



Tennessee's Dump Truck Fleet

Maintenance Equipment 2017

Estel Hagewood

July 25, 2017



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History “Down Memory Lane” 25 years !!!



Trailer Specification from 1993!!!



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0346

July 19, 1993

Mr. Woody Delbridge
Mechanical Engineer, Sr. - D.O.T.
1401 East Broad St.
Richmond, Virginia 23219

Dear Woody:

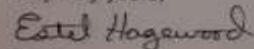
During the recent Southeastern States Equipment Managers Meeting, we discussed the problem of trailers being bid by "welding shops" and the problem of not receiving quality, major manufacturers products.

We have had numerous problems of late delivery, warranty claims, and quality workmanship. Approximately three years ago we added the requirement to our trailer specifications of Manufacturer Certification of Liability Insurance - \$2,000,000.00 (see attachment #1). The State of Tennessee Purchasing Department will bypass bidders that do not conform to this specification, thus DOT receives a major brand of trailer which is protected by a \$2,000,000.00 liability insurance. During this time of increasing public pressure from lawsuits against the state, this insurance is definitely justifiable.

I have also attached a new term we developed last year after a protest which required DOT to further define "latest design in current production" (see attachment #2). This new term is used on all of our off-road equipment which does not allow any modification. Because some "vendors" define "latest design in current production" as any design change which is currently coming down their assembly line.

If I can be of any help or you need additional information, please contact me at (615) 741-0699.

Very truly yours,



Estel Hagewood
Tennessee Dept. of Transportation

/bc

attachments



HEADQUARTERS MAINTENANCE

Estel Hagewood
Transportation Manager 2
Field Operation Support & Fleet
Management
615.532.3462
Estel.hagewood@tn.gov

Ken Hampton
Transportation Manager 1
615.741.3458
Ken.hampton@tn.gov

Henry Stephens
Fleet Supervisor 2
615.532.3825
Henry.stephens@tn.gov

Terry Farley
Administrative Services Assistant 3
615.532.3827
Terry.farley@tn.gov

- **One Vacant Position**
- **Materials, Equipment (Procurement & Rental) & Service Contracts-\$150 M**
- ***TDOT "Equipment Committee"***
- **TDOT "Strike Force"**
- **TDOT "Equipment Operator Training"**
- **TDOT "Snow & Ice Coordination"**
- **TDOT "Policy and Procedures"**
- **TDOT "Vegetation Management Committee"**
- **TDOT "Contract Committee"**

Tennessee Highway System

Total Public Roads

Centerline Miles

95,523 mi

Public Bridges

19,740

Total State Roads

Centerline Miles 13,884

Lane miles 37,447

State Bridges 8,291

Interstate Miles 1,104



4 Traffic Management Centers - 14 Welcome Centers - 18 Rest Areas - 10 Truck Weigh Stations



Tennessee Highway System

The logo for "TNFORWARD" features a stylized road leading to a red star, with a circular emblem containing three stars in the background.
TNFORWARD

TOP **TO** BOTTOM
REVIEW

TDOT Size & Organization

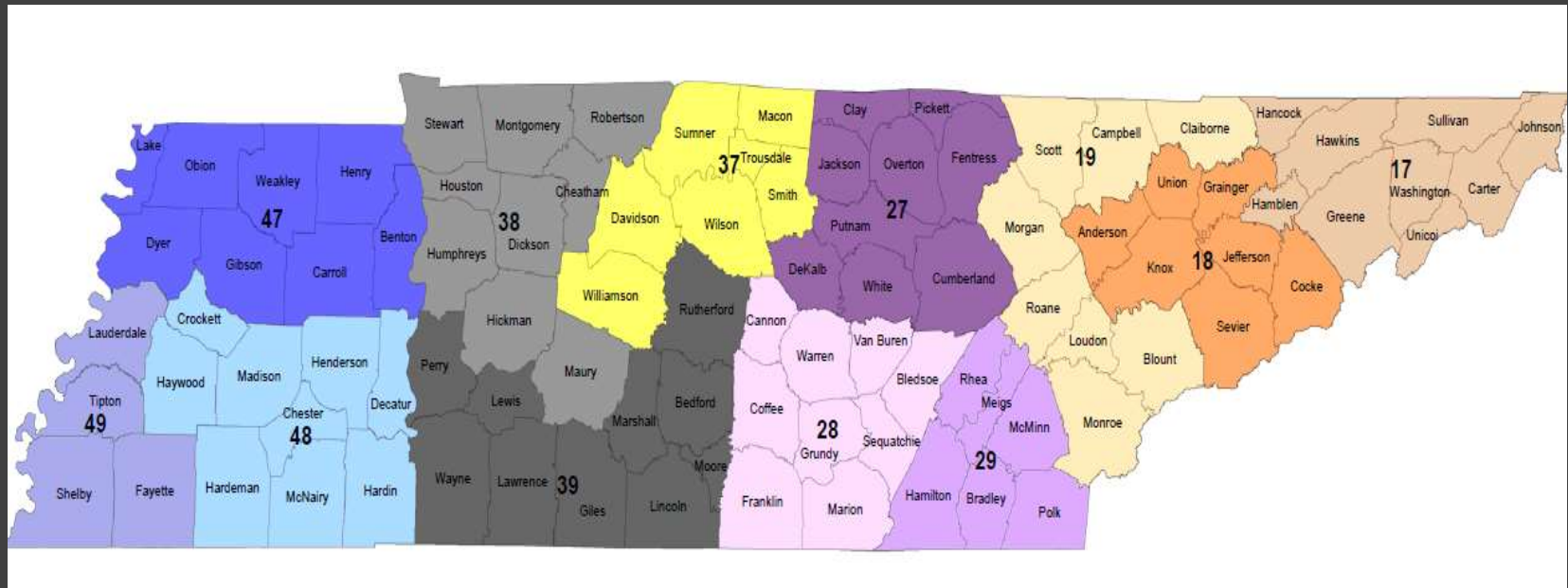
4 Regions

3,900 Employees

12 Districts

1,400 Field Operations

95 Counties



WINTER STORMS-ARE WE READY?

TENNESSEE CROSSROADS FOR INDUSTRY IN THE SOUTH



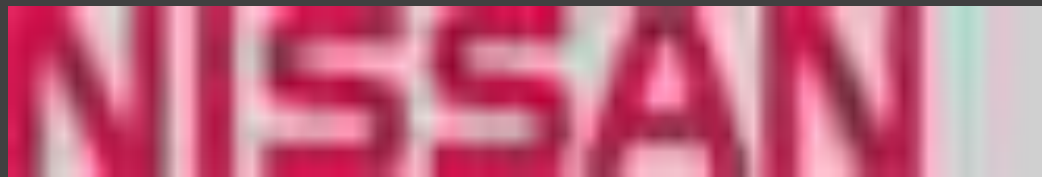
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No, we weren't ready!!!



MANUFACTURING COMMERCE AND TRANSPORTATION NEEDS FOR THE COUNTRY CHOSE TENNESSEE

VOLKSWAGEN



FedEx.

Join us as we help those affected by the hurricanes.

[Learn more about how FedEx is helping >>](#)

DELL™

 **BERETTA**

 **HANKOOK**

amazon




Welcome to UPS

GM

Dump Truck Problems- 2013 Summary

- At 2013 replacement expenditures by the year 2021 TDOT would have 452 dump trucks 15-25 years old (over 50%)
- Replacement parts getting very difficult to find
- Safety had become a major concern
- The older dump trucks were in extremely poor condition and the ROI to refurbish was not cost productive
- In 2013 we had 235 dump trucks or approximately 23% 20-25 years and older
- Turn in criteria = 250,000 miles (no age limit criteria)

2014 EQUIPMENT BUDGET “OVERHAUL”

- 2014 Mobile Equipment Budget \$17M (all equipment and fleet vehicles—cars, pickups, etc)
- Dump truck designed for any job: snow & ice, paving, boulders, shot rock, slides, sinkholes, strike force “compatibility”, safety
- Dump Truck Replacement Goal – 10 year replacement cycle and **not** replace any major components: **Dump Bed**, engine, transmission.
- 2015 Mobile Equipment Budget increased to \$30M with **\$17M per year for the next four years dedicated to Dump Trucks.**
- IMPROVING!!! 2017 - oldest dump trucks is 2005 (12 years old)



DUMP TRUCK SUMMARY

DUMP TRUCKS PURCHASED BY FISCAL YEAR							
		2015		2016		2017	
LT. DUTY TANDEM (KENWORTH)		54		54		66	
HD TANDEM (MACK)		28		28		32	
QUAD AXLES (MACK)		6		6		10	
REGIONAL TOTALS		88		88		108	284

Winter Maintenance Operations - "STANDARD OPERATING GUIDELINES" for 2015

- **Prioritizing Routes:**
- **Priority 1:** All urban interstates, high ADT routes and designated one lane routes shall be considered priority 1 routes and figured at an average 30 lane miles per truck, see attachment "P".
- **Priority 2:** All Counties with rural interstate or without interstate shall have priority 2 routes figured at 45 lane miles per Truck and all remaining routes shall be considered priority 3.
- **Priority 3:** All remaining routes that are not classified as priority 1 or 2 lane miles per employee will vary. All snow and ice plans shall be submitted by the Regions in the same excel format each year. See attachment "A".

Statewide Totals

Salt Trucks: 791

Salt (tons): 212,121

Salt Brine (gallons): 2,087,206

Salt Bins: 133



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Does this design look familiar?
Evaluate options





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2006 International Truck OK, Body- "NO"



Same International 2006 Body



2009 International (8 years old)





Equipment Committee

REGIONAL:

Doug Tarwater, Region 1
Eric Wolfenbarger, Region 1
Flint Frame, Region 2
John Reagan, Region 2
Lee Bogle, Region 3
Jason Hicklen, Region 3
Ricky Hall, Region 4
Mike Hicks, Region 4
John Thomas, Region 4

Headquarters Maintenance

Estel Hagewood,
Ken Hampton,
Henry Stephens

MANAGERIAL SUPPORT:

Regional Operations Engineers:

Ben Price, Region 1

Gwendolyn Whitaker, Region 2

Shay Deason, Region 3

Ross Sherwood, Region 4

Central Services:

Bob Alwine

Robert Taylor



TDOT Equipment Committee Titles – 18 Members, meet approx. 6 times a year

District Engineers, District Managers, District Supervisors, County Supervisors, Regional Managers, District Shop Foreman, Regional Shop Foreman, Procurement Director, Procurement Officer, Maintenance Managers, Fleet Supervisors.

“United we stand divided we fall”

Dump Trucks

- Developed SWC 200
- Heavy Trucks & Trailers 7/1/2015- 5/31/18
- 1 1/2 Years to finalize this specification
- Success due to the research, commitment and support of the TDOT Equipment Committee

Dump Trucks

Three sizes

- A) Light Duty Tandem
- B) Heavy Duty Tandem
- C) Quad Axle

NO SINGLE AXLE DUMP TRUCKS ON CURRENT
STATEWIDE CONTRACT

Equipment Committee made decision to not purchase any Single Axle Dump truck for next 3 years and purchase tandem dump trucks instead.

Heavy Duty/Light Duty Tandem



Light Duty Tandem/Single Axle

- SAME CHASSIS MODEL, ENGINE, AND TRANSMISSION AS OUR OLD SINGLE AXLE SPEC - Increased body length from 10 ft. to 13 ft. (12 cu. yd.)
- Added extra pulling axle & rear locking differential
- Added 9 ft. underbody scraper (replacing grader cost and replacing experienced grader operator)
- Includes 13 ft. V box stainless steel spreader w/galvanized stands 7.62 cubic yard. (with dual auger no chains)
- Includes snowplow hitch frame (no plow)
- Cost \$182,765.00 KENWORTH (ALUMINUM CAB)

LIGHT DUTY TANDEM



Light Duty Dump Truck

- Engine: 543 cu.in. minimum with a torque rise of 65%
Inline 6 cylinder, wet sleeve 330 HP minimum, 1000
lb-ft Torque minimum @ mfr. rated RPM, Bio Fuel B20
Capable Three position (High-medium-off)
Compression Brake Required
- Frame: RBM 2,132,000 (Single Frame Required)
- Transmission Allison 3500 RDS (Low gear capability)
6 speed
- Trailer air brakes, removable hitch, paver setup
- Aluminum air tanks & aluminum battery boxes
- Road Temperature System (Road watch)

Heavy Duty Tandem



Heavy Duty Tandem

Engine: 780 cu. in. minimum, 455 HP minimum w/1,650 lb-ft torque minimum, compression brake required

Manual transmission 10 speed (8LL)

Suspension: Front 20,000 lbs., Rear 46,000 lbs. Hendrickson walking beam or Mack mRide46

Rear Axle: Double reduction rear axle

Brakes: Disk brakes on Front and Rear axles

Frame: RBM 3,160,000 in. –lbs. (Single Frame Preferred)

Aluminum air tanks & stainless steel battery boxes

Trailer air brakes, removable hitch paver setup

HEAVY DUTY TANDEM

- Same chassis model, engine, and transmission as Quad Axle
- Body length from 15 ft. (17.25 cu. yd.)
- Extra towing power & rear locking differential
- Added 10 ft. underbody scraper (replacing grader cost and replacing experienced grader operator)
- Includes 15 ft. (8.81 cy. Yd.) V box stainless steel spreader w/galvanized stands cubic yard. (with dual auger no chains)
- Includes snowplow hitch frame (no plow)
- Road Temperature System (Road watch)
- Cost \$211,087.00

QUAD AXLE DUMP



QUAD DUMP



QUAD MACK STANDARD HIGH LIFT





QUAD AXLE DUMP

Engine: 780 cu. in. minimum, 455 HP minimum w/1,650 lb-ft torque minimum, compression brake required

Manual transmission 10 speed (8LL)

Suspension: Front 20,000 lbs., Rear 46,000 lbs. Hendrickson walking beam or Mack mRide46

Rear Axle: Double reduction rear axle

Brakes: Disk brakes on Front and Rear axles

Frame: RBM 4,260,000 in. lbs.

Aluminum air tanks

Trailer air brakes, removable hitch paver setup

Two steerable air pusher axles 13,200 255/70R 22.5

QUAD AXLE DUMP

- Same chassis model, engine, and transmission as Quad Axle
- Body length from 19.5 ft. (22 cu. yd.)
- Includes 19 ft. (15.20 cy. Yd.) Vbox stainless steel spreader w/galvanized stands cubic yard. (with dual auger no chains)
- Includes snowplow hitch frame (no plow)
- Road Temperature System (Road watch)
- Cost \$238,046.00

DUMP BODY MATERIAL SPECIFICATIONS

- MAIN LONG SILLS $\frac{1}{4}$ " 201 STAINLESS
- FLOOR, TAILGATE, SIDES $\frac{1}{4}$ " AR-450
- FORMED TOP RAIL $\frac{3}{16}$ " DOMEX
- TAILGATE TOP BRACE $\frac{3}{16}$ " DOMEX
- CAB SHIELD $\frac{3}{16}$ " DOMEX
OR 201 STAINLESS

BALANCE OF COMPONENTS CONSTRUCTED
USING $\frac{3}{16}$ " DOMEX OR 201 STAINLESS.

Dump Body Material Specifications

- THE ENTIRE LOAD SPACE INCLUDING THE FLOOR, TAILGATE, SIDES AND FRONT SHEET IS TO BE CONSTRUCTED USING ¼ INCH AR-450 STEEL PLATE WITH MINIMUM YIELD STRENGTH OF 175,000 PSI AND TENSILE STRENGTH OF 205,000 PSI.
- ***“OLD SPECS WERE 50,000 PSI STEEL”***
- BOTTOM SIDE RUB RAILS, TAILGATE BOX BRACING (EXCEPT FOR TOP RAIL) AND REAR CORNER POSTS ARE TO BE CONSTRUCTED USING 3/16 INCH NON MAGNETIC 201 ALLOW STAINLESS STEEL.
- To strengthen and eliminate potential rust- ALL WELDS SHALL BE CONTINUOUS AND ALL BOXED AREAS SHALL BE SEALED AND MUST HAVE DRAIN HOLES AT LOWEST POINT POSSIBLE TO ALLOW FOR CONDENSATION TO EXIT.

Dump Body Summary continued

- Pintle Hitch (TDOT design) 4 inch removable (for paving) 45 ton capacity with 9 ton vertical load. Includes trailer lights (1" seven pin round, 1" 7 pin flat), including 1 four pin round brine tank. Also includes two Attenuator Brackets.
- Snow Plow hitch frame- Frame mounted required, fold down self storage

4" RECEIVER HITCH



REMOVING HITCH



STORAGE PASSENGER SIDE ON FRAME





CAB PROTECTOR

THE CAB SHIELD EXTENDS 24" FORWARD OF THE BODY HEAD SHEET AND CONSTRUCTED WITH 3/16" DOMEX OR 201 STAINLESS STEEL. SIDE GUSSETS ARE TO INCLUDE MOUNTING SURFACE FOR TARP SYSTEM INSTALLATION. CAB PROTECTOR IS TO BE CONTINUOUSLY WELDED TO HEAD SHEET.





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HEAD SHEET

HEAD SHEET CONSTRUCTED OF ¼" AR-450. HEAD SHEET TO BE BRACED WITH A TOP BOX BRACE USING 3/16" DOMEX AND SINGLE PIECE HORIZONTAL BOX BRACE USING 3/16" DOMEX



ONE PIECE FLOOR ¼" AR 450

FLOOR IS FABRICATED FROM SINGLE SHEET OF ¼" AR-450. SPLICES IN FLOOR ARE NOT ACCEPTABLE. FLOOR PLATE IS FORMED WITH A FLANGE ON EACH SIDE AND CONTINUOUSLY WELDED TO EACH BODY SIDE SHEET AND BODY HEAD SHEET.



Dump Body Top Rail (NO BOARD POCKETS, ELIMINATE RUST POTENTIAL)



Tailgate “D-Ring”

A HINGED “D-RING” SHALL BE MOUNTED TOP AND CENTER OF TAILGATE TO PROVIDE LIFTING HOOK FOR REMOVING TAILGATE



LONG SILLS DESIGN TRAPEZOIDAL OR I BEAMS “NO CROSSMEMBERS”

FABRICATED FROM ¼” STAINLESS

SINGLE PIECE LONG SILL WITH 3/16”
INTERNAL REINFORCEMENTS



HOIST (NO HOIST WELL ELIMINATE RUST POTENTIAL, INCREASE CAPACITY)



TOP HINGE PIN

THE TOP HINGE PIN SHALL BE MINIMUM 1 ¼" DIAMETER AND PIVOT THROUGH TWO ½" THICK PLATES WELDED TO TOP OF THE CORNER POSTS. PINS SHALL BE TAPERED TO EASE INSTALLTION. DESIGN INCLUDES KEEPER CHAINS TO PREVENT LOSS OF PINS.



TAILGATE

THE OUTER, LOWER AND TWO INTERMEDIATE BOX BRACES ARE FORMED WITH 3/16" NON-MAGNETIC 201 STAINLESS STEEL. BRACES ARE CONTINUOUSLY WELDED.



TAILGATE LATCH SYSTEM

TAILGATE LATCH CROSS SHAFT SHALL BE SUPPORTED ON EACH END BY BUSHINGS. A MANUAL OVERRIDE SHALL BE PROVIDED ON THE OUTSIDE OF THE DUMP BODY.





FOLD UP STEPS

A FOLD UP FIVE-RUNG LADDER SHALL BE INSTALLED ON CURB SIDE OF DUMP BODY



WIRING AND HOSE ROUTING

WIRING AND HOSES GOING TO FRONT OF DUMP BODY TO BE SECURED TO ½" DIAMETER PAINTED STEEL ROD STAND-OFF'S WHICH WILL BE SPACED NO MORE THAN 24" APART



CORNER POST LIGHTS

EACH REAR CORNER POST SHALL CONTAIN ONE REAR FACING AND ONE SIDE FACING LED AMBER WARNING LIGHT. ONE LED BACK UP LAMP. ONE LED STOP, TURN, TAIL LAMP INSTALLED IN THE STAINLESS STEEL ENCLOSURE AND MUST BE DESIGNED FOR ACCOMODATING THE SNOW-AWAY HEATED LENS SYSTEM.



CAB SHIELD CORNER LIGHTS

CAB SHIELD SHALL HAVE FRONT FACING AMBER WHELEN 400 V/TIR SERIES LIGHTS IN EACH OUTER 45 DEGREE FRONT CORNER MOUNTED IN STAINLESS STEEL ENCLOSURE



CAB SHIELD REAR LIGHTS

THE CAB SHIELD SHALL HAVE TWO REAR FACING AMBER STROBE LIGHTS MOUNTED AS FAR OUTWARD AS POSSIBLE AND MOUNTED ON A STAINLESS STEEL STAND SO AS TO BE VISIBLE WHEN V-BOX SPREADER IS INSTALLED.



PAINT PREPARATION SPECIFICATION

- ALL MANUFACTURED FERROUS EQUIPMENT ATTACHED TO THE CHASSIS SHALL HAVE ALL OIL, GREASE, DIRT, ETC. REMOVED PRIOR TO BLASTING.
- ALL SHARP EDGES AND CORNERS SHALL BE GROUND SMOOTH.
- ALL DUMP BODY SURFACES ARE TO BE ABRADED BY SAND/MEDIA BLASTING.

PAINT GENERAL SPECS

- FINISH SHALL BE SMOOTH, SHINY AND FREE OF RUNS, OVERSPRAY AND/OR OTHER DEFECTS.
- NO BARE FERROUS METAL COMPONENTS SHALL BE VISIBLE ON THE CHASSIS, OR ANY OEM OR BODY BUILDER INSTALLED COMPONENTS.

PRIMER/PAINT MATERIALS

- PRIMER-ZINC/EPOXY ... MINIMUM OF 3000 HOURS IN A SAE B-117 SALT SPRAY ; TOP COAT SHALL BE CERTIFIED FOR 1000 HOURS FOR THE SAME TEST. TOP COAT SHALL BE APPLIED AT A MINIMUM 2-4 MILS DRY FOR LIQUID PAINT...COMBINED PAINT SYSTEM SHALL PASS AN SAE B-117 ACCERLATED SALT SPRAY TEST FOR NO LESS THAN 4000 HOURS. *** OR *** EPOXY PRIMER PPG AMERON ...2-3 MIL WITH TOP COAT PPG POLYSILOXANE 4-6 MIL COMBINED PAINT SYSTEM OF 6-9 MIL

Dump Body Research - Tub





DUMP BODY RESEARCH (DESIGN & MATERIAL)

Conventional Body bracing and reinforcements used in their “post type designs”, can increase the body to corrode starting on all inside braces due to condensation. Bodies can rust from the inside out and on the outside, thus greatly decreasing the life cycle of the dump body.

Corten Steel is used on bridge decks and we seriously considered this option, but corten steel did not any advantage of tensile strength. Corten similar strength to high tensile steel.

DUMP BODY RESEARCH – MATERIAL

Various materials and suppliers will vary data listed below

Aluminum	33,000 psi yield strength,	46,000 psi tensile strength
Hi-tensile steel	50,000 psi yield strength,	70,000 psi tensile strength
Hi-tensile steel	65,000 psi yield strength,	80,000 psi tensile strength
Corten (weathering)	50,000 psi yield strength,	70,000 psi tensile strength
201 stainless	38,000 psi yield strength ,	75,000 psi tensile strength
304 stainless	30,000 psi yield strength,	75,000 psi tensile strength
Domex	100,000 psi yield strength,	110,000-130,000 psi tensile strength
<u>AR 450</u>	<u>175,000 psi yield strength,</u>	<u>205,000 psi tensile strength</u>

DUMP BODY FEATURES

Hydraulic valves & tank-Dump bed interior



HYDRAULIC CONTROLS IN CAB TODAY

PAST



FORCE America 5100 EX



Touch pads correspond to the view on the screen

Blue knob adjusts the spinner speed by rotating it. It also activates blast by pushing it.

Pushing the Green knob changes from Standby (spreader off) to spreader on. Turning the knob adjusts the rate of application.

The 5100EX screen is a touch screen used for selecting Menu items, making selections on sub menus and adjusting values on sub menus.



ON DEMAND HYDRAULIC PUMP



Load Sense Piston Pump

FA3201 Severe Duty Pump

FORCE America model FA3201 variable volume load sense piston pumps are specifically designed for severe duty applications.

- **High Flow Rates**
 - + 34-45 GPM (at 1800 RPM)
 - + 2800 RPM maximum speed
- **High Pressure**
 - + Intermittent pressure to 4000 PSI on FA3204
 - + 3000 PSI on FA3205
- **Severe Duty High Pressure (2000 PSI) Outboard Teflon Shaft Seal**
 - + Protects pump shaft bearing and seal from external contamination and salt water
- **Special Hardening Process on All Wear Surfaces**
- **Steel Piston Shoes**
 - + Proven rotating group design
- **O-Ring Housing Seals**
 - + No gaskets



1-888-99FORCE

www.forceamerica.com

Closed Loop Spreader System



V-Box Spreader



SPREADER – DUAL AUGER



REMOVE SPINNER



V BOX REMOVAL WITH HIGH LIFT TAILGATE OPERATION



V BOX



SPREADER REMOVED



QUICK COUPLER OPERATION



SPREADER QUICK COUPLERS



HYDRAULIC QUICK COUPLERS



SNOWPLOW POWER ANGLE QUICK COUPLERS



UNDERBODY SCRAPER QUICK COUPLERS





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“TESTED” SINGLE AXLE SPRING TOOTH



UNDERBODY SCRAPER



UNDERBODY SCRAPER DOWN POSITION- KW 1,555 LBS/FT DOWN PRESSURE COMPARED TO FRONT PLOW 133 LBS/FT

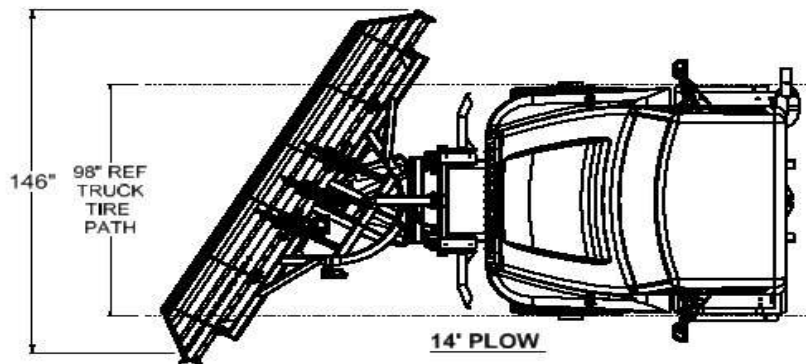
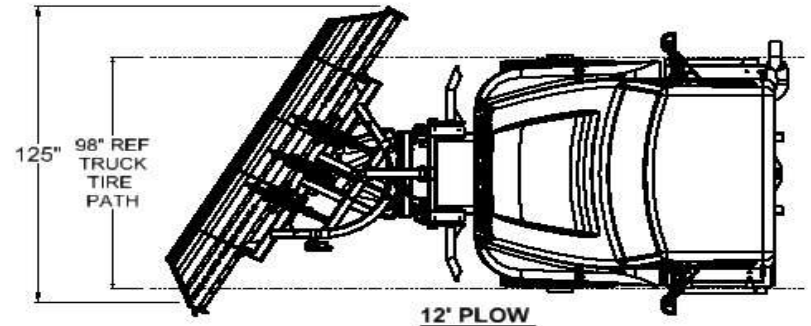
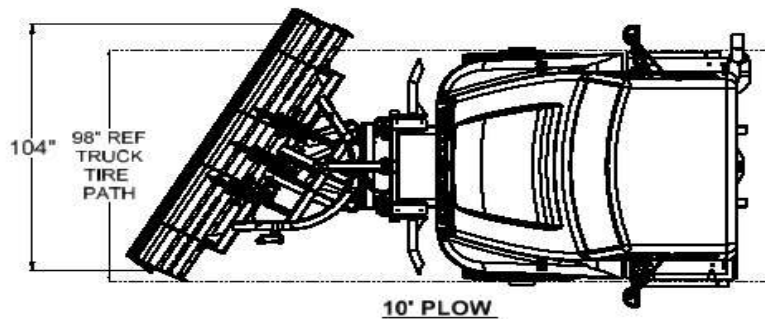


SNOW PLOWS

VIKING CIVES
MIDWEST

2280 HWY 81, MOOREVILLE, MO 63767, PH: 573.262.3943, FX: 573.262.3988

**30R PLOW WITH REVERSIBLE PUSHFRAME
AND KUEPER GK5 BLADES:
CLEARING PATHS (FULLY ROTATED)**



THIS DRAWING SET IS INTENDED TO BE USED AS A GENERAL GUIDE ONLY. DIMENSIONS MAY VARY. ALWAYS REFER TO THE SPECIFICATIONS AND DRAWINGS FOR THE EXACT DIMENSIONS AND REQUIREMENTS. © 2014 VIKING CIVES MIDWEST. ALL RIGHTS RESERVED.

TRUCK MOUNTED ATTENUATORS



SERVICE

- TDOT EQUIPMENT COMMITTEE
“RAISED THE BAR ON SERVICE”
- VENDOR HAD TO STEP UP “OR”
DISQUALIFY BID DUE TO NON-
COMPLIANCE OF SPECIFICATIONS.
- CREATED A LOT OF CONSERVATION



SERVICE TERM IN TRUCK SPECS

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of F.O.B. delivery location. The supplier of the hydraulic and spreader control system is required to have a minimum of **two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee.** Each associate must have a minimum of four (4) years working experience in the fluid power industry. **They must also have completed certification training of the systems being provided to the state of Tennessee which includes a minimum of 80 hours of manufacturer training classroom/hands on simulation training on ground speed controllers, hydraulic pumps, valves, and all hydraulic components that are in this bid document.** The two associates will provide statewide training as described in section "7", page 12, and they shall also provide troubleshooting and warranty repairs for the hydraulic and salt spreader control system currently being bid. Manufacturer Component certification of these associates will be required prior to award of this contract.



BID REQUIREMENTS

Failure to provide the associates located in Tennessee and Manufacturer Component Certification will be considered failure to meet specifications and will result in un-award of contract. (Note: Manufacture certification as just an installer is not acceptable, troubleshooting, repairs, training capability and experience are required for; ground speed controllers, hydraulic pumps, valves, and all hydraulic components that are in this bid document). Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians. A list of three (3) satisfied customers using dump bodies of the size bid or larger with central hydraulic systems, controls and valves for hydraulically operating snowplow up/down, angle right/left, tailgate spreader on/off, hoist up/down including pump and hoses such as used by the same customers for snow removal which have been installed and serviced by the manufacturer's franchised authorized service dealer listed below is required. List of customers must include franchise brand bid and model number of equipment.



TRAINING TIMELINE

Annual training shall be provided for each model year vehicle that is purchased from this contract, covering all areas of the complete truck. Training will only be conducted at locations that receive a vehicle.

Training will include classroom & hands-on instruction on all features, accessories, and functions of the truck including body, hydraulics, spreaders and ground speed controllers.



TRAINING - OPERATOR

Cab & chassis training shall be conducted at each district headquarter facility (12 each maximum). Body builder installed component training shall be conducted at each sub-district facility (22 each maximum).

Operator training for the cab and chassis shall last approximately 3.5 hours and shall include at a minimum the proper operation of all standard and optional manufacturer/dealer installed items to include explanation of all warning lights and buzzers, location of all fluid check points, proper method of checking all fluid levels and the proper exhaust regeneration procedures.

Operator training for the body builder components shall last approximately 3.5 hours and shall include at a minimum the proper operation of all body builder installed components to include snow plows, spreaders, hydraulic systems, bed system and all safety lights.

Cab and chassis training shall not be combined in the same 3.5 hours as the body builder installed components.

All operators shall receive a step by step laminated copy of the operation of the spreader control system.

Trainers shall provide a minimum of ten (10) ground speed controllers or simulators of the exact model installed in the trucks for hands-on classroom training.

Trainers shall include a step by step power point presentation of the operation of the ground speed controller system



TRAINING - MECHANIC

Mechanics

1. Vendor-Supplied Training - The Vendor shall provide training for the listed critical areas. Each training session (cab /chassis and the body builder installed component) for mechanics shall last no less than 3.5 hours. Cab/chassis and body builder training shall not be combined in the same session. This training shall consist of the same training as is provided to technicians employed by dealerships who maintain these components, with the following exceptions:

Course content shall be tailored to meet the specific needs of TDOT mechanics, and shall not place emphasis on areas or components not specified in these specifications. Course shall also include as much hands-on content as needed to reinforce lecture content.

- The Vendor shall provide telephone numbers and name of contact person/persons for technical assistance to TDOT mechanics on all major components on the completed truck. **Contact person/persons for body builder installed components and the ground speed controller/hydraulic system shall be available 24 hours a day, October 1st through April 30th.**
- Mechanic cab and chassis training shall be conducted at each district headquarter facility (12 each maximum). Body builder installed component training shall be conducted at each sub-district facility (22 each maximum).
- All mechanics shall receive a step by step laminated copy of the operation of the spreader control system.
- All mechanics shall receive a step by step trouble shooting laminated copy of the spreader control/hydraulic system
- Calibration training of the ground speed control system shall be hands on training with a step by step list of the calibration process for both granular and pre-wet systems.

Trainers shall provide a minimum of ten (10) ground speed controllers/simulators of the exact model installed in the trucks for operator, mechanic and calibration

TRAINING COMPONENTS

Cab and Chassis Systems

- i. Operation of all standard and optional supplied equipment.
- ii. Proper lubrication and fluid inspection to include types of fluids, inspection points and filter locations.
- iii. Proper preventative maintenance procedures.
- iv. Location of all fuse boxes, circuit breakers and all electrical/control modules ie: TCMs, ECMs, ABS modules etc. and any maintenance/preventative maintenance for these items.
- v. The meaning of all SES/system malfunction lights, proper procedures when illuminated and any resets allowed.
- vi. Proper brake inspection and maintenance.
- vii. Proper regeneration procedures of exhaust systems.

Body Builder-Installed Components

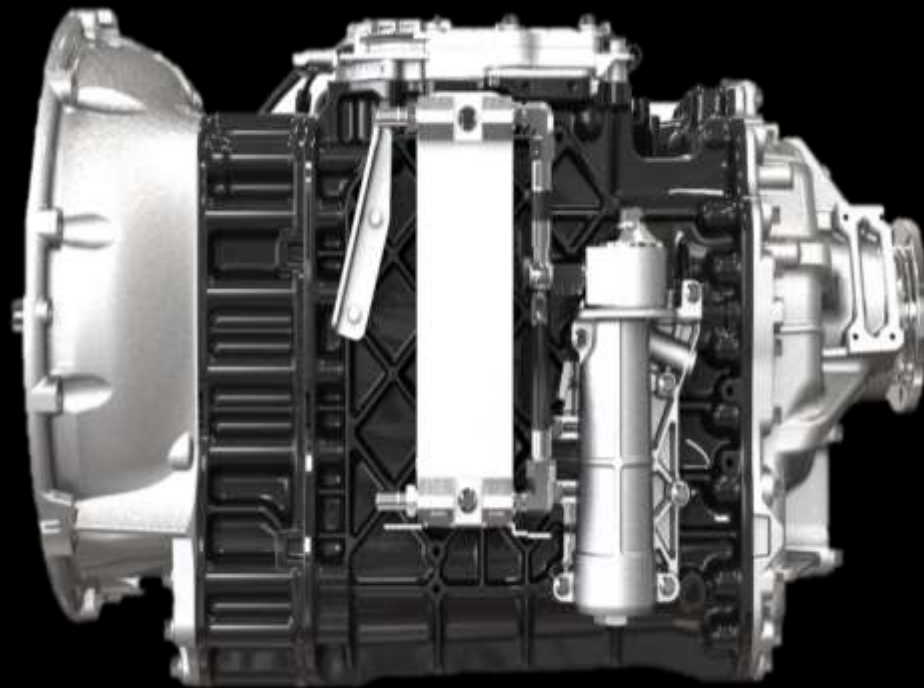
- I. Hydraulic system operation, diagnostics and repair.
- II. Electrical accessories operation, circuits, diagnostics and repair.
- III. Spreader control system operation, diagnostics and repair.
- IV. Warning light system operation, diagnostics and repair
- V. Ground speed system
- VI. Calibration of granular and pre-wet systems



25 TON TAG TRAILERS WITH DUMP TRUCK



mDRIVE™ HD
A TRUE GAME
CHANGER





***m*drive™**

Transmission Comparison: *m*DRIVE™, Eaton Ultrashift PLUS, Allison RDS



Cost Comparison

mDRIVE™ HD

Compared to the Competition:

- *mDRIVE* HD, PTO ready -
\$2,215.00
- Allison 4500 RDS, PTO ready –
- 13,092

AUTOMATED MANUAL OPERATION

mDRIVE[™] Makes the driver's Job easier....
Simply push the button and drive.





HIGH LIFT TAILGATE

COST:

Quad Axle Standard

Light Duty Tandem Option \$3,473

Heavy Duty Tandem Option \$3,473

Advantages

- 1) Able to dump larger mass loads, ie boulders and root balls.
- 2) Ability to load and unload V-Boxes and sprayers without removing tailgate.





Link-Belt

Five Rivers
MASSAGE

Airport Complex



IDOT

STAY BACK 200 FEET

Vulcan-Dies



EXIT 387
Convention Center
Museum of Art
Knoxville College

56 WI65

Any Questions?





TN.GOV
TENNESSEE GOVERNMENT

