American Road Machinery, Inc.
17 CUBIC YARD CHASSIS OR ROLLOFF MOUNT LEAF COLLECTOR July 2008

GENERAL:

This specification describes a self-contained engine-driven vacuum leaf collecting machine. The leaf collector is trailer mounted, designed for one-person operation, and capable of picking up and completely mulching leaves from curb sides, median strips, ditches, open spillways, and other areas, then depositing the mulch in an integral 17 cubic yard all-steel hopper.

POWER UNIT: (Deere 5030TII 84)

Type:	In-Line 5 cylinder, 4-cycle, Turbo diesel.
Displacement:	186 Cubic Inches (3 Liters)
Gross Power:	82 HP (61.5 kW) Intermittent at 2500 RPM.
Instruments:	Curb side, in shock-mounted panel. Vernier type throttle. On/Start/Off Switch. Voltmeter. Combination Tachometer - Hour Meter Water temperature, with safety shut-off. Oil pressure, with safety shut-off.
Accessories:	Gear-driven variable speed governor. Gear-driven Hydraulic Pump, 18.6 GPM at 1800 PSI.
Alternator:	70 Ampere.
Battery:	950 Cold Cranking Amps, 185 Minute Reserve.
Muffler:	Vertical, external.
Fuel Tank:	30 U.S. Gallons - High density, cross linking, non-permeating polyethylene. Molded as one piece, no weld seams or add-ons.

RADIATOR SCREEN:

A pleated aluminum auxiliary screen, mounted in a hinged frame, is provided, for additional protection to the radiator with no reduction of air flow.

FAN DRIVE:

The suction fan is direct driven by an 11-1/2" heavy duty over-center clutch through a 2-1/4" diameter straight output shaft. The fan hub is coated with anti-seize material and is positioned on the shaft by a 5/8" square by 4-1/4" long key and secured by a 1"-14 by 2" long grade 5 bolt and split 'lock' washer. The 1" bolt clamps a 1/2" by 4" flat washer to the end of the output shaft and the washer is secured to the fan hub with four 3/8"-16 by 1" socket head cap screws and split 'lock' washers. The clutch housing has a double lip seal. The clutch shaft has a sealed pilot bearing and two 2-1/4" I.D. tapered roller

bearings, each with a basic rating of 3,370 pounds radial and 2,330 pounds thrust. The clutch handle is extended to provide easy access by the operator, allowing engagement and disengagement of the fan while the engine is running.

SUCTION FAN:
The fan is 25" diameter, 8-1/4" wide at the tip and has a minimum of six radial blades. The fan backing plate is 1/4" thick steel and the blades are 3/8" thick AR400 abrasion resisting alloy steel with 1/8" formed reinforcing welded to the back faces. After welding, the complete fan is stress relieved for two hours at 1100 degrees F. This treatment relieves stresses induced by welding and reduces the possibility of weld failure due to shock loads. The fan produces 16,600 C.F.M. of air movement through a 16" diameter by 10' long hose under normal working conditions.

FAN TO HOUSING EFFICIENCY:
A high efficiency fan and housing design combines a 25" diameter fan and low fan tip clearance. This provides substantial engine horsepower reserve for picking up dense debris under adverse conditions and prevents engine stall-out. It also prevents excessive material build-up in the fan housing and produces the most efficient ratio of intake material to hopper air exhaust.

FAN HOUSING:
The fan housing is approximately 32-3/8" high, 34-1/4" long, and 10-1/2" wide, made of 1/4" steel plate. For added resistance to abrasive debris, the housing includes a two-piece replaceable liner made of 1/4" thick steel. To prevent worn liner sections from being drawn into the rotating fan blades, the sections are secured by ten alloy steel flat head socket cap screws and stover lock nuts. The fan housing is rigidly attached to the engine frame. To prevent severe engine and P.T.O. damage should large foreign objects be sucked into the blower housing, the back of the blower housing incorporates a safety band clamped to the P.T.O. housing, to divert shock loads to the engine frame rather than to the P.T.O. housing and engine block. Fan removal is accomplished by removing eleven bolts on the adaptor flange at the front of the housing. In order to change the fan, it is not necessary to remove the entire blower housing.

HINGED HOSE ADAPTOR:
At the fan inlet, a hinged hose adaptor is provided, to allow storage of the suction hose for transport.

FAN DISCHARGE:
Discharge is directly from the fan housing to the hopper via a 10 gauge all steel welded chute. The chute has a break-away connection with a 1/4" thick top plate sealed by a half inch thick closed-cell foam rubber gasket.

SUCTION HOSE:
The suction hose is 16" diameter, 10' long and includes a tube, carcass, reinforcing wire, cover, and cuff. The tube is abrasion-resistant NC/SBR and the inner surface has a wax blooming rubber liner that resists wear, reduces friction, and decreases build-up of leaf material. The carcass is multi-ply woven polyester fabric. The reinforcing wire is 0.177" diameter spring steel rolled at 1-1/2" pitch for easy flexing and long life. The

cover consists of black abrasive resistant neoprene over the entire outside of the hose, providing excellent wear and resistance to weather, oil, and ozone. Each end has straight heavy cuffs to allow bolting for strong installation. The hose weighs 7.5 pounds per foot to combine flexibility with heavy duty performance. A metal operator handle and arm assembly is provided at the intake. Pick-up is from the curb side with no interruption of normal traffic flow.

HYDRAULIC HOSE SUPPORT:
A 12 volt electric-hydraulic power unit provides up and down movement of the standard hose boom. This is done through a two inch cylinder that is activated with push button switches mounted in a hand held pendant which can be mounted at the operator's station. The hose support hydraulic system is independent of the hopper dump circuit.

HOPPER AND HOPPER FRAME:
The hopper frame is 100-3/4" wide, 99" long and made of 5" @ 9 pounds per foot channel supporting the full length and width of the hopper. The main channels are 34" wide by 98-3/4" long and are welded to the cross channels in such a way as to maintain a 5" overall height. The hopper and frame assembly form a unitized structure. The hopper dimensions are 101" wide, 99" long, and 80" high, creating a capacity of 17 cubic yards. This hopper capacity is achieved without an excessive front hopper extension.

The hopper is made from 12 gauge sheet steel all welded construction with three supporting ribs of 3" structural channel encircling the hopper for strength. The inside of the hopper is smooth for ease of dumping a fully packed load. The top of the hopper has three slide-in filter screens in three framed steel sections reinforced with 1-1/2" expanded metal. The replaceable aluminum mesh screen is bolted to the screen frames.

The hopper assembly is attached to the main frame by a 3/8" thick steel plate hinge assembly which is formed, bushed, and welded to the rear of the hopper frame. This hinge assembly attaches to the main frame with a 1-1/2" diameter by 39" long steel pin.

REAR DOORS:
Units are available with either a single one piece top hinged rear door or dual side hinged rear doors.

Top Hinged Door:
The hopper has a one-piece top hinged rear door with spring-compensated counter-balance to aid in holding the door open for dumping. The door is made of 12 gauge sheet steel, formed at a 45 degree angle, 8-1/2" from the top and bottom edges. The inside of the door is reinforced on all sides, creating a unitized box around the perimeter of the door. The top and bottom reinforcing angles are 7" by 7" by 12 gauge and the side reinforcing angles are 3" by 3" by 3/16". The door hinges are 1/4" steel and incorporate a connecting eye for the counter balance springs. The springs are 3" in diameter with a 24" free length, made from 0.4" diameter wire, and positioned 3" above the top of the hopper. Each spring generates a 460 pound load when extended 10" and 800 pounds when extended 18". Each spring has a tension adjustment of 9" at the hopper end of the spring connection. Plates of 3/16" steel are welded to the bottom of

the door to create a positive, easy operated door lock.

Dual Side Hinged Rear Doors:
Two piece heavy duty side hinged overlapping rear doors that open with ease and can be locked into place while dumping. Each door opens 270 degrees and is securely held in place by 3 welded custom hinges. The rear doors open and close via dual cam type lock rods with keeper locks to create a strong, tight fit. Each door is fabricated using 3/16 inch flat sheet steel framed by 1-1/2" x 3" x 1/8" thick square tubing.

HYDRAULIC SYSTEM:
The leaf collector has an independent hydraulic pump driven by the engine (not electric driven) to power the hopper dump cylinder. The hopper is self dumping, using a 4" diameter two-stage hydraulic cylinder with a capacity of 28,000 pounds, applied directly upward at the front of the hopper. This front mounted cylinder provides a positive mechanical advantage which permits smaller diameter cylinders at lower operating pressure, compared to high pressure, negative mechanical scissor type hoists. The hydraulic system includes an oil tank, valve for operating the hopper dump cylinder, hydraulic hoses, and all connections.

LIGHTS:
The unit is equipped with LED lights and reflectors in accordance with Federal Motor Vehicle Safety Standards.

PAINT:
The hopper, engine cover, and fan housing are thoroughly cleaned and given two coats of rust inhibiting primer and two coats of white finish. The trailer frame and axles are similarly primed, and finished in black.

DEVIATIONS:
Bidders must offer a regularly-manufactured machine and supply descriptive literature and complete specifications. All deviations from and exceptions to this specification must be completely explained and included with the bid. Otherwise the purchasing authority will assume the proposed machine to be exactly as described above and, after delivery, may return the machine for noncompliance with the specifications.

OPTIONAL EQUIPMENT

WARNING BEACON:
A 360 degree amber rotating beacon is installed on the hopper so that it is visible from the sides and rear of the unit and wired to operate when the engine is running.

HOSE QUICK DISCONNECT:
The suction hose is connected to the blower housing adaptor without the use of bolts or wing nuts. The Quick Disconnect device includes a flange on the end of the suction hose, a split ring attached to the blower housing, and an over-center clamp for locking the split ring over the hose flange. A safety cover is also provided, for use when the suction hose is removed. The safety cover is similarly retained by the split ring and over-center clamp.

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FLUID COUPLER:

The suction fan is direct driven by a heavy duty fluid coupler through a 2 1/4" diameter straight output shaft. The fan hub is coated with anti-seize material and is positioned on the shaft by a 5/8" square by 4-1/4" long key and secured by a 1"-14 by 2" long grade 5 bolt and split 'lock' washer. The 1" bolt clamps a ½" by 4" flat washer to the end of output shaft and the washer is secured to the fan hub with four 3/8"-16 by 1" socket head cap screws and split 'lock' washers. The housing has a double lip seal. The fluid coupler has a sealed pilot bearing and heavy duty roller bearings. The fluid coupler provides smooth engagement as the engine RPM is increased from idle and disengages when the engine RPM is returned to idle. This eliminates clutch wear and damage done by high RPM engagement that can occur with any clutch type PTO.

FOUR-WAY HYDRAULIC HOSE BOOM:

The hose support boom attaches to an all steel formed and reinforced bracket which is bolted to the fan housing, allowing dumping of the hopper without disconnecting the hose. The horizontal arms are 4" x 1-½ "structural rectangular tubing with a 1/8" thick wall. The boom assembly shall be capable of moving up and down, left and right. The boom shall be controlled by an in cab joystick, or wireless handheld pendent, that allows the operator to control the hose movement, the engine RPM, and kill the engine in case of an emergency. The boom's hydraulic source shall be the leaf collector engine through a gear driven hydraulic pump. There shall be a flow control valve which controls the hydraulic oil flow to the boom control valve. The boom shall have two double acting hydraulic cylinders that facilitate its movements. The Two hydraulic cylinders are 2" diameter x 10" stroke.

SIX-WAY HYDRAULIC HOSE BOOM

The hose support boom attaches to an all steel formed and reinforced bracket which is bolted to the fan housing, allowing dumping of the hopper without disconnecting the hose. The horizontal arms are 4" x 1-½ "structural rectangular tubing with a 1/8" thick wall. The boom assembly shall be capable of moving up and down, left and right, and the end of the hose in and out. The boom shall be controlled by an in cab joystick, or wireless pendent that allows the operator to control the hose movement, the engine RPM, and kill the engine in case of an emergency. The boom's hydraulic source shall be the leaf collector engine through a gear driven hydraulic pump. There shall be a flow control valve which controls the hydraulic oil flow to the boom control valve. The boom shall have three double acting hydraulic cylinders that facilitate its movements. Two 2" diameter x 10" and one 2" diameter x 6" stroke.

CHIPPER REAR DOOR ASSEMBLY:

The leaf collector door shall be equipped with a 32" x 70" chipper door. It shall be hinged at the bottom with five butt hinges that allow the door to lay flat against the leaf collector door when in the open position. The door shall be constructed of ten gauge steel with two grab hooks, one on each side of center, to assist in opening and closing the door. The door shall be held closed by a series of stainless steel studs welded to the top of the chipper door opening and mating holes in the top of the chipper door. There shall be a one inch rubber strip around the door opening to seal it when closed. The door opening shall be reinforced at the sides and top by ¼" thick angle and at the bottom by a 3" channel. There shall be a hinged door provided to cover the exhaust

chute opening in the leaf collector hopper to prevent wood chips from entering the leaf collector fan housing.