

SPECIFICATION
FOR
TRACTORS, CRAWLER

(THIS SPECIFICATION IS RELEASED FOR PROCUREMENT PURPOSES UNTIL REVISED OR RESCINDED.)

SCOPE

THIS SPECIFICATION COVERS DIESEL ENGINE-DRIVEN CRAWLER TRACTORS WITH DOZER. IT DOES NOT INCLUDE ALL TYPES AND SIZES OF COMMERCIALY AVAILABLE CRAWLER TRACTORS, BUT ONLY THOSE TYPES AND SIZES USED BY THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS.

I. CLASSIFICATION

TABLE 1

SIZE	NET FLYWHEEL HORSEPOWER (HP)*	OPERATING WEIGHT (LBS.)	DRAWBAR PULL @ 1.2 MPH (LBS.)**	TRACK ON GROUND (IN.)	TRACTOR GAUGE (IN.)
1	140	29,000	25,000	93	73
2	140	31,500	27,500	93	73
3	145	36,000	30,000	95	73
4	165	37,000	32,000	102	73

* IN ACCORDANCE WITH SAE J1349

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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:

J872	RESERVE TRACTIVE ABILITY TEST CODE.
J930	STORAGE BATTERIES FOR OFF-ROAD WORK MACHINES
J1040	ROBS
J1166	SOUND MEASUREMENT-EARTH MOVING MACHINERY-OPERATOR-WORK CYCLE
J1349	ENGINE POWER TEST CODE

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)
400 COMMONWEALTH DRIVE
WARRENDALE, PA 15096

FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT CODES
U. S. DEPARTMENT OF LABOR
200 CONSTITUTION AVENUE, NW
WASHINGTON, DC 20210

STATE OCCUPATIONAL SAFETY AND HEALTH ACT CODES

III. REQUIREMENTS

A. GENERAL

THIS SPECIFICATION COVERS DIESEL ENGINE-DRIVEN, CRAWLER TRACTORS AND ALLIED ATTACHMENTS OF CONVENTIONAL DESIGN AND HEAVY DUTY CONSTRUCTION. THEY ARE TO BE FURNISHED WITH ALL OPERATING ACCESSORIES CUSTOMARILY FURNISHED AS STANDARD EQUIPMENT BY THE MANUFACTURER WHETHER STIPULATED HEREIN OR NOT.

1. STANDARD PRODUCTS

THE TRACTOR OFFERED SHALL BE NEW AND A STANDARD PRODUCTION MODEL OF LATEST DESIGN AND EQUIPPED AS SPECIFIED HEREIN.

2. USE CONDITIONS

DESIGN AND CONSTRUCTION SHALL BE SUCH THAT THE TRACTOR WILL WITHSTAND EXTREMELY HARD USAGE INCLUDING OPERATION OVER ROUGH TERRAIN, STORAGE AND OPERATION IN THE ENVIRONMENT ENCOUNTERED IN THIS TYPE SERVICE. COMPONENTS, PARTICULARLY OF THE ELECTRICAL, FUEL, AND EXHAUST SYSTEMS SHALL BE SO DESIGNED AS TO RESIST ANY HARMFUL EFFECTS OF DUST OR FRESH WATER.

3. EASE OF MAINTENANCE

THE DESIGN OF THE TRACTOR 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 STRESSES UNDER NORMAL OPERATING CONDITIONS AND IN ADDITION, PROVIDE ADEQUATE SUPPORT FOR ATTACHING ANY DEVICE APPROVED BY THE TRACTOR MANUFACTURER FOR USE IN COMBINATION WITH THE TRACTOR.

5. OPERATING WEIGHT

FOR PURPOSES OF DETERMINING THE TRACTOR DRAWBAR PULL (SAE-J872), THE WEIGHT SHALL REPRESENT THE TRACTOR EQUIPPED AS FOLLOWS: ROPS CANOPY, 175 POUND OPERATOR, FUEL, OIL, WATER, LUBRICANTS, STANDARD ADVERTISED TRACK SHOES, HYDRAULIC CONTROLS, AND A COMPLETELY EQUIPPED STRAIGHT BLADE WITH HYDRAULIC TILT. NOT MORE THAN THE FOLLOWING ATTACHMENTS SHALL BE INCLUDED IN THE OPERATING WEIGHT: CRANKCASE, TRANSMISSION, AND RADIATOR GUARDS. THE MINIMUM OPERATING WEIGHT FOR EACH SIZE TRACTOR SHALL BE AS SHOWN IN TABLE 1.

6. OCCUPATIONAL SAFETY AND HEALTH ACT

THE TRACTOR 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).

29 CFR 1926.52 OCCUPATIONAL NOISE EXPOSURE

THE TRACTOR SHALL BE CONSTRUCTED AND ASSEMBLED SO THAT THE NOISE AT EARLEVEL OF THE SEATED OPERATOR WITH ALL DOORS, WINDOWS, AND VENTS CLOSED, WHEN MEASURED IN ACCORDANCE WITH SAE J1166-WORK CYCLE TEST, SHALL NOT EXCEED THE PERMISSIBLE NOISE EXPOSURE LIMITS OF THIS REGULATION FOR AN 8-HOUR OPERATOR EXPOSURE.

29 CFR 1926.600 EQUIPMENT

SAFETY GLASS FOR ENCLOSED CAB.

29 CFR 1926.602 MATERIAL HANDLING EQUIPMENT

SEAT BELTS

29 CFR 1926.100 ROLLOVER PROTECTIVE STRUCTURES (ROPS)

CAB WITH INTEGRAL ROPS.

7. DRAWBAR PULL

THE TRACTOR, WHEN EQUIPPED AS SPECIFIED IN OPERATING WEIGHT (SEE ITEM III.A.5.), SHALL DELIVER NOT LESS THAN THE MINIMUM DRAWBAR PULL AT A GROUND SPEED OF NOT LESS THAN 1.2 MPH AS SHOWN IN TABLE 1 FOR EACH SIZE TRACTOR. THE DRAWBAR PULL SHALL BE THE RESERVE TRACTIVE FORCE AS SHOWN IN SAE J872. THE MANUFACTURER'S CERTIFIED OPERATING WEIGHT AND DRAWBAR PULL SHALL BE FURNISHED BY THE BIDDER UPON REQUEST.

B. ENGINE

1. DIESEL ENGINE

THE ENGINE SHALL BE OF THE COMPRESSION IGNITION TYPE, TURBO CHARGED, 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 EJECTION MECHANISM, HEAVY DUTY FUEL OIL FILTER SYSTEM AND HEAVY DUTY FULL FLOW TYPE LUBRICATING OIL FILTER.

2. AIR CLEANER

THE AIR CLEANER SHALL BE THE DUAL ELEMENT TYPE (PRIMARY AND SAFETY DRY TYPE ELEMENT) WITH A BUILT-IN PRECLEANER AND AUTOMATIC DUST EJECTION. THE AIR CLEANER HOSE SHALL BE OF 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 EITHER THE MECHANICAL OR HYDRAULIC TYPE, AND DRIVEN FROM THE ENGINE. PROVISIONS FOR PERMITTING REGULATION OF THE GOVERNED SPEED-SETTING THROUGHOUT THE ENGINE LOAD RANGE WHILE THE ENGINE IS IN OPERATION SHALL BE INCLUDED.

4. ENGINE STARTING SYSTEM

THE MANUFACTURER'S STANDARD OR OPTIONAL ELECTRIC STARTING SYSTEM, INCLUDING HEAVY DUTY BATTERY(IES) (SAEJ930) FOR CRANKING THE TRACTOR ENGINE SHALL BE ACCEPTABLE. THE STARTING SYSTEM SHALL BE CAPABLE OF CRANKING THE ENGINE IN AN AMBIENT TEMPERATURE OF -20 DEGREES FAHRENHEIT. THE BATTERY(IES) SHALL BE DESIGNED TO WITHSTAND THE SHOCK, VIBRATION AND DUSTY ENVIRONMENT ENCOUNTERED IN OFF-ROAD MACHINES. A SHOCK RESISTANT BATTERY MOUNT IS NOT AN ACCEPTABLE SUBSTITUTE FOR THE TYPE OF BATTERY REQUIRED, THOUGH SUCH MOUNT MAY BE FURNISHED IN ADDITION TO THE PROPER BATTERY.

5. ENGINE COOLING SYSTEM

THE TRACTOR SHALL HAVE A HEAVY DUTY RADIATOR WITH THE COOLING SYSTEM PROTECTED TO AT LEAST -20 DEGREES FAHRENHEIT, AND USING A 50%/50% MIXTURE OF A PERMANENT TYPE ANTI-FREEZE AND WATER.

C. FUEL TANK(S)

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. A FUEL GAUGE TO DETERMINE THE FUEL LEVEL SHALL BE FURNISHED.

D. TRANSMISSION

UNLESS OTHERWISE STATED IN THE INVITATION FOR BIDS, THE TRACTOR SHALL BE FURNISHED WITH A POWER SHIFT WITH TORQUE CONVERTER HAVING AT LEAST 3 FORWARD AND 3 REVERSE SPEEDS, OR A HYDROSTATIC TYPE TRANSMISSION WITH INFINITELY VARIABLE FORWARD AND REVERSE SPEEDS UP TO THE MAXIMUM SPEED.

E. STEERING DEVICES AND SERVICE BRAKES

THE MANUFACTURER'S CURRENT STANDARD PRODUCTION STEERING DEVICES AND SERVICE BRAKES SHALL BE ACCEPTABLE.

F. FINAL DRIVE UNITS

THE FINAL DRIVE UNITS SHALL BE IN HOUSINGS ADEQUATELY SEALED AGAINST MUD, DUST, AND WATER. THE FINAL DRIVE GEARS SHALL BE HEAT-TREATED STEEL WITH MACHINE-CUT TEETH. THE DRIVE SPROCKETS SHALL BE REPLACEABLE (BOLT-ON TYPE) WITHOUT REMOVING THE TRACK FRAME.

G. UNDERCARRIAGE

TRACK LINKS, PINS, AND BUSHINGS SHALL BE OF HEAT-TREATED STEEL, REPLACEABLE AND INTERCHANGEABLE. THE MASTER LINK SHALL BE THE SPLIT LINK TYPE. A RECOIL MECHANISM FOR CUSHIONING THE FRONT IDLERS SHALL BE INCLUDED. HYDRAULIC TRACK ADJUSTERS AND SPROCKET GUARDS SHALL BE FURNISHED.

THE TRACK ROLLERS, TOP TRACK CARRIER ROLLERS AND IDLERS SHALL BE LUBRICATED AND PERMANENTLY SEALED. TRACK PINS AND BUSHINGS SHALL BE SEALED AND LUBRICATED.

THE TRACK SHOE WIDTH SHALL BE AS SPECIFIED IN THE INVITATION FOR BIDS. THEY SHALL BE FULL GROUSER TYPE, AND OF HEAT-TREATED STEEL UNLESS OTHERWISE SPECIFIED.

H. HYDRAULIC SYSTEM

THE MANUFACTURER'S STANDARD HYDRAULIC SYSTEM, INCLUDING HEAVY DUTY PUMP, FILTER, TANK, AND CONTROL VALVES SHALL BE ACCEPTABLE. THE TANK SHALL BE EQUIPPED WITH EITHER A SIGHT GAUGE OR DIP STICK TO DETERMINE THE LEVEL OF HYDRAULIC OIL.

I. OPERATOR'S POSITION

THE OPERATOR'S POSITION SHALL HAVE A FULL SUSPENSION, ADJUSTABLE, UPHOLSTERED SEAT, ARMRESTS, BACKREST, AND SAFETY BELT, WITH CONTROLS CONVENIENT TO THE OPERATOR.

J. TOOLS AND LUBRICATING EQUIPMENT

SPECIAL TOOLS FURNISHED AS STANDARD EQUIPMENT WITH THE TRACTOR BY THE MANUFACTURER SHALL BE INCLUDED. A TOOL BOX WITH HASP AND PADLOCK SHALL BE FURNISHED. IF CALLED FOR IN THE INVITATION FOR BIDS, GREASING EQUIPMENT USED TO SERVICE ALL FITTINGS SHALL BE INCLUDED.

K. PAINTING

THE TRACTOR AND ATTACHMENTS SHALL BE PAINTED N. C. DIVISION OF HIGHWAYS YELLOW (MOLINE MPM # 11-Y169A LEADFREE OR EQUIVALENT) OVER A PROHIBITIVE PRIMER.

L. EQUIPMENT

THE FOLLOWING EQUIPMENT SHALL BE FURNISHED:

1. MUFFLER (INCLUDING TURBOCHARGED ENGINES IF MANUFACTURER'S STANDARD ITEM.)
2. MANUFACTURER'S HEAVY DUTY RADIATOR BRUSH GUARD, HEAVY DUTY CRANKCASE AND TRANSMISSION (BOTTOM) GUARD(S).
3. FRONT PULL HOOK.
4. VANDALISM PROTECTION KIT, INCLUDING LOCKING INSTRUMENT PANEL COVER, LOCK TYPE CAPS FOR EXPOSED FILLER CAPS AND OIL DIPSTICK PIPE (LESS PADLOCKS).
5. ENGINE HOOD WITH SIDE DOORS OR SIDE SHIELDS.
6. FRONT AND REAR LIGHTING.
7. FIXED TYPE DRAWBAR. (NOT TO BE FURNISHED IF RIPPER IS ORDERED.)
8. AIR CLEANER SERVICE INDICATOR.
9. DEFLECTOR TYPE EXHAUST PIPE.
10. IN LINE FUEL HEATER LOCATED PRIOR TO FUEL FILTER.
11. RESERVE TURBO CHARGER OILING CAPABILITY TO PROVIDE OILING TURBO CHARGER AFTER ENGINE SHUTDOWN AND DURING INITIAL START-UP.
12. BACK-UP ALARM.

M. INSTRUMENTS AND GAUGES

THE INSTRUMENT PANEL SHALL BE LOCATED IN FULL VIEW OF THE SEATED OPERATOR. THE MANUFACTURER'S STANDARD INSTRUMENTATION SHALL BE FURNISHED, BUT ARE TO INCLUDE THE FOLLOWING AS A MINIMUM: OIL PRESSURE, WATER TEMPERATURE, AMMETER OR VOLTMETER, HOURMETER, FUEL GAUGE, TORQUE CONVERTOR AND/OR TRANSMISSION OIL TEMPERATURE AND TACHOMETER. AUDIO WARNINGS ARE REQUIRED ON INSTRUMENTATION RELATING TO ENGINE OIL PRESSURE AND ENGINE WATER TEMPERATURE.

N. DOZER

UNLESS OTHERWISE SPECIFIED, A COMPLETELY EQUIPPED STRAIGHT BLADE WITH HYDRAULIC TILT, INCLUDING HYDRAULIC CONTROLS, PUSH ARMS, BRACES, TRUNNIONS, REVERSIBLE CUTTING EDGE, AND END BITS SHALL BE FURNISHED.

O. ATTACHMENTS

ATTACHMENTS SHALL BE OF HEAVY DUTY CONSTRUCTION AND AS SPECIFIED IN THE INVITATION FOR BIDS.

1. RIPPER

THE RIPPER SHALL BE EITHER OF THE PARALLEL OR RADIAL TYPE, AS SPECIFIED, AND COMPLETE WITH HYDRAULIC CONTROL VALVES. THE RIPPER SHALL HAVE THE NUMBER OF SHANKS WITH TIPS, AND THE NUMBER OF SHANK POCKETS, AS SPECIFIED. (NOTE: DO NOT FURNISH DRAWBAR IF RIPPER IS ORDERED.)

2. TRACK ROLLER GUARDS

HEAVY DUTY INNER AND OUTER TRACK ROLLER GUARDS FOR FULL COVERAGE OF THE TRACK FRAME.

3. CAB AND ROPS

THE TRACTOR SHALL BE EQUIPPED WITH A CAB AND ROPS UNLESS OTHERWISE SPECIFIED. THE CAB SHALL BE A FULLY ENCLOSED WATERPROOF STEEL CAB WITH INSULATION AND TINTED SAFETY GLASS THROUGHOUT. IT SHALL BE DESIGNED TO GIVE A FULL VIEW OF THE MACHINE OPERATIONS. THE CAB SHALL HAVE AT LEAST ONE DOOR WITH LATCH FOR SECURING IN OPEN POSITION AND WITH KEYED LOCK HANDLE. 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 EQUIPPED WITH A HEAVY DUTY WINDSHIELD WIPER AND WASHER. FURNISH A HEAVY DUTY HEATER AND DEFROSTER.

THE COMBINATION CAB AND ROPS SHALL CONFORM TO SAE J1040 AND BE OF THE SOUND-SUPPRESSION TYPE, AS CURRENTLY OFFERED BY THE MANUFACTURER.

4. ROPS CANOPY

WHEN SPECIFIED A ROPS CANOPY SHALL BE FURNISHED IN LIEU OF A CAB AND ROPS AND IT SHALL CONFORM TO SAE J1040. NO INTERIOR OVERHEAD STRUCTURAL MEMBER SHALL PROTRUDE INTO THE OVERHEAD SPACE SO AS TO CREATE A HAZARD TO THE OPERATOR WHEN STANDING OR SEATED.

5. REVERSIBLE FAN

A REVERSIBLE BLADE FAN SHALL BE FURNISHED IN LIEU OF THE NON-REVERSIBLE TYPE.

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 12 MONTHS FROM THE DATE PLACED 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.

UNDER SAME AND ALL CONDITIONS AS ABOVE, THE POWER TRAIN (ENGINE, TRANSMISSION, TORQUE CONVERTER AND FINAL DRIVE), AND STRUCTURAL MEMBERS SHALL BE COVERED FOR AN ADDITIONAL PERIOD OF AT LEAST 24 MONTHS. ANY PERIODIC INSPECTIONS WHICH NEED BE PERFORMED BY THE CONTRACTOR OR HIS REPRESENTATIVES SHALL BE WITHOUT CHARGE TO THE STATE.

V. SERVICE, PARTS, AND MANUALS

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. THE LOCATION(S) OF SUCH INSTRUCTION SHALL BE AS DESIGNATED IN THE INVITATION FOR BIDS.

OPERATOR'S MANUALS, SHOP MANUALS, COMPLETE PARTS CATALOG BOOKS, AND LINE SETTING DATA SHEETS SHALL BE FURNISHED AS SPECIFIED IN THE INVITATION FOR BIDS.

VI. ACCEPTANCE EVALUATION AND QUALITY ASSURANCE

UPON RECEIPT OF EACH TRACTOR AT THE RECEIVING POINT, THE PURCHASER OR HIS AUTHORIZED REPRESENTATIVE SHALL ARRANGE FOR AN ACCEPTANCE INSPECTION TO DETERMINE COMPLIANCE WITH THIS SPECIFICATION.

THE CONTRACTOR SHALL FURNISH A PILOT MODEL FOR INSPECTION, TESTS AND POSSIBLE MODIFICATION AND/OR ADJUSTMENTS OF ATTACHMENTS IN ACCORDANCE WITH THE INVITATION FOR BIDS. THE SITE OF THE PILOT MODEL INSPECTION WILL BE DESIGNATED IN THE INVITATION FOR BIDS.

VII. DELIVERY AND PAYMENT

DELIVERY OF AND PAYMENT FOR EQUIPMENT FURNISHED UNDER THIS SPECIFICATION SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE INVITATION FOR BIDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PACKAGING, PACKING, OR PROTECTION REQUIRED TO INSURE SAFE DELIVERY IN AN UNDAMAGED CONDITION.

TRACTORS SHALL BE COMPLETELY SERVICED AND READY FOR OPERATION WHEN DELIVERED.

VIII. ORDERING DATA

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. IF CERTIFIED WEIGHT AND DRAWBAR PULL IS REQUIRED WITH BID.
3. TRACK SHOE WIDTH AND TYPE.
4. IF GREASING EQUIPMENT IS TO BE PROVIDED.
5. IF A STRAIGHT BLADE WITH HYDRAULIC TILT IS NOT DESIRED, SPECIFY THE TYPE BLADE TO BE FURNISHED.
6. LIST ATTACHMENTS DESIRED. (SEE ITEM III.O.)
7. IF ROPS CANOPY IS REQUIRED.
8. NUMBER OF SETS OF MANUALS AND BOOKS REQUIRED. (SEE ITEM V.)
9. DESIGNATE LOCATION(S) OF OPERATION AND MAINTENANCE INSTRUCTIONS BY CONTRACTOR'S REPRESENTATIVE.
10. DESIGNATE SITE OF PILOT MODEL INSPECTION.