

**SPECIFICATION
FOR
SCRAPER, SELF-PROPELLED, OPEN BOWL TYPE**

(This specification is released for procurement purposes until revised or rescinded.)

SCOPE

This specification covers a four wheel, pneumatic tired, self-propelled, open bowl type, diesel powered scraper. It does not include all types and sizes of commercially available pneumatic tired scrapers, but only the size generally used by the North Carolina Department of Transportation, Division of Highways.

I. CLASSIFICATION

The scraper shall be of the size and capacity as specified in Table 1.

II. APPLICABLE STANDARDS

The following documents of issue in effect on the date of the Invitation for Bids shall form a part of this specification to the extent specified:

- SAE J321 - Tire Guards for Protection of Operator
- SAE J386 - Seat Belts
- SAE J728 - Scrapers; Nonmenclature
- SAE J764 - Loading Ability Test code
- SAE J919 - Sound Measurement
- SAE J957 - Elevating Scrapers; Capacity Rating
- SAE J1040 - Roll-over Protective Structures (ROPS)
- SAE J1083 - Unauthorized Starting or Movement of Machines
- SAE J1152 - Braking Performance
- SAE J1349 - Engine Power Test Code

Society of Automotive Engineers, Inc. (SAE)
400 Commonwealth Drive
Warrendale, PA 15096

Occupational Safety and Health Act Standards (Federal)
U.S. Department of Labor
200 Constitutional Avenue, NW
Washington, DC 20210

Occupational Safety and Health Act Standards (State)
N.C. Department of Labor
OSHA Division
4 West Edenton Street
Raleigh, NC 27611

III. REQUIREMENTS

A. GENERAL

The scraper shall be of conventional design and heavy duty construction. It shall be complete with all necessary operating accessories customarily furnished by the manufacturer with this type scraper whether stipulated herein or not, together with such modifications and attachments as may be necessary to enable the unit to function reliably and efficiently in sustained operation.

1. Standard Products

The scraper offered shall be a new current production model of latest design and equipped as specified herein. The component parts of the unit need not be the product of the same manufacturer.

2. Use Conditions

Design and construction shall be such that the scraper will withstand the extremely hard usage encountered in service, such as scraping, transporting, ejection of materials, operation over rough terrain, and storage and operation in the open air under all weather conditions for extended periods of time. Components, particularly of the electrical, fuel, and exhaust systems shall be so designed as to resist any harmful effects of dust or water (salt or fresh).

3. Ease of Maintenance

The design of the scraper and accessory installations shall permit ready accessibility for servicing, replacement, and adjustment of component parts and accessories with minimum disturbance of other elements.

4. Frame

The frame shall be designed to withstand maximum stress under normal operating conditions and in addition, provide adequate support for attaching any device approved by the scraper manufacturer for use in combination with the scraper.

5. Scraper Operating Weight, Empty

The scraper operating weight shall be the empty weight and shall include manufacturer's standard accessories, standard tire sizes, fully serviced, including full fuel tank and 175 pound operator and complete with hydraulic controls, fully enclosed cab and ROPS. Operating weight shall be as specified in Table 1, Section III.B.

6. Occupational Safety and Health Act

The loader shall be furnished with all applicable equipment and accessories as required by the Occupational Safety and Health Act (U.S. Department of Labor and N.C. Department of Labor), including the following:

29 CFR 1926.52 - Occupational Noise Exposure

The loader shall be constructed and assembled so that the noise at ear level of the seated operator, with all doors, windows and vents open; when measured in accordance with SAE-J1166 - Work Cycle Test, shall not exceed the permissible noise exposure limits of this regulation for 8-hour operator exposure.

29 CFR 1926.600 - Equipment

Safety glass for enclosed cab.

29 CFR 1926.602 - Material Handling Equipment
Seat belts, brakes, fenders, horn and back-up alarm.

29 CFR 1926.100 - Rollover Protective Structures (ROPS)
Cab with integral ROPS.

29 CFR 1910.145 - Specifications for Accident Prevention
Signs and Tags
Slow moving vehicle emblem.

B. OPERATING AND DIMENSIONAL REQUIREMENTS

The requirements given below are minimum unless otherwise noted.

Table I, Operating and Dimensional Requirements

- Rated Cubic Yard Capacity (SAE Heaped)	11
- Rim Pull at 3 MPH, at Loaded Weight, and 20% Resistance (Lbs.)	10,000
- Net Brake Horsepower (SAE J-1349)	160
- Operating Weight, Empty (Lbs.)	30,000
- Transmission:	
Number of Speeds, Forward/Reverse	4/1
Travel Speed, Forward (MPH)	20.0
- Non-Stop 180 Degree Turning Width (Max, Ft)	32'-0"
- Width of Cut (in)	105"
- Depth of Cut (in)	6.0"
- Tire Tread Width, Center to Center (in)	64"

C. ENGINE

1. Diesel Engine

The engine shall be full diesel, water cooled, and of the compression ignition type, two or four-stroke cycle, capable of operating on commercial diesel fuel as recommended by the manufacturer. The engine shall be equipped with an adequate and efficient fuel injection mechanism, heavy duty fuel oil filter system and heavy duty full flow type lubricating oil filter. The minimum net brake horsepower at the flywheel shall be shown in Section III.B of this specification.

2. Air Cleaner

The air cleaner shall be the dual element type (primary and safety dry type elements) with a built-in precleaner section and automatic dust ejection. The air cleaner hose shall be of the metal or heavy duty flexible, non-collapsible type, with metal or molded rubber elbows. Wire reinforced hose is not acceptable. All connections shall be banded.

3. Engine Governor

The engine governor shall be of the mechanical or hydraulic type and shall be driven from the engine. Provisions shall be made for permitting regulation of the governed speed throughout the engine load range while the engine is in operation.

4. Engine Starting System

The manufacturer's standard electric starting system with battery shall be acceptable for cranking the scraper engine. The engine starting system shall be of ample power to crank the scraper engine at sufficient speed for starting when the engine is cold. A means shall be provided to lock the starting controls and a concealed electrical disconnect shall be provided (SAE J1083).

5. Engine Cooling System

The unit shall have a heavy duty radiator and blade type fan. The cooling system shall be protected to a minimum of -20°F.

6. Engine Lubrication System

The manufacturer's current standard production lubrication system shall be acceptable.

D. SCRAPER

The scraper shall have an SAE-J-957 minimum rated capacity of 11 cubic yards (heaped). The minimum width of cut and other requirements shall be as specified in Table 1, Section III.B. The scraper shall be the open bowl type. The scraper shall be designed to completely eject and clean bowl sides with each discharge. The scraper shall have rear push block, cutting edge, teeth and drop center cutting edge. (All cutting edges shall be reversible). All scraper operations shall be controlled from the tractor at the operator's station.

E. FUEL TANK

The manufacturer's standard fuel tank(s) shall be acceptable and located so as not to be affected by heat from the engine, exhaust pipe, or muffler.

F. ENGINE TO TRANSMISSION DRIVE

Hydraulic Torque Converter

The hydraulic torque converter shall be the manufacturer's standard for the size engine furnished with torque capacity exceeding the maximum delivered engine torque.

G. TRANSMISSION

1. Torque Converter Drive Transmission

The scraper shall be furnished with a torque converter drive transmission of the power shift type. The transmission shall be provided with not less than the number of speed ranges and traveling speeds specified in Table 1, Section III.B.

2. Transmission Input Torque Capacity

The transmission input torque capacity shall be greater than the maximum gross torque developed by the combination of the engine and the torque converter.

H. STEERING DEVICES

The manufacturer's standard current production power steering devices for self-loading, self-propelled elevating scrapers shall be acceptable.

I. POWER TRAIN

The power train shall consist of manufacturer's standard drive shaft, axle and final drive for front wheels. All components shall be furnished with torque capacity exceeding the maximum to which they will be subjected.

J. TIRES

Tires on all wheels shall be of the same size and 23.5 x 25, 16 ply. Tires shall be premium quality, tubeless, nylon, tractor tread type or equivalent. The minimum wheel tread width between the centers shall not be less than that given in Table 1, Section III.B.

K. BRAKE SYSTEMS

The service brake system shall be air or hydraulically activated and foot pedal controlled. The service brake, emergency stopping, and parking systems shall conform to the requirements for SAE-J1152.

L. HYDRAULIC SYSTEM

Manufacturer's standard hydraulic system shall be provided.

M. OPERATOR'S SEAT AND CONTROLS

The operator's seat shall be located within easy and convenient reach of all controls. It shall provide for comfortable riding positions and for good visibility of the work zone. A weather-proof foam upholstered, adjustable, shock-absorbing, bucket seat with seat belt shall be furnished. The seat belt shall conform to SAE-J386.

N. PAINTING

Scraper shall be painted, N.C. Division of Highways Yellow, Moline MPM# 11-Y169A leadfree or equal, over a proper rust inhibitive primer. Cab interior shall be painted a neutral, non-glare color.

O. TOOLS AND LUBRICATING EQUIPMENT

Special tools and lubricating equipment normally furnished with the scraper by the manufacturer shall be provided. A tool box with hasp and padlock shall be provided.

P. INSTRUMENTS AND GAUGES

The instrument panel shall be located convenient to the seated operator. The manufacturer's standard instrument package shall be provided unless otherwise specified in the Invitation for Bids.

Q. EQUIPMENT

The scraper shall be furnished with the following accessories and equipment:

1. Crankcase guard, heavy duty radiator brush guard, transmission guard.
2. Deflector type exhaust stack.
3. Front pull hook.
4. Locking type caps for fuel, radiator, engine oil filter, and hydraulic tanks.
5. Front headlights and rear taillights, dash lights, and directional signals.

6. Horn, and slow moving vehicle emblem.
7. Air cleaner rain cap.
8. Air filter service indicator.
9. Cold weather starting aid (power-cartridge type primer).
10. Front fenders.
11. Differential lock.
12. Concealed electrical disconnect

R. ROPS CAB

The scraper shall be furnished with a ROPS cab, conforming to SAE J1040. The cab shall be a fully enclosed waterproof steel structure with tinted safety glass throughout. It shall also be designed to give the operator a full view of the machine operations in all directions. The cab shall have at least one door with handle, hold open latch and keyed lock. Window or door glass on each side shall open and be equipped with inside locks or latches. The windshield shall be full view designed and shall be equipped with a heavy duty windshield wiper and washer. The cab shall also be equipped with a heavy duty heater and defroster. Two heavy duty rear view mirrors shall be provided and mounted on either side of the cab to give the operator full view to the rear.

IV. WARRANTY

The contractor warrants to the owner that all equipment furnished under this specification will be new, of good material and workmanship, and agrees to replace promptly any part or parts which by reason of defective material or workmanship shall fail under normal use, free of negligence or accident, for a minimum period of 24 months from the date put in operation. Such replacement shall include all parts, labor, and transportation costs to the location where equipment is down, free of any charge to the owner or his representative.

Under same and all conditions as above, the power train (engine, transmission, torque converter, and final drive) shall be covered for an additional period of at least 12 months. Any periodic inspections which may be performed by the contractor or his representative shall be without charge to the owner.

V. SERVICE, PARTS, AND MANUALS AND LINE SETTING SHEET

The contractor shall furnish a qualified representative to instruct the owner's operator(s) in the operation and maintenance of the equipment for a minimum period of eight hours.

Operator's manuals, shop manuals, parts books and line setting sheet shall be furnished as specified in the Invitation for Bids.

VI. ACCEPTANCE EVALUATION AND QUALITY ASSURANCE

Upon receipt of each scraper at the receiving point the purchaser or his authorized representative shall arrange for an acceptance inspection for compliance with the provisions of this specification.

The contractor shall furnish a pilot model for examination, test (SAE-J764) and possible modification and/or adjustment of attachments in accordance with this specification.

VII. DELIVERY AND PAYMENT

Delivery of and payment for scrapers under this specification shall be in accordance with the terms and conditions of the Invitation for Bids. The contractor shall be responsible for any packing, packaging, or protection required to insure delivery in an undamaged condition.

Scrapers shall be completely serviced and ready for operation when delivered.

VIII. ORDERING DATA (For Purchaser's Use Only)

Purchasers should exercise any desired options offered herein and should specify the following in the Requisition and Invitation For Bids.

1. Title, number, and date of this specification.
2. Number of sets of operator's manuals, parts books shop manuals and line setting sheets to be furnished.
3. If special instrumentation is to be provided.
4. If pilot model is not to be provided.
5. If instructor is not to be provided.