Flatbed & Water Tank
Design for M1008
and Commercial Pickups

National Association of State Foresters
in Cooperation with
Michigan’s Forest Fire Experiment Station
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Disclaimer

This report has been developed for the guidance of member States, Provinces, Federal Agencies and their cooperators. The National Association of State Foresters and the State of Michigan assume no responsibility for the interpretation or use of this information.

The use of trade, firm or corporation names is for the information and convenience of the user. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement or approval of any product or service to the exclusion of others, which may be suitable.
Introduction

The M1008 is the military version of General Motors 1980’s pickup trucks. Rated at 5/4 Ton payload capacity, the M1008 is part of the military’s commercial utility cargo vehicle (CUCV) family. This project converts an M1008 to a flatbed truck by removing the cargo box and fabricating a steel bed. The design can also be used with GM civilian trucks of that vintage. With minor changes, it can be used with virtually any standard size, 8 foot bed pickup. The flatbed offers three advantages over the cargo box.

- More area is available to mount fire equipment.
- The bed is more durable than the cargo box. When off road, it can better withstand brushes with objects such as trees.
- The sides are lower, making access easier.

The layout and photos show this concept with a 175 gallon polypropylene tank mounted to the bed. This tank was designed specifically for this application. The tank is wider than a typical pickup slip-on tank unit. This allowed a reduced height, making the top mounted hose reel easier to reach. It also allows the tank length to remain relatively short so that a pump and foam proportioner will fit at the back of the bed. The tank’s water capacity was matched to the truck load capacity. Fully outfitted minus storage items, this unit weights about 88 percent of its Gross Vehicle Weight Rating (GVWR). This allows for adequate storage weight plus a cushion to reduce the possibility of operating overweight.

Appendix A lists some slip-on tank references and custom tank sources. Appendix B details specifications for purchasing the polypropylene tank. Custom building of “poly” tanks can be done by manufacturers at a reasonable price. Plastic sheet is normally cut by computer controlled cutters. Because there are no special molds and part of the fabrication is automated, there is less advantage to mass production. The cost of the tank for this project should be about $1,200. The model of pump and its placement will dictate the location of tank ports. Make sure their locations are specified properly.

This is not a true slip-on unit. The tank, pump, and most other appliances are mounted directly to the bed. They cannot be slipped off/on as one unit. Most of the accessories are available for purchase. The draft hose storage tubes are an exception. They are mounted by fabricated brackets and made of PVC pipe. A step and rocker panel guard (“Nerf” bar) was added under the cab. These bolt to the frame and provide a step and some protection to the cab’s rocker panel. Trailer hitch, tow point, and tail light receptacles are incorporated into the rear panel of the bed.

Data Summary

REC “Flatbed” Slip-on M1008

Weight of vehicle, including pump, proportioner, tank, reel, and storage trunk without stored items.

<table>
<thead>
<tr>
<th>Weight Rating</th>
<th>w/o Water</th>
<th>w/ Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front Axle</td>
<td>3,800</td>
<td>3,405</td>
</tr>
<tr>
<td>Rear Axle</td>
<td>5,600</td>
<td>3,445</td>
</tr>
<tr>
<td>Total Vehicle</td>
<td>9,400</td>
<td>6,850</td>
</tr>
</tbody>
</table>

Wheelbase - 131.5 inches
Water Tank Capacity - 175 gallons
Water Tank Material - Polypropylene
Flatbed Material - Steel
Photos

The finished M1008 product with accessories that REC used.

The M1008 has an outside the frame fuel tank which should be guarded.
Fabricating the Flatbed

The final weight of the steel bed is just over 700 pounds. The overall dimensions will be about 8 feet x 6-1/2 feet. You will need to prepare an area large enough to build and turn over a structure of this size and weight.

The welding can be done with either stick electrode or wire-feed. The later will be faster. Most parts can be cut with a metal capable bandsaw. Plasma cutting is the easiest way to cut the large sheet steel openings. An alternative for those who do not have a plasma cutter or large shear is to have a steel warehouse prepare the parts. Most have the equipment to do this efficiently. The extra fee may be well worth it.

**NOTE:** The holes drilled in the deck plate were made to accommodate specific accessories. Pattern, size, and quantity, will depend on specific equipment used.

The drawings call for welding the steel tube framework then adding the deck to the framework. The location of holes in deck will depend on the fire appliances used.

Attaching the Bed to the Truck Frame

The bed is attached by two bolts located at the rear of each frame rail and two rubber cushioned points in the front. Section A-A of Drawing 29-9817 shows the rear mount. This is a direct mount with a hole drilled in each frame rail and a 3/4 inch bolt, nut, and washer tightened to form the attachment.

The “cushioned” points use two of the elastomer mounts from the removed cargo box. These elastomer mounts are shown as Item 24 on the Assembly Drawing 29-9817. Detail A on that drawing shows the mounting which uses a 3/4 inch bolt and nut as the fastener and the existing frame hole used by the cargo box mount. This provides an isolated attachment in the front, allowing the truck frame to twist as it travels without undue interference from the bed. This allows the bed to “float” on the frame as the frame twists during travel. Appendix C discusses do and don’t about drill holes and welding on frame rails.

Fuel Fill Location

When locating the vehicle’s fuel fill opening, choose a location no lower than it was on the cargo box. If you are using this information as a concept for a purchased cab and chassis, consult the manufacturer for the fill opening dimensions. These are found in their “Body Builders” publication.

Mounting the Tank and Accessories to the Bed

Because the bed plate is of substantial strength, accessories can be bolted directly to it. Auxiliary pump engines should be mounted on motor mounts to accommodate vibration. Study the placement of these items to make sure the vehicle is balanced. More on this is found in the following section.
A Note About Vehicle Loads

The operating weight of the vehicle must be within the safe limits determined by the vehicle manufacturer. The manufacturer of each truck determines the Gross Vehicle Weight Rating (GVWR) for that vehicle. The GVWR is the maximum design load. The manufacturer also lists the Front Axle Weight Rating (FAWR) and Rear Axle Weight Rating (RAWR). These are the maximum design loads on each axle. None of these ratings should be exceeded. For wildfire control uses, it is good practice to reduce the load. A fire truck is fully loaded almost all the time. This is a heavier duty than the average pickup truck use profile. Loading the truck at 85 to 90 percent of the weight ratings will reduce operating costs, extend the life of the truck, and provide a margin to allow for some additional equipment beyond the standard compliment.

Weigh the final vehicle, fully loaded for operation, before putting it in service to assure that it does not exceed weight limits.

REC provides other resources related to this subject listed below. They can be found at www.RoscommonEquipmentCenter.com.

Project No. 61, Slip-On Water Tank Units: Discusses topics important to selecting and installing a slip-on tank on a pickup truck. Much of this information relates to flatbed designs as well. The contents include material selection, securing the tank unit to the vehicle, and proper loading of the tank. There is a listing of other useful publications, designs, and tank retailers. The online version is downloadable using Adobe Acrobat Reader.

Newsnote No. 3, Guidelines for Designing Wildland Fire Engines: This is a primer for those planning to fabricate a fire truck. It includes basic design needs, legal, and safety requirements, and a list of other resources. The online version includes hyperlinks to other resources.

Slip-On Engine Weight Calculator: Located on REC’s web site, this calculator provides a simplified version of the “Wildland Engine Weight Calculator” which is designed specifically for those installing a slip-on tank into a pickup truck cargo box. It also can be used during the design process to help determine the placement of components on the engine and to determine tank size. For this calculation, the user must enter the weight and location of the components to be added to the truck. An estimated finished weight is provided, plus a brief analysis of the viability of the load.
## Drawing List

### OVERALL ASSEMBLY

<table>
<thead>
<tr>
<th>Drawing Number</th>
<th>Drawing Name</th>
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<tbody>
<tr>
<td>29-9817</td>
<td>5/4 Ton Bed and Nerf Bar A/C</td>
</tr>
</tbody>
</table>

### TRUCK BED DETAILS

Drawing no. 29-0085 is the overall weld complete of the truck bed. It is followed by the Truck Bed Subweld, which is the skeletal framework for the complete bed. The detail prints of individual parts follow these two drawings in the order listed below.

<table>
<thead>
<tr>
<th>Drawing Number</th>
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<tbody>
<tr>
<td>29-0085</td>
<td>Truck Bed W/C</td>
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<tr>
<td>00-1381</td>
<td>Truck Bed S/W</td>
</tr>
<tr>
<td>00-0123</td>
<td>Tie Down</td>
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<tr>
<td>00-1355</td>
<td>End Rail</td>
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<td>00-1356</td>
<td>Side Rail</td>
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<td>00-1357</td>
<td>Crossmember, Long</td>
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<td>00-1358</td>
<td>Crossmember, Short</td>
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<td>00-1359</td>
<td>Frame Rail</td>
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<td>00-1360</td>
<td>Headache, Vertical</td>
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<td>Headache, Cross</td>
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<td>00-1364</td>
<td>Bumper, Lower</td>
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<td>00-1366</td>
<td>Gusset, Receiver</td>
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<td>00-1367</td>
<td>Bumper, Angle</td>
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<td>Mount Bar, Rear</td>
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<td>00-1369</td>
<td>Mount Bar, Front</td>
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<tr>
<td>00-1370</td>
<td>Gusset, Rear Mount</td>
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<tr>
<td>00-1371</td>
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<td>00-1373</td>
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STEP AND ROCKER PANEL (NERF) GUARD
The step and rocker panel guard is an independent assembly and can be added or deleted from the project. Drawing 29-0086 shows the completed weldment with part details and subwelds following.

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**Section F-F**

**Scale 1/4**

**Part No. 29-0085**

**EST WT: 712.05 LBS**

**Date:** 14-May-2001

**Drawn:**

**Approved:**

**Designed:**

**Forest Fire Experiment Station**
PART NO: 00-1359
MAT'L: CHANNEL 3 x 4.1 #/FT
K02600
FFES SPEC NO: AH-03041AG
EST WT: 30.00 LBS
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<td>MAT'L:</td>
<td>TUBE, SQ 2x2x1/8 WALL K03000</td>
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<td>FFES SPEC NO.</td>
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<tr>
<td>EST WT:</td>
<td>1.75 LBS</td>
</tr>
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<table>
<thead>
<tr>
<th>STD. TOL.</th>
<th>FRACTIONAL</th>
<th>ANGULAR</th>
<th>DECIMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 TO 6 IN + - 1/32</td>
<td>+ - 1 DEG.</td>
<td>1 PLACE + - 0.06</td>
</tr>
<tr>
<td></td>
<td>6 IN AND UP + - 1/16</td>
<td></td>
<td>2 PLACE + - 0.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 PLACE + - 0.005</td>
</tr>
</tbody>
</table>

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68    ROSCOMMON, MICHIGAN   48653

DRAWN: DGP
DESIGNED: KDB
APPROVED: [Signature]
DATE: 07-May-2001
SCALE: 1/2

PROJECT NO.: 00-6
TITLE: HEADACHE, VERTICAL
PART NO: 00-1361
MAT'L: TUBE, SQ 2x2x1/8 WALL
K03000
FFES SPEC NO: AE-20004AY
EST WT: 8.08 LBS

P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

DRAWN:  DGP
DESIGNED:  KDB
APPROVED:  

DATE:  07-May-2001
SCALE:  1/2

FOREST FIRE EXPERIMENT STATION

PROJECT NO: 00-6  TITLE: HEADACHE, ANGLE

STD. TOL.

FRACTIONAL
0 TO 6 IN + - 1/32
6 IN AND UP + - 1/16

ANGULAR:
+ - 1 DEG.

DECIMAL:
1 PLACE + - 0.06
2 PLACE + - 0.03
3 PLACE + - 0.005
PART NO: 00-1362
MAT'L: TUBE, SQ 2x2x1/8 WALL
K03000
FFES SPEC NO: AE-20004AY
EST WT: 16.19 LBS

65-3/8

1-5/8
TYP

2

2

1/8

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

DRAWN:
DGP

DESIGNED:
KDB

APPROVED:

DATE:
07-May-2001

SCALE:
1/2

SIZE: A

PROJECT NO: 00-6
TITLE: HEADACHE, TOP

1 TO 4 IN + - 1/32
6 IN AND UP + - 1/16

ANGULAR:
+ - 1 DEG.

DECIMAL:
1 PLACE + - .06
2 PLACE + - .003
3 PLACE + - .0005
PART NO: 00-1363
MAT'L: TUBE, SQ 2x2x1/8 WALL
K03000
FFES SPEC NO: AE-20004AY
EST WT: 17.82 LBS

70-5/8
TYP
7/16

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

HEADACHE, CROSS
FOREST FIRE EXPERIMENT STATION
P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

GUSSET, RECEIVER

MODEL:

PART NO: 00-1366
MAT'L: BAR, FLAT 1/4 X 5 HR
       G10200
FFES SPEC NO: AB-00420AA
EST WT:  2.25 LBS
PART NO: 00-1367
MAT'L: TUBE, SQ 2x2x1/8 WALL
K03000
FFES SPEC NO: AE-20004AY
EST WT: 5.29 LBS
PART NO: 00-1370
MAT' L: BAR, FLAT 3/8 X 3-1/2 HR
G10200
FFES SPEC NO: AB-00614AA
EST WT: 3.33 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

TITLE: GUSSET, REAR MOUNT
PART NO: 00-1371
MAT'L: TUBE, SQ 1 X 1 X 14GA WA
       G0100
FFES SPEC NO: AE-10001AL
EST WT: 6.80 LBS
PART NO: 00-1372
MAT'L: TUBE, SQ 1 X 1 X 14GA WA
G0100
FFES SPEC NO: AE-10001AL
EST WT: 0.74 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

DRAWN: DGP
DESIGNED: KDB
APPROVED:
DATE: 08-May-2001
SCALE: 1/2

PROJECT NO.: 00-6  TITLE: SIDE RAIL, REAR
PART NO: 00-1373
MAT' L: TUBE, SQ 1 X 1 X 14GA WA
G10100
FFES SPEC NO: AE-10001AL
EST WT: 0.49 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

TITLE: SIDE RAIL, VERTICAL
FOREST FIRE EXPERIMENT STATION
P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

TITLE: GUSSET, FRONT MOUNT

PART NO: 00-1378
MAT’L: BAR, FLAT 1/4 X 1-1/2 HR
G10200
FFES SPEC NO: AB-00406AA
EST WT: 0.21 LBS

STD. TOL.

<table>
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<th>FRACTIONAL</th>
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<tr>
<td>6 IN AND UP + - 1/16</td>
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<tr>
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<tr>
<td>2 PLACE + - .03</td>
<td></td>
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<tr>
<td>3 PLACE + - .005</td>
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PROJECT NO.: 00-6

DATE: 09-MAY-2001
SCALE: FULL

DWG. NO. 00-1378
SIZE: A
PROTRUSIONS THIS SIDE

29-1/2
23-1/2
6
29-9/16
37-5/8

\( \varnothing 4-1/2 \) TYP

11-1/2

PART NO: 00-1380
MAT’L: SAFETY PLATE, 4 WAY 1/8 4X8 HR
FFES SPEC NO: AA-00248BA
EST WT: 15.18 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

PROJECT NO: 88-6
TITLE: COVER, REAR RH
PART NO: 00-1448
MAT'L: BAR, FLAT 1/4 X 1-1/2 HR
G10200
FFES SPEC NO: AB-00406AA
EST WT: 0.21 LBS

DIMENSIONS:
21
9-1/2
19

HOLE:
Ø 7/16
3 PLACES

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

TITLE: FUEL TANK GUARD, MOUNT
PART NO: 00-1453
MAT'L: EXPANDED METAL 3/4 NO. 10
FFES SPEC NO: AP-31049AR
EST WT: 29.92 LBS
PART NO: 00-1454
MAT'L: SHEET 7GA 4X8 HR PICK&OIL
ASTM-A569
FFES SPEC NO: AA-G0748AP
EST WT: 0.56 LBS
PART NO: 00-1455
MAT'L: SHEET 7GA 4X8 HR PICK&OIL
ASTM-A569
FFES SPEC NO: AA-G0748AP
EST WT: 0.58 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

DRAWN: DGP
DESIGNED:
APPROVED:
DATE: 28-NOV-2001
SCALE: FULL

PROJECT NO.: TITLE: RECEIVER, TOP-BOTTOM

Dwg No. 00-1455
PART NO: 00-1467
MAT'L: SHEET 7GA 4X8 HR PICK & OIL
ASTM A569
FFES SPEC NO: AA-G0748AP
EST WT: 0.13 LBS
BRACKET, LIGHT MOUNTING

TYPE: FOR SEALED OVAL LAMPS W/A RECESS RUBBER GROMMET MOUNT
USAGE: SIGNAL-STAT LAMPS P/N'S 4070, 4070A & 4072
MATERIAL: STEEL
COLOR: BLACK
EST. WT: 1.00 LBS

APPROVED MANUFACTURERS

SIGNAL-STAT LIGHTING
SOUTHFIELD, MICHIGAN 48034

PART NO
9292

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

DRAWN: B. GREENLY
CHECKED:
APPROVED:

MICHIGAN DNR
FOREST MANAGEMENT DIVISION

PROJECT NO: 90-4

SCALE: 1:4
DATE: 01 NOV 95
DRAW NO: 28-8007B
PART NO: 00-1437
MAT' L: PIPE 1 1/2 NOM SCH 40 STRUCTURAL
K03000
FFES SPEC NO: AF-04024AY
EST WT: 4.98 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

DRAWN: DGP
DESIGNED: KDB
APPROVED:
DATE: 07-Nov-2001
SCALE: 1/2

STD. TOL.
FRACTIONAL
0 TO 4 IN  + - 1/32
4 IN AND UP  + - 1/16
ANGULAR:
+ - 1 DEG.
DECIMAL:
1 PLACE  + - .06
2 PLACE  + - .003
3 PLACE  + - .0005

TOGGLE
PROJECT NO: TITLE: PIPE, REAR

Dwg. No. 00-1437
PART NO: 00-1439
MAT'L: BAR, FLAT 3/8 X 4 HR
GI0200
FFES SPEC NO: AB-00616AA
EST WT: 0.64 LBS

STD. TOL.

FRACTIONAL
0 TO 6 IN + - 1/32
6 IN AND UP + - 1/16

ANGULAR:
+ - 1 DEG.

DECIMAL:
1 PLACE + - 0.06
2 PLACE + - 0.03
3 PLACE + - 0.005

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

PROJECT NO.: 00-6
TITLE: GUSSET, REAR

DRAWN: DGP
DESIGNED: KDB
APPROVED: 
DATE: 07-Nov-2001
SCALE: 1/2

DNG. NO: 00-1439 SIZE A
PART NO: 00-1441
MAT'L: BAR, FLAT 3/8 X 4 HR
G10200
FFES SPEC NO: AB-00616AA
EST WT: 0.96 LBS
PART NO: 00-1442
MAT'L: PIPE 3 NOM SCH 40 BLACK K03000
FFES SPEC NO: AT-0404BAY
EST WT: 0.28 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

PROJECT NO: CAP, FRONT PIPE NOTCH
PART NO: 00-1443
MAT'L: BAR, FLAT 3/8 X 1-1/2 HR
G10200
FFES SPEC NO: AB-00606AA
EST WT: 1.03 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

DRAWN: DGP
DESIGNED: KDB
APPROVED: 
DATE: 26-Jan-2002
SCALE: 1/2

PROJECT NO: 00-6
TITLE: STIFFENER, REAR MOUNT

STD. TOL.
FRACTIONAL
0 TO 4 IN. + - 1/32
6 IN AND UP + - 1/16
ANGULAR:
+ - 1 DEG.
DECIMAL:
1 PLACE + - 0.06
2 PLACE + - 0.03
3 PLACE + - 0.005

SIZE A
PART NO: 00-1445
MAT'L: BAR, FLAT 3/8 X 3-1/2 HR
G10200
FFES SPEC NO: AB-00614AA
EST WT: 2.41 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68   ROSCOMMON, MICHIGAN   48653

DRAWN: DGP
DESIGNED: KDB
APPROVED: 
DATE: 08-Nov-2001
SCALE: 1/2

PROJECT NO:  TITLE: VERTICAL, REAR BRACKET

STD. TOL.
FRACTIONAL
0 TO 6 IN + - 1/32
6 IN AND UP + - 1/16
ANGULAR: + - 1 DEG.
DECIMAL:
1 PLACE + - 0.06
2 PLACE + - 0.03
3 PLACE + - 0.005
PART NO: 00-1446
MAT'L: BAR, FLAT 3/8 X 3-1/2 HR
G10200
FFES SPEC NO: AB-00614AA
EST WT: 0.95 LBS

ADJUST TO FIT FRAME

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68  ROSCOMMON, MICHIGAN  48653

DRAWN: DGP
DESIGNED: KDB
APPROVED: 
DATE: 08-Nov-2001
SCALE: 1/2

PROJECT NO: 00-6
TITLE: BOTTOM, REAR BRACKET
PART NO: 00-1447
MAT'L: BAR, FLAT 1/4 X 2 HR
GF0200
FFES SPEC NO: AB-00408AA
EST WT: 0.92 LBS
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PART NO: 29-0087
EST WT: 5.18 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

PROJECT NO: BRACKET, REAR W/C
PART NO: 29-0089
MAT'L: SHEET 7GA 4X8 HR PICK&OIL
ASTM A569
FFES SPEC NO: AA-G0748AP
EST WT: 1.11 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

DRAWN: DGP
DESIGNED: KDB
APPROVED: 
DATE: 15-NOV-2001
SCALE: 1/2

STD. TOL.
FRACTIONAL
0 TO 6 IN: + - 1/32
6 IN AND UP: + - 1/16
ANGULAR: + - 1 DEG.

DECIMAL:
1 PLACE: + - 0.06
2 PLACE: + - 0.03
3 PLACE: + - 0.005

PROJECT NO: 00-6
TITLE: SPACER, FRONT

SIZE A
PART NO: 29-0090
MAT'L: BAR, FLAT 1/4 X 2 HR
G10200
FFES SPEC NO: AB-00408AA
EST WT: 0.48 LBS

FOREST FIRE EXPERIMENT STATION
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

TITLE: SPACER, REAR
Appendix A - Slip-On Tank References

The following references include additional information on this topic. Suppliers names are listed for the convenience of the reader and should not be taken as an endorsement, nor is the supplier listing complete. It is certain that there are many small slip-on manufacturers not included in the documents listed below.

References

Water Handling Equipment Guide, National Wildfire Coordinating Group, March 1994. This publication has photographs and lists specifications for wildland fire units across the Nation. Some of these are slip-on type units. Order NFES #1275 from the National Interagency Fire Center, ATTN: Great Basin Cache Supply Office, 3833 South Development Avenue, Boise, Idaho 83705.

Wildland Fire Engine Component Guide, National Wildfire Coordinating Group, March 1994. Lists and discusses common components found on wildland fire vehicles. This publication has chapters which discuss tanks, pumps, and other components. Order NFES #1871 from the National Interagency Fire Center, ATTN: Supply, 3905 Vista Avenue, Boise, Idaho 83705.


REC Slip-On Tank Designs

REC has several publications that feature slip-on tanks with complete design details. These provide design ideas for those intending to contract for or make their own tanks.

REC Project #33, Tanker Handbook, Military 1-1/4 Ton, 4x4 Cargo Truck, includes design details for a 200 gallon steel slip-on unit. Available as a booklet.

REC Project #34, Tanker Handbook, Military 3/4 Ton, 4x4 Cargo Truck, includes design details for a 150 gallon steel slip-on unit. Available as a booklet.

REC Project #40, Tanker Handbook, Military 880 Series 1-1/4 Ton, 4x4 Cargo Truck (Dodge W-200), includes design details for a 200 gallon steel slip-on unit. Available as a booklet.


Poly Tank Suppliers

The following is a list of known polymer tank manufacturers. Listing does not constitute an endorsement. REC Project #61 has a list of some slip-on tank suppliers for those looking for a complete pump and tank assembly.

LeVan Manufacturing, Inc.  
2440 SW Ferry Street, Ste. D, P.O. Box 1023, Albany, OR 97321  
Telephone: (541) 924-5653 or 1-888-674-0030  
Web Site: www.levanmfg.com

Pro Poly of America, Inc.  
1821 Northwest 57th Street, Ocala, FL 34475  
Telephone: (352) 629-1414  
Web Site: www.propolyamerica.com

United Plastic Fabricating, Inc.  
165 Flagship Drive, North Andover, MA 01845  
Telephone: 1-800-638-8265  
E-mail: info@unitedplastic.com  
Web Site: www.unitedplastic.com
Appendix B - Poly Tank Specifications

Polymer Water Tank
Specifications for Part No. 23-0094

USE: The product will be used as a water tank mounted on a steel flatbed of a truck. The tank will be used for wildfire control. The vehicle will be operated off-road a portion of the time.

CONSTRUCTION: The tank will be constructed using the manufacturer’s fire service grade polymer (polypropylene or polypropylene/polyethylene blend) material. Material on outside of tank shall be opaque, black in color, and UV resistant. Exception to this can be made for tank bottom, hose reel mounting pads and sight gauge. The outer sides and top must be 1/2 inch thick. The bottom must be 3/4 inch thick. Internal material for baffles or gussets must be 3/8 inch thick minimum and can be of a suitable nonopaque material. Baffling must allow for adequate water and air flow based on 125 gallon/minute pump performance. Welds must meet industry quality and appearance standards.

TANK DIMENSIONS: See drawing (23-0094B) for overall dimensions.

FILL TOWER: A rectangular-shaped fill tower will be provided on the front left top of the tank near the corner. It shall have a hinged lid, and a screen with maximum 1/4 inch diameter holes to filter water entering the fill port. The inside opening shall be a minimum of 45 square inches. The inside minimum dimensions shall be at least 6 inches. A 4 inch diameter vent/overflow pipe shall be incorporated in the fill tower. The drawing shows the overflow pipe outlet location.

SUM: The tank shall have a sump as shown in the drawing. It shall include a 3 inch FNPT threaded clean-out with plug. It also shall have a 3/4-inch FNPT drain with plug. Both of these will be on the sump bottom. A dip pipe shall run from the suction outlet to the sump. It’s end shall be submerged approximately 3 inches deep into the sump opening.

SUCTION AND FILL PORTS: The rear wall of the tank shall have ports placed as shown in the drawing. The suction port shall be threaded 2-inch FNPT. The fill inlet shall be 1-1/2 inch FNPT. The fill inlet can be moved ± 2 inches (left or right) to accommodate baffle placement.

TANK MOUNTING PADS: The manufacturer shall provide adequate mounting pads for the purchaser to fasten the tank by threaded fasteners to the truck bed. It is preferred to have a four point mount, with a mounting point at each corner of the front and back tank walls.

CONTACT: It is the purchaser’s intent to allow the manufacturer to use its normal fire tank construction concepts within the dimension constraints provided. If that cannot be accommodated by these requirements, please contact (your name and telephone number), with any proposed variance.
NOTES:
1. CONTRACTOR’S STD FILL TOWER MAY BE USED. LOCATE FRONT LEFT OF TANK TOP.
   MIN FILL AREA 45 SQ IN. INCLUDE SCREEN AND HINGED TOP. APPROX HT 8 IN.
2. HOSE REEL MOUNT LOCATION
3. TOLERANCE ON SUMP SIZE AND LOCATION - 1/4 IN. INCLUDE 3" FNPT CLEANOUT &
   3/4" FNPT DRAIN OPENING WITH PLUGS AT BOTTOM OF SUMP.
4. TANK FILL LOCATION 1-1/2" FNPT.
5. TANK SUCTION LOCATION 2" FNPT INSTALL 2" SCH 40 DIP PIPE FROM SUCTION
   PORT TO APPROX CENTER OF SUMP. THIS TANK WILL BE USED ON OFF-ROAD
   VEHICLE AND DIP PIPE MUST BE SUPPORTED FOR SUCH USE.
6. OVERFLOW MONITOR PIPE EXIT LOCATION. 4" PIPE.
7. SIGHT GAUGE LOCATION.

MOUNTING TABS ARE NOT SHOWN IN DRAWING BUT MUST BE INCLUDED. THEY MAY BE
THE MANUFACTURER’S PREFERRED SYSTEM ATTACHED TO THE FRONT AND BACK OF TANK.
THE TABS MUST NOT EXTEND MORE THAN 4" FROM THE FRONT OR BACK WALLS.
Appendix C - Drilling Holes in Truck Frame Rails

From time to time it is necessary to mount an item to a truck’s frame rails. The frame rails are the most substantial mounting points available, but altering or modifying these parts should not be taken lightly. Before drilling into the frame, check with the truck manufacturer for information on what is allowable. If the manufacturer says not to, don’t do it. Below are some things you should consider.

- Use existing holes, whenever possible. The manufacturer puts many holes in frames for the variety of optional items they may need to mount. Many of these will be unused. See if you can use some of these existing holes to accomplish the mounting. Often this will be the case.

- Do not drill holes in the frame flanges or upper or lower part of the web without guidance from the truck manufacturer. Figure C-1 shows the important parts of a frame channel. The channel’s flanges contribute greatly to the strength of the frame. Weakening them by drilling holes is not advisable, unless you have the technical expertise or information that says otherwise.

- If holes are necessary, plan to drill any holes along or near the neutral axis of the frame. Most truck frames are symmetrical top to bottom, which means that the neutral axis is the center line of the frame (halfway down from the top). Figure C-1 illustrates the location of the neutral axis and shows two holes located directly along it. The darker gray stripe illustrates the approximate zone in which it’s normally safe to drill.

- Do not drill holes too close together. A 2 inch minimum spacing is desirable but it is wise to check with the manufacturer for their advice.

- Watch out for other components when you drill. Brake, fuel, and electrical lines are normally routed inside the frame rails.

Some might have the urge to weld brackets to a truck frame rail. We strongly discourage this practice, unless you have direct consultation with the truck manufacturer. Welding may change the metallurgical composition and therefore the strength of some frame rail materials. Additionally, welded designs almost certainly will require welds somewhere other than the neutral axis. Only those with the proper technical knowledge and experience should attempt to weld brackets or other components to the truck’s frame rail.