle With Spring	7000 LBS 865 86.5"x70" ST EL With 5 Leaf Spring Mounted Under	70865ESTEZ 86.5 x70



TRAINING POLICY

The optimal and efficient operation of your KM Equipment requires instruction on the operation and maintenance of the equipment. We at KMI are very much aware that time is a precious commodity and will take all the steps necessary to ensure that equipment training is done in a professional and expedient manner. We are in the process of developing a library of instructional videos that will be available shortly. We encourage our customers to take advantage of our extremely knowledgeable staff as needed for trouble shooting or to answer equipment operation questions. We are available during normal business hours, 8:30 a.m. to 4:30 p.m. EST, Monday through Friday by phone – (810) 688-1234 or by e-mail at kmi@kminternational.com. We encourage you to contact our sales staff to schedule a convenient training session for your staff prior to operation.

If you are using the KMI infrared equipment for applying thermo-plastic, similar product or any use other than asphalt reheating and repairing, our technicians are unable to answer specific questions on those application processes. We would encourage the user to contact the applications manufacturer.

Additionally, we encourage our customers to take advantage of our hands on training classes made available to all purchasers and their staff as requested and/or necessary. We have incorporated a small fee associated with on sight training in an effort to encourage education without making the process cost prohibitive or too time consuming for our staff. This small charge will help to keep KMI equipment price competitive and user friendly. KM International will train FREE OF CHARGE any customer or customer employees that travel to the KMI manufacturing facility within the first 90 days of purchase. We would be happy to schedule an appointment for a free ½ day of training on every aspect of equipment maintenance and operation. The customer would be responsible for travel and expenses to the KMI location. Our technical staff is available to schedule an instructional full day of training at the customers site if that is preferred but would require the following:

1. All travel and expense to and from the customer requested location as required, including Hotel and Airfare as necessary. KMI reserves the sole right to determine appropriate and reasonable accommodations and travel.
2. A per-diem food allowance of Fifty U.S. Dollars (\$50.00) per technician, or as agreed.
3. Off-site man charge per technician, to be paid in advance.



LIMITED WARRANTY

KEIZER-MORRIS INTERNATIONAL, INC. (hereinafter called KMII) warrants the equipment manufactured by KMII to be free from defects in material and workmanship on the invoice date to the original purchaser. KMII will, for a period of twelve (12) months from the invoice date, repair or replace any serviceable or consumable parts determined by KMII to be defective. These parts include, but are not limited to, insulation, fuel lines, bearings, filters, ignition components, power supplies, axle components, oil, fuels and lubricants. All components, with the exception of the previously listed twelve (12) month warranted parts, will be covered under this warranty for a period of twenty-four (24) months. The trailer frame components, hotbox body and workmanship is warranted for a period of five (5) years from the invoice date. This warranty applies only when the claim is approved and repaired by a KMII representative.

KMII will not be liable for general wear and tear, or any malfunction, damage or wear caused by misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-KMII component parts. This warranty applies only when the equipment is used for its intended purpose and properly maintained.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized KMII distributor or the factory direct, for verification of the claimed defect. If the claimed defect is verified, KMII will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser standard ground prepaid, expedited shipping will not be covered. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which may include the cost of parts, labor, and transportation. This warranty does not cover labor for component replacement or freight charges for structure and workmanship claims.

KMII will in no event be liable for indirect, incidental, special or consequential damages resulting from KMII supplying equipment hereunder, or the furnishing performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of KMII or otherwise.

KMII's sole obligation and buyer's sole remedy for any breach of warranty shall be set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential lost) shall be available. Any action for breach of warranty must be brought within two (2) Year(s) of date of invoice. THIS WARRANTY IS EXCLUSIVE, NON TRANSFERABLE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED.



At KMI we are the “Asphalt Maintenance and Repair Experts” and pride ourselves in manufacturing only the highest quality equipment available in the asphalt industry, the **KM T-2** is no exception. Our commitment to the design and manufacture of the highest quality equipment in the market is not just a “quote on the wall” but rather the driving force for the entire KMI Team. However, KMI has acquired industry experience that provides the real world knowledge that there are isolated instances when a problem or customer concern may develop. If a problem ever develops with your new **KM T-2 ASPHALT RECYCLER**; KM International will take every reasonable action necessary to get you back on the work site and back to work as quickly and effortlessly as possible.

THE “IN-PLACE RECYCLE AND REPAIR” WORLDWIDE EXPERTS



CERTIFICATE & DECLARATION OF CONFORMITY FOR CE MARKING

Company contact details:

Keizer-Morris International, Inc.

(aka – KM International)

6561 Bernie Kohler Drive, North Branch, Michigan 48461, USA

Phone: 810-688-1234 Fax: 810-688-8765 Website: www.kminb.com

Keizer-Morris International, Inc. declares that there:

Asphalt Recyclers

Models:

KM T2-M1

KM T2-M2

comply with the Essential Requirements of the following EU Directives:

Machinery Directive 2006/42/EC

Electromagnetic Compatibility Directive 2004/108/EC

And further conform with the following EU Harmonized Standards:

EN ISO 12100:2010

EN ISO 13849-1:2008

EN 13020:2004 + A1:2010

EN 61000-6-2:2005

EN 61000-6-4:2007 + A1:2011

Dated: 18 November 2013

Position of signatory: Vice President of Production

Name of signatory: Bryan Burke

Signed below:

On behalf of Keizer-Morris International, Inc.

Bryan Burke



EQUIPMENT INFORMATION & NOTES

MODEL	
SERIAL NUMBER	
PURCHASER	
DATE OF PURCHASE	
NOTES:	

Thank you again for your purchase. We are happy to have you as a customer and are confident that you will have years of efficient operation by following the above parameters and guidelines. We encourage an open dialogue with our customers and prize any feedback. Our commitment to our customers is second to none and our desire to improve our equipment is an integral part of our ongoing growth strategy.

Sincerely,

The KM International Management Team.

KM International, Inc.
6561 Bernie Kohler Drive
North Branch, Michigan 48461
(810) 688-1234 * www.kminb.com

Please call the Team at KM International anytime for questions, comments or to just talk "Asphalt Maintenance."



THE "INFRARED PROCESS" WORLDWIDE EXPERTS

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TIRE SAFETY INFORMATION

1. TIRE SAFETY INFORMATION

This portion of the User's Manual contains tire safety information as required by 49 CFR 575.6. Section

Section 1.1 contains "Steps for Determining Correct Load Limit - Trailer".

Section 1.2 contains "Steps for Determining Correct Load Limit – Tow Vehicle".

Section 1.3 contains a Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure", and other non-technical terms.

Section 1.4 contains information from the NHTSA brochure entitled "Tire Safety – Everything Rides On It". This brochure, as well as the preceding subsections, describes the following items;

- Tire labeling, including a description and explanation of each marking on the tires, and information about the DOT Tire Identification Number (TIN).
- Recommended tire inflation pressure, including a description and explanation of:
 - A. Cold inflation pressure.
 - B. Vehicle Placard and location on the vehicle.
 - C. Adverse safety consequences of under inflation (including tire failure).
 - D. Measuring and adjusting air pressure for proper inflation.
- Tire Care, including maintenance and safety practices.
- Vehicle load limits, including a description and explanation of the following items:
 - A. Locating and understanding the load limit information, total load capacity, and cargo capacity.
 - B. Calculating total and cargo capacities with varying seating configurations including quantitative examples showing / illustrating how the vehicles cargo and luggage capacity decreases as combined number and size of occupants' increases. This item is also discussed in Section 3.
 - C. Determining compatibility of tire and vehicle load capabilities.
 - D. Adverse safety consequences of overloading on handling and stopping on tires.

1.1. STEPS FOR DETERMINING CORRECT LOAD LIMIT – TRAILER

Determining the load limits of a trailer includes more than understanding the load limits of the tires alone. On all trailers there is a Federal certification/VIN label that is located on the forward half of the left (road) side of the unit. This certification/VIN label will indicate the trailer's Gross Vehicle Weight Rating (GVWR). This is the most weight the fully loaded trailer can weigh. It will also provide the Gross Axle Weight Rating (GAWR). This is the most a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

If your trailer has a GVWR of 10,000 pounds or less, there is a vehicle placard located in the same location as the certification label described above. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity. Cargo can be added to the trailer, up to the maximum weight specified on the placard. The combined weight of the cargo is provided as a single number. In any case, remember: the total weight of a fully loaded trailer cannot exceed the stated GVWR.

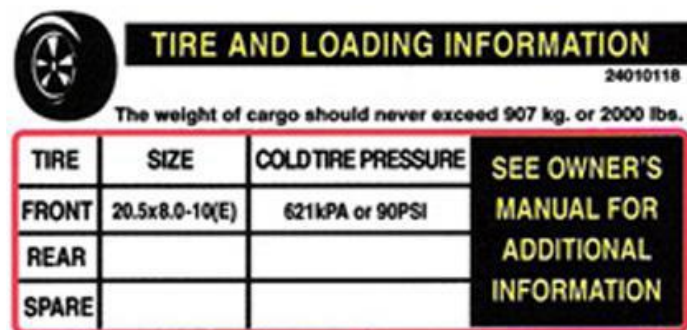


For trailers with living quarters installed, the weight of water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the trailer before it is loaded with cargo, and is not considered part of the disposable cargo load. Water however, is a disposable cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh about 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle. Understanding this flexibility will allow you, the owner, to make choices that fit your travel needs.

When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your dealer to discuss the weighing methods needed to capture the various weights related to the trailer. This would include the weight empty or unloaded, weights per axle, wheel, hitch or king-pin, and total weight.

Excessive loads and/or under inflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. The proper air pressure may be found on the certification/VIN label and/or on the Tire Placard. This value should never exceed the maximum cold inflation pressure stamped on the tire.

1.1.1. TRAILERS 10,000 POUNDS GVWR OR LESS



The placard features a tire icon on the left. The title 'TIRE AND LOADING INFORMATION' is in a black box with yellow text. Below the title is the number '24010118'. A warning line states: 'The weight of cargo should never exceed 907 kg. or 2000 lbs.' The main table has four columns: TIRE, SIZE, COLD TIRE PRESSURE, and a large section for 'SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION'. The first row is for the FRONT tire, with size 20.5x8.0-10(E) and pressure 621kPa or 90PSI. The REAR and SPARE rows are empty.

TIRE	SIZE	COLD TIRE PRESSURE	SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION
FRONT	20.5x8.0-10(E)	621kPa or 90PSI	
REAR			
SPARE			

Tire and Loading Information Placard – Figure 1-1

1. Locate the statement, “The weight of cargo should never exceed XXX kg or XXX lbs.,” on your vehicle’s placard. See figure 1-1.
2. This figure equals the available amount of cargo and luggage load capacity.
3. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity.

The trailer’s placard refers to the Tire Information Placard attached adjacent to or near the trailer’s VIN (Certification) label at the left front of the trailer.



1.1.2. TRAILERS OVER 10,000 POUNDS GVWR (NOTE: THESE TRAILERS ARE NOT REQUIRED TO HAVE A TIRE INFORMATION PLACARD ON THE VEHICLE)

1. Determine the empty weight of your trailer by weighing the trailer using a public scale or other means. This step does not have to be repeated.
2. Locate the GVWR (Gross Vehicle Weight Rating) of the trailer on your trailer's VIN (Certification) label.
3. Subtract the empty weight of your trailer from the GVWR stated on the VIN label. That weight is the maximum available cargo capacity of the trailer and may not be safely exceeded.

1.2. STEPS FOR DETERMINING CORRECT LOAD LIMIT – TOW VEHICLE

1. Locate the statement, "The combined weight of occupants and cargo should never exceed XXX lbs.," on your vehicle's placard.
2. Determine the combined weight of the driver and passengers who will be riding in your vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.
4. The resulting figure equals the available amount of cargo and luggage capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. $(1400 - 750 (5 \times 150) = 650 \text{ lbs.})$.
5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage capacity calculated in Step # 4.
6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult the tow vehicle's manual to determine how this weight transfer reduces the available cargo and luggage capacity of your vehicle.

1.3. GLOSSARY OF TIRE TERMINOLOGY

Accessory weight

The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

Bead

The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

Bead separation

This is the breakdown of the bond between components in the bead.

Bias ply tire

A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

Carcass

The tire structure, except tread and sidewall rubber which, when inflated, bears the load.

Chunking

The breaking away of pieces of the tread or sidewall.

Cold inflation pressure

The pressure in the tire before you drive.

Cord



The strands forming the plies in the tire.

Cord separation

The parting of cords from adjacent rubber compounds.

Cracking

Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT

A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radically inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

Curb weight

The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

Extra load tire

A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Groove

The space between two adjacent tread ribs.

Gross Axle Weight Rating

The maximum weight that any axle can support, as published on the Certification / VIN label on the front left side of the trailer. Actual weight determined by weighing each axle on a public scale, with the trailer attached to the towing vehicle.

Gross Vehicle Weight Rating

The maximum weight of the fully loaded trailer, as published on the Certification / VIN label. Actual weight determined by weighing trailer on a public scale, without being attached to the towing vehicle.

Hitch Weight

The downward force exerted on the hitch ball by the trailer coupler.

Innerliner

The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

Innerliner separation

The parting of the innerliner from cord material in the carcass.

Intended outboard sidewall

The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

Light truck (LT) tire

A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Load rating

The maximum load that a tire is rated to carry for a given inflation pressure.

**Maximum load rating**

The load rating for a tire at the maximum permissible inflation pressure for that tire.

Maximum permissible inflation pressure

The maximum cold inflation pressure to which a tire may be inflated.

Maximum loaded vehicle weight

The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

Measuring rim

The rim on which a tire is fitted for physical dimension requirements.

Pin Weight

The downward force applied to the 5th wheel or gooseneck ball, by the trailer kingpin or gooseneck coupler.

Non-pneumatic rim

A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

Non-pneumatic spare tire assembly

A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

Non-pneumatic tire

A mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle and does not rely on the containment of any gas or fluid for providing those functions.

Non-pneumatic tire assembly

A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

Normal occupant weight

This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

Occupant distribution

The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

Open splice

Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

Outer diameter

The overall diameter of an inflated new tire.

Overall width

The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

**Ply**

A layer of rubber-coated parallel cords.

Ply separation

A parting of rubber compound between adjacent plies.

Pneumatic tire

A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

Production options weight

The combined weight of those installed regular production options weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

Radial ply tire

A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the centerline of the tread.

Recommended inflation pressure

This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Certification / VIN tag.

Reinforced tire

A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Rim

A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

Rim diameter

This means the nominal diameter of the bead seat.

Rim size designation

This means the rim diameter and width.

Rim type designation

This means the industry of manufacturer's designation for a rim by style or code.

Rim width

This means the nominal distance between rim flanges.

Section width

The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

Sidewall

That portion of a tire between the tread and bead.

Sidewall separation

The parting of the rubber compound from the cord material in the sidewall.



Special Trailer (ST) tire The "ST" is an indication the tire is for trailer use only.

Test rim

The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

Tread

That portion of a tire which comes in contact with a road.

Tread rib

A tread section running circumferentially around a tire.

Tread separation

Pulling away of the tread from the tire carcass.

Tread wear indicators (TWI)

The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

Vehicle capacity weight

The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.

Vehicle maximum load on the tire

The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

Vehicle normal load on the tire

The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49 571.110) and dividing by 2.

Weather side

The surface area of the rim not covered by the inflated tire.

Wheel center member

In the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and the vehicle.

Wheel-holding fixture

The fixture used to hold the wheel and tire assembly securely during testing.



1.4. TIRE SAFETY - EVERYTHING RIDES ON IT

The National Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

http://www.nhtsa.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This booklet presents a comprehensive overview of tire safety, including information on the following topics:

- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires
- Tire safety tips.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

1.5. SAFETY FIRST—BASIC TIRE MAINTENANCE

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Underinflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

1.5.1. FINDING YOUR VEHICLE'S RECOMMENDED TIRE PRESSURE AND LOAD LIMITS

Tire information placards and vehicle certification labels contain information on tires and load limits.

These labels indicate the vehicle manufacturer's information including:

Recommended tire size

Recommended tire inflation pressure

Vehicle capacity weight (VCW—the maximum occupant and cargo weight a vehicle is designed to carry)

Front and rear gross axle weight ratings (GAWR—the maximum weight the axle systems are designed to carry).

Both placards and certification labels are permanently attached to the trailer near the left front.



1.5.2. UNDERSTANDING TIRE PRESSURE AND LOAD LIMITS

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure—measured in pounds per square inch (psi)—a tire requires to be properly inflated. (You will also find this number on the vehicle information placard expressed in kilopascals (kpa), which is the metric measure used internationally.)

Manufacturers of passenger vehicles and light trucks determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.) Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

1.5.3. CHECKING TIRE PRESSURE

It is important to check your vehicle's tire pressure at least once a month for the following reasons:

- Most tires may naturally lose air over time.
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.
- With radial tires, it is usually not possible to determine under inflation by visual inspection.

For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets.

The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

1.5.4. STEPS FOR MAINTAINING PROPER TIRE PRESSURE

- Step 1: Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
- Step 2: Record the tire pressure of all tires.
- Step 3: If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.
- Step 4: If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
- Step 5: At a service station, add the missing pounds of air pressure to each tire that is underinflated.
- Step 6: Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).



If you have been driving your vehicle and think that a tire is underinflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly underinflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly underinflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

1.5.5. TIRE SIZE

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owner's manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

1.5.6. TIRE TREAD

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires. Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

1.5.7. TIRE BALANCE AND WHEEL ALIGNMENT

To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

1.5.8. TIRE REPAIR

The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

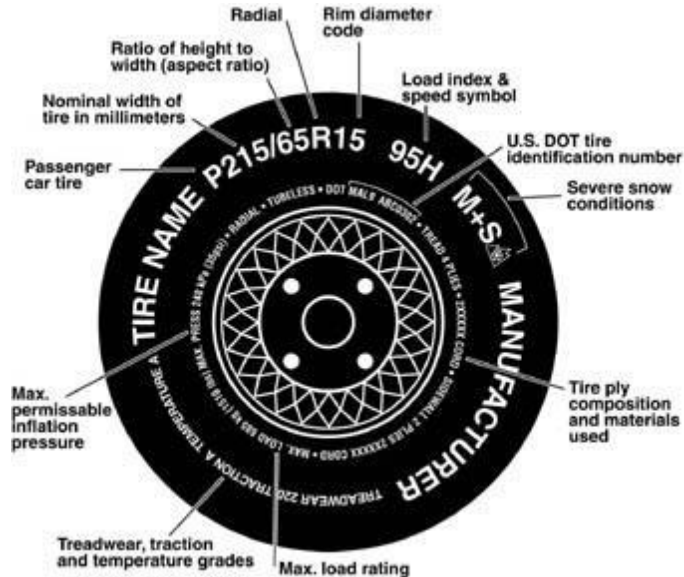
1.5.9. TIRE FUNDAMENTALS

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.



1.5.9.1. Information on Passenger Vehicle Tires

Please refer to the diagram below.



P

The "P" indicates the tire is for passenger vehicles.

Next number This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Next number This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

R The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

Next number This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Next number This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

M+S The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

Speed Rating The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below. Note: You may not find this information on all tires because it is not required by law.



Tire Safety Information

Letter Rating	Speed Rating
Q	99 mph
R	106 mph
S	112 mph
T	118 mph
U	124 mph
H	130 mph
V	149 mph
W	168* mph
Y	186* mph

* For tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph, tire manufacturers always use the letters ZR.

U.S. DOT Tire Identification Number This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

Tire Ply Composition and Materials Used The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

Maximum Load Rating This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

Maximum Permissible Inflation Pressure This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

1.5.9.2. UTQGS Information

Treadwear Number This number indicates the tire's wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down. For example, a tire graded 400 should last twice as long as a tire graded 200.

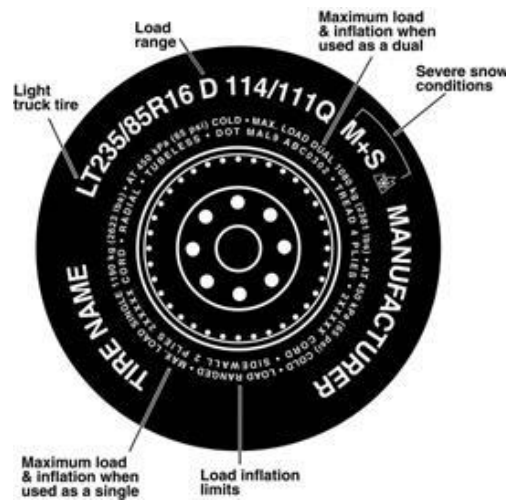
Traction Letter This letter indicates a tire's ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA", "A", "B", and "C".

Temperature Letter This letter indicates a tire's resistance to heat. The temperature grade is for a tire that is inflated properly and not overloaded. Excessive speed, under inflation or excessive loading, either separately or in combination, can cause heat build-up and possible tire failure. From highest to lowest, a tire's resistance to heat is graded as "A", "B", or "C".



1.5.9.3. Additional Information on Light Truck Tires

Please refer to the following diagram.



Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

LT The "LT" indicates the tire is for light trucks or trailers.

ST An "ST" is an indication the tire is for trailer use only.

Max. Load Dual kg (lbs) at kPa (psi) Cold This information indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

Max. Load Single kg (lbs) at kPa (psi) Cold This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range This information identifies the tire's load-carrying capabilities and its inflation limits.

1.6. TIRE SAFETY TIPS

Preventing Tire Damage

Slow down if you have to go over a pothole or other object in the road.

Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.