

**Roscommon
Equipment
Center**

PROJECT NO. 4

JEEP

TANKER

HANDBOOK

NORTHEAST FOREST FIRE SUPERVISORS

JEEP TANKER HANDBOOK
Roscommon Equipment Center
Project #4

CONTENTS

| | <u>Page</u> |
|---|-------------|
| Table of Contents and Disclaimer ----- | i |
| Introduction ----- | 1 |
| Background Information ----- | 2 |
| Operating Instructions: | |
| Vehicle ----- | 4 |
| Pumper ----- | 6 |
| Maintenance: | |
| Vehicle ----- | 8 |
| Pumper ----- | 9 |
| Checklist ----- | 13 |
| Modification for Fire Fighting Use: | |
| Assembly Instructions ----- | 15 |
| Plans ----- | 13 |
| Guidelines for Accountability of Federal Excess Property ----- | Back Cover |

DISCLAIMER

Much of the information was taken from Department of the Army Technical Manuals. Those who would like more detailed information on the 1/4 ton 4x4 Utility Truck M38A1 should review TM 9-8014 to 36A-1-401.

The information contained in this report has been developed for the guidance of the member States, Provinces, and Federal Agencies and their cooperators. The Northeast Forest Fire Supervisors assume no responsibility for the interpretation by those member organizations.

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INTRODUCTION

Many military jeeps are being used in wildfire control. They are a useful tool on initial attack where topography and fuel conditions permit them to be driven off the road and parallel or close to the fire edge. They also are a good scout vehicle or mobile command post. Great variations exist in tank and plumbing design and other modifications. Some are unsafe, some are inefficient, some are too expensive. This design was one of the original projects selected for the REC program when it began in 1972. Design work was completed and copies of the plans were distributed on October 10, 1972.

The system includes a 66-gallon tank, nylon roller-type pump, brush and rollover protection, and emergency lights and signals. Outrigger spray nozzles at the front permit safe and easy running attack.

The modified unit, full of water, will safely carry two men plus 200 pounds of additional equipment. Radios, handtools, extra hose, backpack pumps and cans, and miscellaneous gear should not exceed the 200 pound limit unless all travel will be on surfaced roads.

Four prototypes were built and distributed for evaluation. Indiana received the first in early 1973. Delaware, Illinois, and West Virginia received units that fall. Evaluation reports have documented only minor problems, and there were only a few recommendations for improvements.

In the three years since the plans were first distributed (1973-1975), there have been 215 jeeps acquired through the Excess Property Program in the 20-State Northeastern Area. Many were modified using the original plans. Comments were solicited from the users of these units also. Evaluation reports and other comments were studied, and certain changes have been made in the revised drawings included with this report.

We want to continue to improve the design. While we feel that this edition is now the best available, we would appreciate your comments and suggestions for improvement. Please address such material to one of the following:

Roscommon Equipment Center
Roscommon, Michigan 48653

Cooperative Forest Fire Management
NA-S&PF, U. S. Forest Service
6816 Market Street
Upper Darby, PA 19082

BACKGROUND INFORMATION

This booklet describes the 1/4 ton Military 4x4, commonly called the "Army Jeep", and the modification for a slip-on tanker designed under the Roscommon Equipment Center Program. Army Models M38, M38A1, and the Ambulance M170 are included.

Power for the vehicle is supplied by an F-head, four-cylinder, four-cycle, water-cooled, gasoline engine. The synchromesh 3-speed transmission is mounted on the rear of the engine. Speeds are manually selected. The transfer is a manually controlled two-speed unit which distributes power to both the front and rear axles if desired. The electrical system is 24 volts.

The Ambulance M170 has a longer body and frame plus lower rate springs and shock absorbers for easier riding. The M38A1 differs from the M38 in that it is a newer model with a more streamlined appearance, rounded fenders, and slightly longer frame dimensions.

Several plates are located on the instrument panel at the right of the instrument cluster. The weight and dimension data plate provides information on the vehicle dimensions, weights, and maximum towed loads. There is also a shifting instruction plate, speed caution plate, and servicing data plate. The operator should be familiar with all of them.

The slip-on tanker designed by the Roscommon Equipment Center incorporates a T-shaped 66-gallon steel tank, an Aerosprayer nylon roller-type pump, front mounted spray nozzles, an armoring system, and emergency lights and siren.

The pump engines are single-cylinder, L-head, and air-cooled. Models made by Briggs and Stratton Corporation of Milwaukee, Wisconsin, are in the 80300 to 80492 series.

TABULATED DATA

JEEP:

| | |
|--------------------------------------|------------|
| Cooling System | 11-1/2 qt. |
| Crankcase | 4-1/2 qt. |
| Differential (each) | 2-1/2 qt. |
| Fuel Tank, M38 and M38A1 | 17 gal. |
| Fuel Tank, M170 | 20 gal. |
| Transmission | 1 qt. |
| Transfer Case | 3 pt. |
| Ground Clearance | 9-5/16 in. |
| Payload - Cross Country | 800 lbs. |
| Payload - Highway | 1,200 lbs. |
| Maximum Allowable Speed | 60 mph |
| Cruising Speed | 55 mph |
| Angle of Maximum Approach (uphill) | 46° |
| Angle of Maximum Approach (downhill) | 34° |

SLIP-ON TANKER:

| | |
|----------------------------|--------------------------------|
| Weight | 75 lbs. empty |
| Tank Capacity | 66 gallons |
| Pump Performance @ 800 rpm | psi 0 50 100 200 |
| | gpm 14 12.75 11.6 9.5 |
| Hose Length | 25 feet |

PUMP ENGINE:

| | |
|------------------------|----------------------|
| Bore | 2-3/8" |
| Stroke | 1-3/4" |
| Displacement..... | 7.75 cu. in. |
| Horsepower..... | 3.00 max. @ 3500 rpm |
| Torque (Ft. Lbs.)..... | 4.6 max. @ 3100 rpm |

The horsepower ratings listed above are established in accordance with the Society of Automotive Engineers Test Cost - J607. For practical operation, the horsepower loading should not exceed 85% of these ratings. Engine power will decrease 3-1/2% for each 1,000 feet above sea level and 1% for each 10° above 60° F.

TUNE-UP SPECIFICATIONS

| | | | |
|--------------------------|---------------|----------|---------------|
| Spark Plug Type | A.C. | Autolite | Champion |
| Short Plug | CS.45 | A7N | CJ-8 |
| Long Plug | GC.46 | A71 | J-8 |
| Spark Plug Gap | | | .030" |
| Ignition Point Gap | | | .020" |
| Valve Clearance | Intake..... | | .005" - .007" |
| | Exhaust | | .009" - .011" |

VEHICLE OPERATING INSTRUCTIONS

Starting Vehicle - Make a daily pre-operation check using the check-list on page 13. When starting the engine, pull the choke all the way out unless the engine has been recently operated and is still warm. DO NOT hold starter engaged for longer than 30 seconds to avoid overheating and resultant damage.

After the engine starts, push the choke in until the engine is running smoothly. The oil pressure gauge should show at least 10 psi. The ammeter should show a charge with lights turned off when engine is running at a fast idle. Normal operating temperature on the water temperature gauge is between 160° and 180° F.

The front axle should not be engaged unless travelling cross-country or in unusual road conditions such as mud or snow.

CAUTION: Never depress the clutch pedal or disengage the transmission when descending hills.

Shifting Gears in Transfer - The transfer front wheel drive gearshift lever and the transfer high and low range gearshift lever provide for applying power to the front axle as well as the rear. In addition, the low range gear provided by the transfer doubles the number of speed ranges provided by the transmission. The selection of the various gear ratios depends on the load and road conditions. Shift gears in the transfer in accordance with the instructions on the shifting instruction plate and observe the warnings on the speed caution plate.

The selection of the transmission gears does not affect the selection or shifting procedure of the transfer. The vehicle may be driven by the rear axle alone, or by both the front and rear axles.

A. Engaging Front Axle

1. The front axle should be engaged only for off-the-road operation, slippery roads, steep grades, or during hard pulling. In ordinary use, on average roads, and under normal conditions, the front axle should be disengaged. The front axle can be engaged with the vehicle stopped or in motion. The transfer must be in front axle drive for use of transfer LOW range.
2. To engage the front axle, depress the clutch pedal to facilitate shifting. Pull the transfer front wheel drive gearshift lever to the rear or IN position.
3. To disengage the front axle, depress the clutch pedal to facilitate shifting and push the transfer front wheel drive gearshift lever forward to the OUT position.

B. Selecting LOW or HIGH Range Speeds

1. For normal operations, the transfer high and low range gearshift lever should be in the rear or HIGH position. With the lever in this position, the vehicle may be operated in either two or four wheel drive.
2. To shift the transfer to LOW range position (when not in four wheel drive), move the transfer front wheel drive gearshift lever to the rear or IN position, move the transfer high and low range gearshift lever forward to the LOW position.

CAUTION: Do not shift high and low range gearshift level from high to low at speeds above 5 mph.

3. Whenever possible, halt the vehicle before shifting the transfer high and low range gearshift lever from LOW to HIGH range or from HIGH to LOW range. Depress the clutch pedal to facilitate shifting. In some cases, when shifting the transfer gearshift levers, it may be necessary to "double clutch."

Operating the vehicle in snow, on ice, or in deep mud, may require tire chains. Chains must always be installed in pairs (front or rear) to prevent damage to the power train.

Operating in sand requires daily cleaning of the air cleaner, fuel filter, and oil filters. Engine vents and other exposed vents should be covered with fire resistant cloth.

Lowering tire pressures when driving in snow, ice, mud, or sand will help to increase traction if tire chains are not available. Keep at least 15 psi to avoid damaging the tires.

PUMP OPERATING INSTRUCTIONS

This system is equipped with a roller pump with nylon covered rollers. These pumps are fairly inexpensive and easy to maintain, but require certain care:

Starting - Before starting engine, unscrew by-pass valve adjustment screw several turns. This will release pressure on the hose. After starting engine adjust pressure by turning by-pass screw.

Spraying - The pumper is equipped with an adjustable nozzle. For various types of spray turn the handle to spray desired.

PUMP ENGINE OPERATING INSTRUCTIONS (Briggs & Stratton Models 80300 to 80492)

IN THE INTEREST OF SAFETY, DO NOT RUN ENGINE AT EXCESSIVE SPEEDS. Pumping at excessive speeds increases the chance of personal injury. DO NOT TAMPER WITH PARTS WHICH MAY INCREASE THE GOVERNED SPEED.

TO PREVENT ACCIDENTAL STARTING always remove the spark plug before working on the engine or equipment driven by the engine, or, remove cable from spark plug and insert terminal in V-notch in cylinder head cover.

DO NOT RUN THE ENGINE IN AN ENCLOSED AREA. Exhaust gases contain carbon monoxide, an odorless and deadly poison.

DO NOT FILL GASOLINE TANK WHILE ENGINE IS RUNNING. Spilling gasoline on a hot engine may cause a fire or explosion.

Before Starting

1. Fill crankcase with oil - Use a high quality detergent oil classified "For Service SC, SD, SE, or MS." Nothing should be added to the recommended oil.

SUMMER

(Above 40° F.)
Use SAE 30

If not available
Use SAE 10W-30
or
SAE 10W-40

WINTER

(Under 40° F.)
Use SAE 5W-20 or SAE 5W-30

If not available
Use SAE 10W or SAE 10W-30

Below 0° F.
Use SAE 10W or SAE 10W-30
Diluted 10% with Kerosene

Directions - Place engine level. Use screw driver or bar to remove oil filler plug. Fill crankcase to point of overflowing. POUR SLOWLY. Capacity 1-1/4 ton.

2. Fill Fuel Tank - Use clean, fresh, lead-free or leaded, regular grade automotive gasoline. Fill tank completely.

DO NOT MIX OIL WITH GASOLINE.

3. Fill oil bath cleaner - Oil bath air cleaners used on some models require initial service prior to operating engine. (Section 3)

Starting

1. Open fuel valve on tank
2. Choke engine - Engine may be equipped with either manual or Choke-A-Matic controls.
 - a. Manual Choke and Stop - Be sure stop switch is away from spark plug. Move choke as necessary.
 - b. Choke-A-Matic Control - Move control on equipment as far as possible toward "Choke" or "Start" position.
3. Start engine - Engine may be equipped with rewind or rope starter.
 - a. Rewind starter - Grasp starter as illustrated and pull out cord rapidly. Repeat if necessary with choke opened slightly. When engine starts, open choke gradually.
 - b. Rope starter - Wind rope around pulley in direction shown by arrow. Pull the rope with a quick full arm stroke. Repeat if necessary with choke open slightly. When engine starts open choke gradually.

NOTE: Engine may not start if controls on powered equipment do not close fully. See Choke-A-Matic adjustment instructions in Section 4 of this manual.

4. To stop engine -
 - a. Manual control - Push stop switch against end of spark plug.
 - b. Choke-A-Matic Control - Move control lever to "Stop" position.

VEHICLE MAINTENANCE

Any items found deficient during the daily preventive maintenance check should be corrected immediately. Lubrication and/or services should be performed as follows:

Lubrication

1. 1,000 mile services:

- a. Air cleaner and breather - check daily and replenish to the bead level with regular engine oil. Every 1,000 miles clean and refill. During dusty or sandy conditions, disassemble, clean and refill daily.
- b. Universal joint and steering knuckle bearings - every 1,000 miles remove plug and fill to level. When wheels are removed for packing, remove steering knuckles, clean and repack universal joint housing. Do not disassemble constant velocity universal joint.
- c. Oil can points - every 1,000 miles oil the hand brake linings, clutch and brake pedal linkage, and pintly hook.
- d. Do not lubricate - shock absorbers, springs, clutch release, bearings, and water pump.

2. 6,000 mile services:

- a. Crankcase - drain every 6,000 miles (or semi-annually). Drain only when engine is hot. Refill.
- b. Oil filter - while crankcase is draining, remove, clean, and inspect the filter element, clean inside of case, reinstall element if satisfactory, or replace.
- c. Distributor - wipe breaker cam lightly with 1-2 drops of oil. Remove the distributor, remove plug and wick under name plate, soak wick in oil. Fill the cavity with grease. Insert wick, remove excess grease and install plug.

3. 12,000 mile services:

Gear cases - drain every 12,000 miles or annually. Drain only when hot after operation. Fill to plug levels before operation and after draining.

4. Operations in unusual conditions:

After operation in dusty or sandy conditions, clean and inspect all points of lubrication for fouled lubricants and relubricate as necessary.

Areas needing special attention

1. Wheels - Each vehicle is equipped with four standard drop-center, interchangeable operating wheels and one spare. Each operating wheel is mounted on the wheel-hub by five studs, pressed into the hub. A taper on the inside of each hub nut positions the wheel to allow clearance between wheel and hub for ease of removal. Hub studs and nuts on the left side of the vehicle have left-hand threads and are marked with the letter L. Hub studs on the right side of non-directional mud- and snow-type tires are designed for either high or low pressure operation. Inspect all wheels at regular intervals for bent rims, worn or elongated mounting stud holes, and signs of rust. Pay particular attention to edges of rims and mounting stud holes. Inspect hub studs and nuts for worn or stripped threads. Replace any defective wheel or hub nut immediately.
2. Tires - Inspect all tires and check pressures daily.
 - a. Replace any tire with noticeable cut on tread or side wall. If uneven wear is indicated, check toe-in adjustment. If incorrect toe-in is not the cause, report to shop personnel.
 - b. Check pressures when tires are cold. Dismount any tire showing unusual pressure loss and examine tire tube for cause. Repair tire tube or replace if necessary.
 - c. Inflate all tires to equal pressures as unequal pressures will affect steering and braking adversely. Inflate tires to 28 psi for regular highway or hard-surfaced road operation. Under-inflated tires are easily damaged. Install all valve caps to prevent air loss.
 - d. Tire rotation - To maintain equal wear, rotate tires at intervals of approximately 2,000 miles.
 - e. Replacement tires must be of the same design, size and tread as the tires on the vehicle. Tires of different design or tread sometimes have different rolling diameters which cause excessive.

PUMPER MAINTENANCE (ENGINE)

1. CHECK ENGINE OIL LEVEL regularly at least after each 5 hours of operation. (Take care to remove dirt around filler plug.) Be sure oil level is maintained FULL TO POINT OF OVERFLOWING.
2. CHECK OIL in 6 to 1 Gear Reduction Models by removing the oil plug in lower half of gear cover every 100 hours. Add SAE 10W-30 oil at upper oil filler plug until oil runs out of lower hole. Replace both plugs.

NOTE: Filler plug has vent hole and must be placed in top opening.

3. CHANGE OIL after first 5 hours of operation. Thereafter change oil every 25 hours of operation. Remove drain plug and drain oil while engine is warm. Replace drain plug. Remove oil filler cap and refill cap with new oil of proper grade. Replace filler cap.
4. CLEAN AND RE-OIL AIR CLEANER and element every 25 hours under normal conditions. (Clean every few hours under extremely dusty conditions.)
 - a. Remove screw.
 - b. Remove air cleaner carefully to prevent dirt from entering carburetor.
 - c. Take air cleaner apart.
 - (1) Wash foam element in kerosene or liquid detergent and water to remove dirt.
 - (2) Wrap foam in cloth and squeeze dry.
 - (3) Saturate foam in engine oil. Squeeze to remove excess oil.
 - (4) Assemble parts - fasten carburetor with screw.

5. OIL BATH CLEANER

- a. Turn filter element counter-clockwise to unscrew. Lift off filter element. Lift off bowl.
- b. Pour out old oil.
- c. Wash the filter element and bowl in kerosene or solvent and wipe dry.
- d. Pour oil in small bottom part of bowl to "OIL LEVEL" mark shown at end of arrows. Replace bowl in carburetor.
- e. Replace filter element and turn element clockwise until snug. Be sure gaskets are in place.

NOTE: Steps b and c are not required for initial service.

6. CLEANING COOLING SYSTEM - Grass, chaff, or dust may clog the cooling system after prolonged service. Continued operation with a clogged cooling system causes severe overheating and possible engine damage. Remove blower housing and clean regularly.
7. SPARK PLUG - Clean and reset gap at .30" every 100 hours of operation.

CAUTION: Blast cleaning of spark plugs in machines that use abrasive grit is not recommended. Spark plugs should be cleaned by scraping or wire brushing and washing with a commercial solvent or gasoline.

REMOVING CARBON DEPOSITS - Clean combustion chamber, top of piston, and around both valves every 100-300 hours of operation.

ADJUSTMENTS

8. CARBURETOR ADJUSTMENTS

Minor carburetor adjustments may be required to compensate for differences in fuel, temperature, altitude and load.

Initial Adjustment -

Close the needle valve (turn clockwise) carefully to avoid damaging valve. Then open it 1-1/2 turns counter-clockwise. Close the idle valve (clockwise). Open it 1/2 to 3/4 turns. This initial adjustment will permit the engine to be started and warmed up several minutes to final adjustment.

Final Adjustment -

Turn needle valve in until engine misses (lean mixture), then turn it out past smooth operating point until engine runs unevenly (rich mixture). Now turn needle valve to the mid-point between rich and lean so the engine runs smoothly. Hold throttle at idle position and set idle speed adjusting screw until fast idle is obtained (1750 rpm). Hold throttle in idle position and turn idle valve in (lean) and out (rich) until engine idles smoothly. Then reset idle speed adjusting screw so that engine idles at 1750 rpm. Release throttle - engine should accelerate without hesitation or sputtering. If engine does not accelerate properly, the carburetor should be readjusted - usually to a slightly richer mixture.

9. SPEED CONTROL ADJUSTMENTS

There are two different types of governors used on these engines - air vane and mechanical. The recommended operating speed range is 1800 to 3600 rpm. Idle speed is 1750 rpm.

a. AIR VANE ADJUSTMENT

Standard Speed Control - Speed adjusting thumb nut is located on top of engine. To increase speed, turn thumb nut counter-clockwise.

Manual Friction Control - Push knob to increase speed. Do not turn. Knob is crimped on control rod.

Remote Control - The speed of engines equipped with remote governors controls is varied by movement of the control lever illustrated on page 5. To adjust; move control lever to High Speed position. Loosen swivel screw. Move wire through swivel until Top Speed limit device reaches top. Re-tighten swivel screw. Bend loose end of wire around swivel. Cut off excess wire.

b. MECHANICAL GOVERNOR ADJUSTMENTS

Standard Speed Control - Speed adjusting thumb nut is located on top of engine. To increase speed turn adjusting thumb nut counter-clockwise.

NOTE: Spring loop should be in No. 3 hole of governor for speeds below 3100 rpm. Use No. 5 hole above 3100 rpm.

Remove Control - Mechanical governor remote controls are adjusted in the same manner as air vane controls.

STORAGE INSTRUCTIONS

Engines to be stored over 30 days should be completely drained of fuel to prevent gum deposits forming on essential carburetor parts, fuel filter, fuel lines and tank.

1. All fuel should be removed from fuel tank. Run the engine until it stops from lack of fuel. The small amount of fuel that remains in the sump of the tank should then be removed by absorbing it with a clean dry cloth.
2. Remove spark plug, pour 1 ounce of SAE-30 oil into cylinder and crank slowly to distribute oil. Replace spark plug.
3. Clean dirt and chaff from cylinder, cylinder head fins and blower housing.

PUMPER MAINTENANCE (PUMP)

After Pumping (Especially if chemicals are used) - One of the most common causes of pump failure is the accumulation of gum from various additives. This can be prevented by thoroughly flushing the pump with clear water or preferably with a solution of 1 cup ammonia in 6 gallons of water.

Rust Prevention - Flush pump with clear water then with a solution of water containing an automobile permanent-type anti-freeze, or soluble oil. Kerosene or fuel oil WILL NOT prevent rusting!

These instructions are most important if the pump is going to be idle for some time.

Storage (Winterization) - If the pump is to be stored for several days or more, follow the Rust Prevention steps, drain pump, then stop both ports with valves provided. Fill pump body with automotive permanent-type anti-freeze.

IMPORTANT - IT IS ABSOLUTELY NECESSARY THAT ABOVE INSTRUCTIONS BE FOLLOWED TO GET MAXIMUM SERVICE FROM THE PUMP.

DAILY PREVENTIVE MAINTENANCE CHECK AND/OR SERVICE

| Interval and Sequence No. | Before Operation | During Operation | After Operation | Items to be Inspected | Procedure |
|---------------------------|------------------|------------------|-----------------|---|--|
| 1 | -- | -- | -- | Oil and coolant | Check oil and coolant levels. Examine coolant for contamination. In cold weather use hydrometer to see if there is adequate anti-freeze. |
| 2 | -- | -- | -- | Water pump, fan belts, and pulleys | Inspect pulleys and fan for alignment, and bolt for tension (3/4" deflection). Inspect water pump for leaks. |
| 3 | -- | -- | -- | Electrical wiring | Visually inspect electrical wiring, conduits, connectors, and shielding. |
| 4 | -- | -- | -- | Engine compartment | Inspect engine compartment for indications of fuel, engine oil and water leaks. Look under the vehicle for indications of leaking gear oil or brake fluid. |
| 5 | -- | -- | -- | Tires | Note any apparent loss of air. Remove objects such as nails or glass. Note unusual wear or missing valve caps. (If necessary, service tires to 25 psi for cross-country or highway driving and 15 psi for mud, sand or snow operations.) |
| 6 | -- | -- | -- | Tools and equipment | Inspect vehicle tools and equipment for general conditions and power stowage. |
| 7 | -- | -- | -- | Battery | Clean, check water level, inspect terminals for tightness and coat with grease. |
| 8 | -- | -- | -- | Body, doors, glass, top and frame, curtains and fasteners | Inspect cab or body mounting, including springs. Test operations of doors, windows, windshield ventilator, hood hinges and fasteners. |
| 9 | -- | -- | -- | Lights and horn | Operate horn and windshield wipers. Inspect rear view mirrors. Check operation of exterior lights and light switches. Note whether the headlights are properly aimed. Note condition of all lights and reflectors. |

| Before Operation | During Operation | After Operation | Items to be Reported | Procedure |
|------------------|------------------|-----------------|--|--|
| 10 | 13 | -- | Service brake pedal and hand brake lever | <p>Check service brake for proper pedal travel and hand brake for proper adjustment. (Correct service brake free travel is 1/2 inch.)</p> <p>Is action of brake return spring satisfactory? Observe if pedal goes too close to floor. Make several stops, noting side pull, noise, chatter, grabbing, or any abnormal condition. See if the hand brake lever ratchet holds and if the lever requires more than three-quarters travel for full application. Stop on an incline and apply the hand brake to determine if it holds the vehicle.</p> |
| 11 | 14 | -- | Starter and starter switch | <p>With the ignition OFF, note if the starter switch requires more than normal pressure, and if the starter engages smoothly without unusual noise and turns the engine with adequate cranking speed. With ignition switch ON start engine.</p> <p><u>Caution:</u> If there is excessively low or no engine oil pressure, after a reasonable time lapse (10 seconds max.), stop engine and determine cause.</p> |
| 12 | 15 | -- | Engine | <p>In warming up engine, observe if the choke and throttle controls operate satisfactorily. Note if idling speed is correct. Listen for any unusual noises at idle and higher speeds. When operating the vehicle, note if it has normal power and acceleration in each speed range.</p> |
| 13 | -- | 17 | Radiator and cap | <p>Inspect radiator cores for clogging with foreign matter or bent fins. Check gasket in the pressure cap.</p> <p><u>Caution:</u> If it is necessary to add coolant to the radiator while engine is overheated, idle engine and add coolant slowly. Use extreme caution in removing radiator pressure cap as you may get burned.</p> |

MODIFICATION FOR FIRE FIGHTING USE - ASSEMBLY INSTRUCTIONS

Step #1 - Rear Bumper - The rear panel of the M38A1 and M38 Jeep must be removed to make room for the rear bumper unit. This panel can be cut away with an oxyacetylene torch or a heavy duty sabre saw. The finished opening should be 36" wide.

The rear bumper unit sets into this opening and the 9 flat head bolts attach the angle from sections to the sheet metal of the Jeep.

Two additional holes must be drilled in the rear cross members of the Jeep to match the two holes in the lower flange of the channel iron bumper. Use bolts to secure the rear bumper unit to the Jeep.

There are additional brackets, holders, etc. spot welded to the Jeep that must be removed. If there are reflectors or any projections attached to the rear sides of the Jeep, they should also be removed to allow the operator and equipment protection unit to be installed. It is desirable to paint the entire Jeep before installing the protection unit.

Step #2 - Front Bumper Extensions - The front bumper must be in reasonably good condition to satisfactorily attach the 3-inch channel iron extensions. If the bumper is not straight, it should be straightened.

Position the bumper extensions and clamp them temporarily in place. Extensions should be carefully centered in the front bumper and level. Locate and drill two holes in each end of the bumper to match the bumper extension. Also, locate and drill one hole in each side of the Jeep frame to match the bumper extension flange. Attach with bolts.

Step #3 - Positioning the Protection Unit - This can best be done by raising the protection unit above the Jeep and lowering it into place. The rear part will rest on and be supported by the rear bumper. The front will be supported by the bumper extensions. Do not weld at these points, front and rear, until later.

Attach the four 3-inch channel iron frame extensions to the protection unit angle iron located at the bottom of the unit. Pay particular attention to position the frame extension marked "left front corner" to the left front corner of the protection unit angle iron. The flange on this frame extension has four holes, the others have two holes.

Because the brake master cylinder on some Jeeps prevents mounting the left front frame extension, some alteration to the mounting flange may be necessary. Only two bolts are needed and the installer can decide which are the most effective and convenient.

On the M38A1, before the front left frame extension is located, the left rear frame extension must be positioned up against the gas tank and 1/2 inch up from the bottom of the Jeep frame. This rear left frame extension is the key to positioning the entire protection unit. Locate, drill and bolt all four frame extensions to the Jeep frame. Leave all bolts loose until all parts are positioned and then tighten them for a permanent installation.

The 1-inch pipes that rest on the rear bumper should now be positioned to fit the bumper so that they are symmetrical on both ends of the rear bumper. The front, 1-inch pipe should also fit the front bumper extension. Some adjustment in the length and shape of the front pipes may be necessary. When all parts are positioned, weld protection unit to front and rear bumpers.

Step #4 - Brush Grill - Place the two grill attaching angles on the end extensions of the grill. Place the fine particle screen in place and position entire unit on the Jeep so that the foam rubber seals against the face of the Jeep's radiator grill.

On Jeeps that this brush grill is intended to fit, there will be two tapped holes on each frame. Use these tapped holes to attach brush grill. Adjustment of the brush grill is made possible by the slots in the attaching angles. The fine particle screen is intended to seal against the face of the Jeep radiator grill to prevent debris from entering around the sides. If the brush grill cannot be installed as described, use the two side plates provided. Holes must be drilled and tapped in the side of the Jeep frame to attach plates.

Two holes must be drilled or torch cut in the top flange of the Jeep's front bumper to receive the grill braces. The length of these braces are adjustable and should be adjusted to hold the brush grill snugly against the radiator grill. Refer to Drawing No. 0-392, Detail No. 8.

Step #5 - Water Tank Mounting - A hole must be cut in the rear deck of the Jeep to provide clearance for the tank's sump. This hole should be 5-1/2" in diameter and located as per supplied instructions. (See attached sketch.) On some units the exhaust system directly beneath the sump must be slightly repositioned to provide the necessary clearance.

The water tank is positioned between two pipes that are a part of the protection unit. Four "J"-bolts are used to anchor the tank to these pipes.

Two 3/4" x 3" x 20" boards are placed under the tank for ventilation and must be used to insure the proper fit of the J-bolts.

Step #6 - Pump Assembly - The pump assembly sets on top of the tank between the two angle irons that are attached to the tank. Pump assembly is secured to the tank by inserting two quick-release pins through the attaching angles and into holes in each end of the pump assembly base.

The 3/4" intake hose connects to the elbow on top of the tank that is located nearest to the front of the Jeep. This elbow is located directly over the tank sump. The hose will assume the shape of the 180° bend.

Connect the hose from the pressure relief valve to the other elbow on top of the tank.

Connect the 1/2" pressure line (about 40" long) to the double valve assembly that is to be mounted between the driver's and passenger's seat. The valve assembly is secured in place with two U-bolts.

The discharge hose and gun are connected to the remaining pressure outlet.

Step #7 - Discharge Gun Holder - Aluminum tube 2" O.D. x 15" long. Locate this tube in a vertical position at the left rear corner of the Jeep and behind the water tank.

Drill two holes through the sheet metal to match mounting holes in tube. Use bolts to attach.

Step #8 - Steering Stabilizer - A hydraulic steering stabilizer is desirable. They can be obtained from Warshawsky & Co., 1924 South State Street, P. O. Box 8440A, Chicago, Illinois 60680, or J. G. Whitney & Co., 1917-19 Archer Avenue, P. O. Box 8410, Chicago, Illinois 60680. Cost is about \$10.00. Specify the Jeep model number when ordering. Installation instructions are supplied with the unit.

Step #9 - Steering Linkage Guard - This should be attached to the inside faces of the Jeep's frame. The M38A1 has two tapped holes on each side that are utilized to attach the guard. The guard is about 3/4" narrower than the distance between the frame to facilitate mounting. Washers should be used as spacers to firmly attach the guard to the Jeep frame.

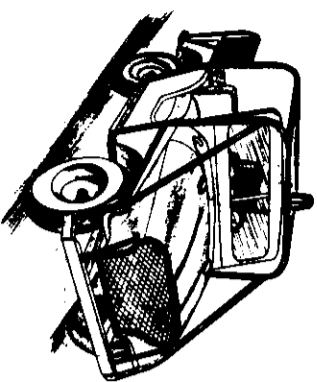
Step #10 - Turn Signals and Work Light - Purchase a turn signal control kit and four lamps. The amber lamps go on the front and red lamps to the rear.

To install the lamps to the front of the Jeep, remove the small military lamps located in holes in the radiator grill, near the bottom. The two amber lamps are mounted in these holes.

To install the red lamps at the rear of the Jeep, two 3" diameter holes must be cut in the sheet metal just above the tail lights. Lamps mount in these holes.

Use the wiring diagram supplied with the control unit.

A fused terminal block should be secured to the fire wall of the Jeep, under the hood. The turn signal lamps and the work lights are 12-volt. Connect a supply from the positive terminal of the battery nearest the ground connection. This will supply 12-volts, sufficient for light load, and will operate the turn signal lights.

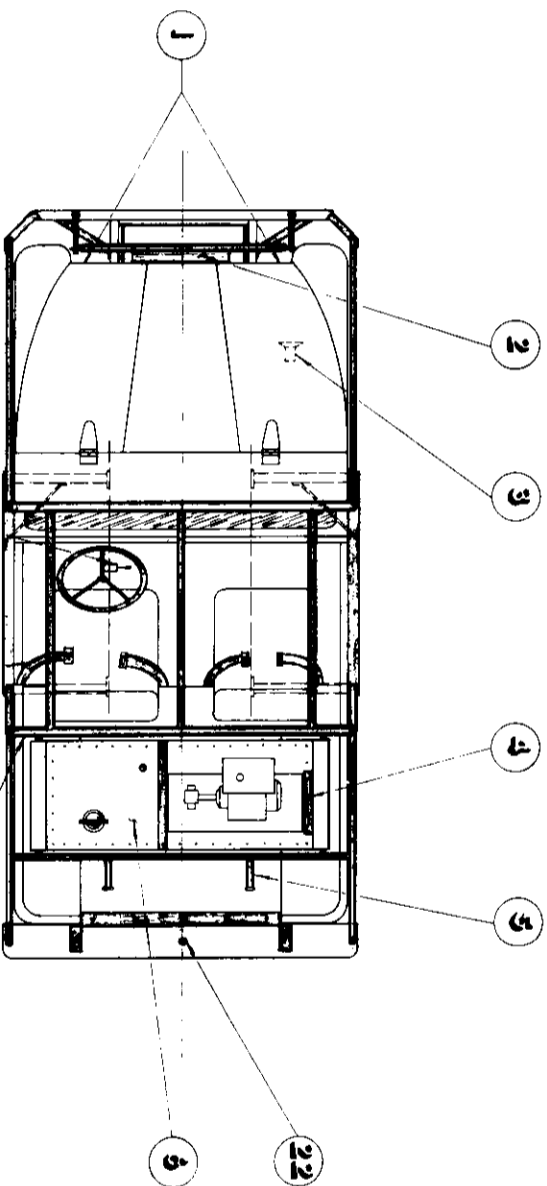
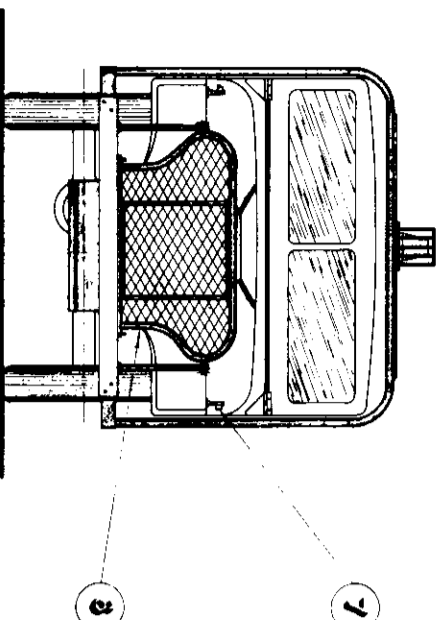


PERSPECTIVE VIEW

A MILITARY JEEP MODEL M-38A1, 1/4 TON, 4x4 UTILITY TRUCK, FULLY EQUIPPED WITH THE R.E.C.'S 66-GAL. TANK, PUMPING SYSTEM AND BRUSH PROTECTION UNIT.

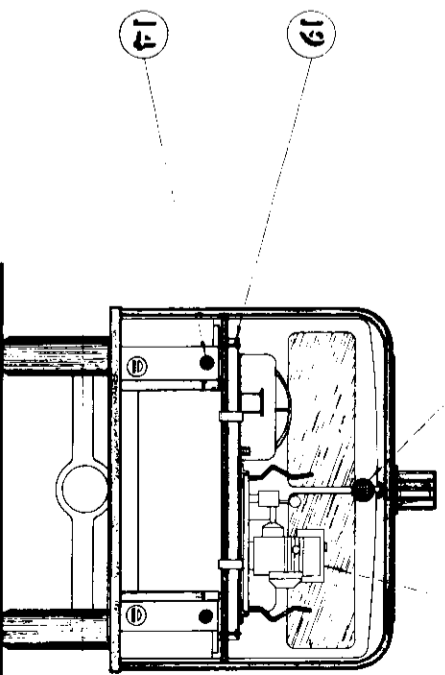
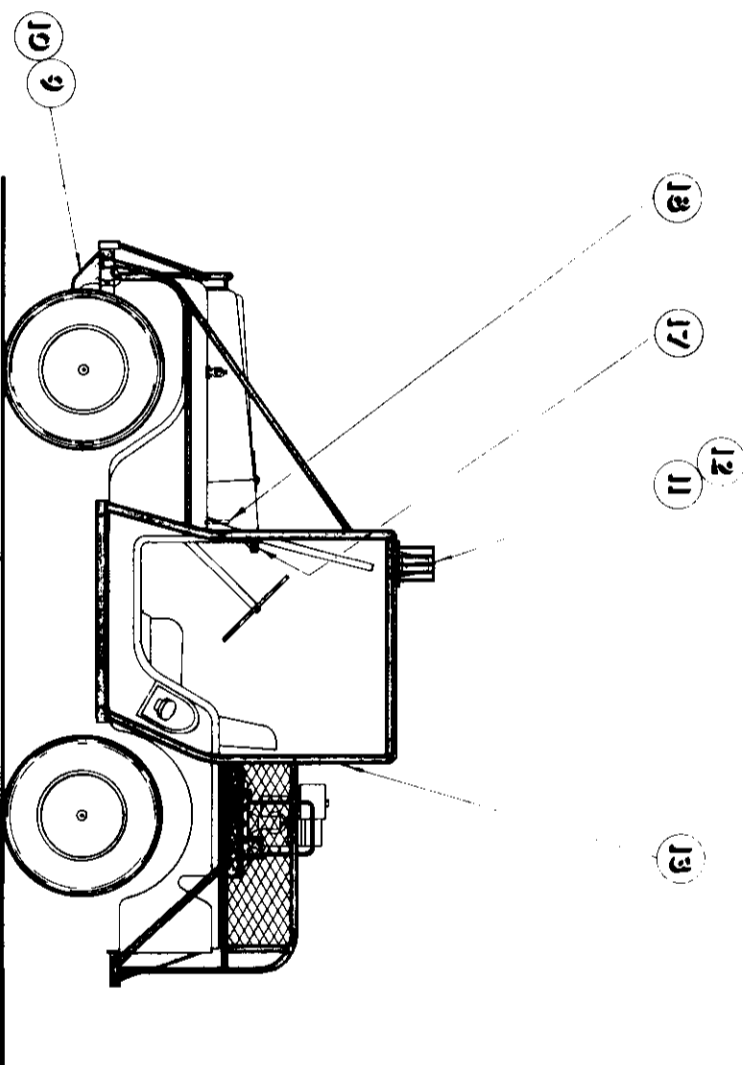
NOTE:
ACCESSORIES WIRING DIAGRAM-----PRINT #0-385
PLUMBING DIAGRAM-----PRINT #0-421

| ORDER NO. | COMPLETE DRAWING INDEX (IN ORDER LISTED) | PRINT |
|-----------|---|-------|
| 1 | JEEP 66-GALLON PUMPER ASSEMBLY | 0-385 |
| 2 | OPERATOR & EQUIPMENT GUARD ASSEMBLY | 0-386 |
| 3 | OPERATOR GUARD DETAILS: 5, 17, 18 & 22 | 0-387 |
| 4 | OPERATOR GUARD DETAILS: 6 & 16 | 0-388 |
| 5 | OPERATOR GUARD DETAILS: 10, 11, 12 & 13 | 0-389 |
| 6 | OPERATOR GUARD DETAILS: 2, 3, 4, 7, 8, 9 & 14 | 0-390 |
| 7 | OPERATOR GUARD DETAILS: 1 & 15 | 0-391 |
| 8 | GRILL GUARD DETAILS | 0-392 |
| 9 | PUMPER UNIT PART #'S: 2, 5 & 11 | 0-393 |
| 10 | 66-GALLON WATER TANK DETAILS | 0-394 |
| 11 | ACCES. WIRING DIAG. & PUMP MFG. ANGLES | 0-395 |
| 12 | SPRAY NOZZLE DETAILS | 0-479 |
| 13 | SUPPLEMENTARY DETAIL SHEET # 1 | 0-419 |
| 14 | REVISED PLUMBING ASSEMBLY | 0-421 |



NOTE:
THE TOP VIEW, IS DRAWN WITH CAB TOP PLATE REMOVED TO SHOW INTERIOR CONSTRUCTION.

| NO. REQD | DESCRIPTION OR TITLE | PRINT |
|----------|---|------------|
| 1 | 2 FRONT TURN SIGNALS (AMBER) | PUR. 0-393 |
| 2 | 1 FINE PARTICLE SCREEN | PUR. 0-393 |
| 3 | 1 SIREN | PUR. 0-393 |
| 4 | 2 PUMP MOUNTING ANGLES | 0-395 |
| 5 | 2 HOSE HANGERS | 0-393 |
| 6 | WATER TANK DETAILS | 0-394 |
| 7 | 2 SPRAY NOZZLE FIXTURES | 0-479 |
| 8 | GRILL GUARD DETAILS | 0-392 |
| 9 | 1 STEERING LINKAGE GUARD | 0-391 |
| 10 | 1 HYDRAULIC STEERING STABILIZER | PUR. 0-393 |
| 11 | 1 EMERGENCY BEACON GUARD | PUR. 0-393 |
| 12 | 1 EMERGENCY BEACON | PUR. 0-386 |
| 13 | 1 JEEP OPERATOR & EQUIPMENT GUARD | PUR. 0-386 |
| 14 | 2 REAR TURN SIGNALS (RED) | PUR. 0-393 |
| 15 | 1 REAR WORK LIGHT | PUR. 0-393 |
| 16 | 1 AROSPRAYER PUMP UNIT | PUR. 0-393 |
| 17 | 1 GRADE & TILT INDICATOR | PUR. 0-393 |
| 18 | 1 TERMINAL BLOCK & ACCESS. WIRING DIAGRAM | 0-395 |
| 19 | 4 J-BOLTS | 0-394 |
| 20 | 1 TURN SIGNAL CONTROL | PUR. 0-394 |
| 21 | 1 SEAT BELTS | PUR. 0-394 |
| 22 | 1 TRAILER HITCH BALL | PUR. 0-394 |



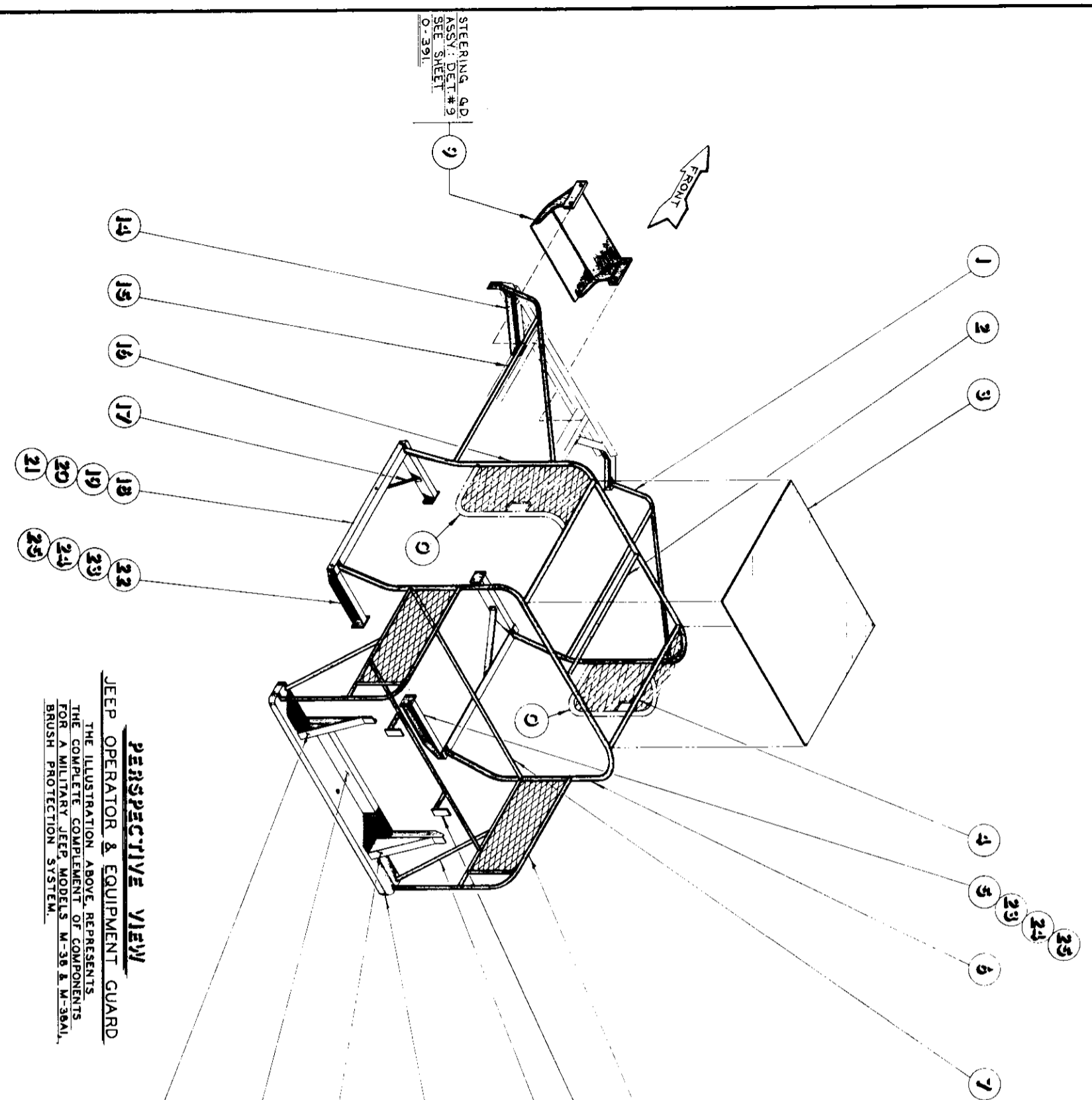
R.E.C. JEEP 66 GAL. PUMPER UNIT

AS DESIGNED UNDER THE ROSCOMMON EQUIPMENT CENTER PROGRAM - PROJECT NO.-4, FOR SPECIFIC USE ON MILITARY JEEP MODELS, M-38 & M-38A1, 1/4 TON 4x4 UTILITY TRUCKS.
FOR USE OF THIS DESIGN TO ACCOMMODATE ANY GIVEN MODEL OF VEHICLE, OTHER THAN THE ABOVE, ALTERATIONS WILL HAVE TO BE MADE.

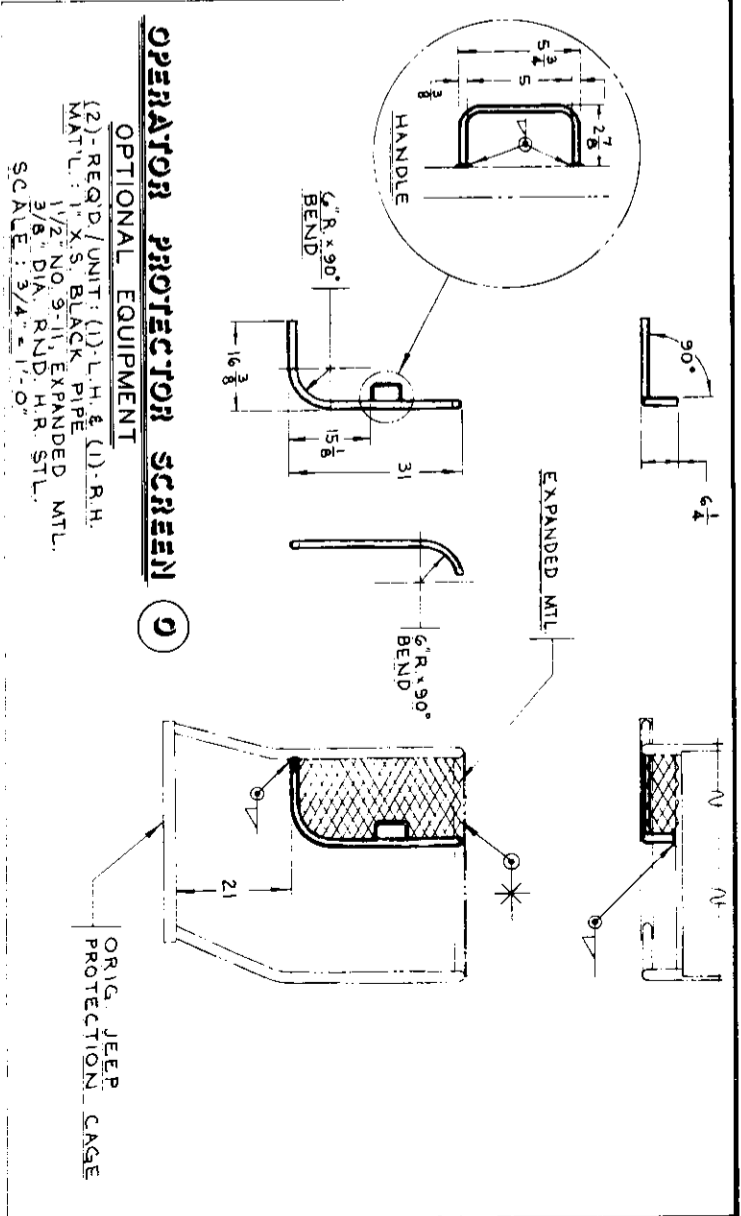
ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS

JEEP R.E.C. 66 GAL. PUMPER UNIT ASSEMBLY

| | |
|---------------------------|--------------------------|
| PROJECT NO. 4 | DATE TRACED BY: 5-8-72 |
| SCALE: 3/4" = 1'-0" | DATE CHECKED BY: 5-12-72 |
| DESIGNED BY: M.A. BRADLEY | APPROVED BY: [Signature] |
| DRAWN BY: [Signature] | |



PERSPECTIVE VIEW
JEOP OPERATOR & EQUIPMENT GUARD
 THE ILLUSTRATION ABOVE REPRESENTS
 THE COMPLETE COMPLEMENT OF COMPONENTS
 FOR A MILITARY JEOP, MODELS M-38 & M-38A1,
 BRUSH PROTECTION SYSTEM.



HOSE HANGERS,
 ASSY: DETAIL # 5
 SEE SHEET 0-393.

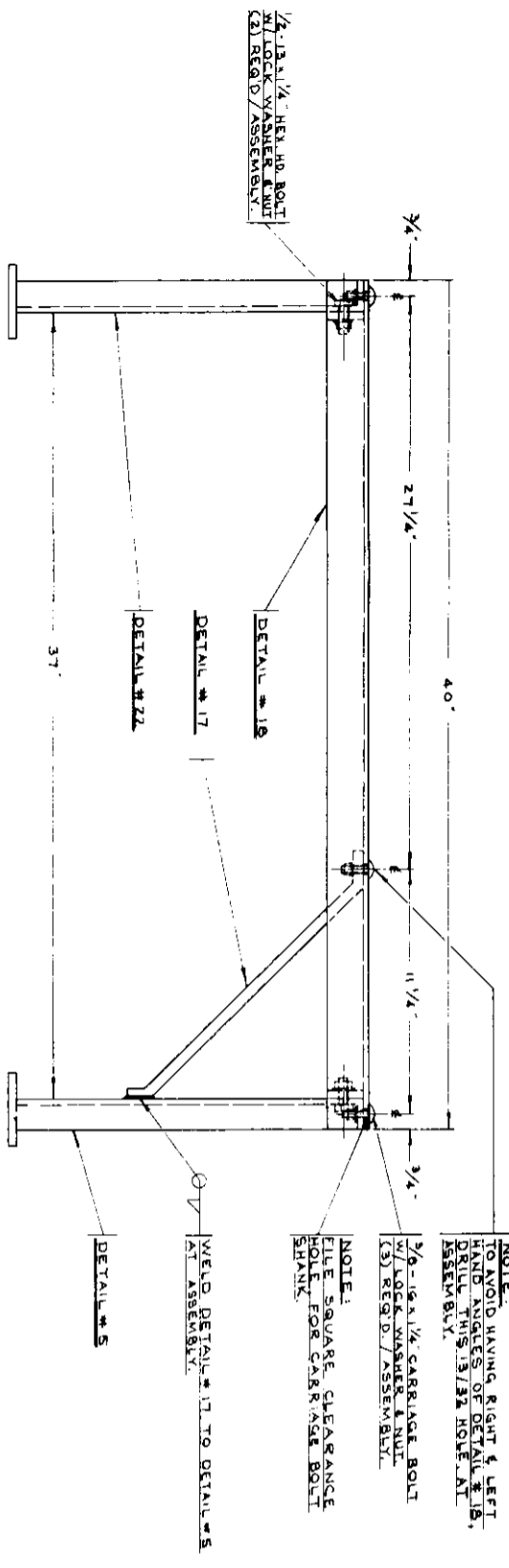
PROJECT NO. 4

| QTY | DESCRIPTION OR TITLE | PRINT |
|-----|---|-------|
| 2 | OPERATOR PROTECTOR SCREEN (OPTIONAL) | 0-386 |
| 4 | 1/2"-13 HEX. NUT | PUR |
| 4 | 1/2" LOCK WASHER | PUR |
| 25 | 1/2"-13x1/4" HEX. HD. BOLT | PUR |
| 2 | FRAME ATTACHMENT (RIGHT HAND) | 0-387 |
| 6 | 3/8"-16 HEX. NUT | PUR |
| 6 | 3/8" LOCK WASHER | PUR |
| 6 | 3/8"-16 x 1 1/2" CARRIAGE BOLT | PUR |
| 2 | JEOP SIDE BRACE: 2" x 2" x 1/4" ANGLE | 0-387 |
| 17 | FRAME ATTACHMENT CORNER BRACE 1/2" x 1/2" FLT. STL. | 0-387 |
| 16 | OPERATOR PROTECTION CAB (FRONT LEG) 1/4" x 3/8" P. | 0-388 |
| 19 | FRONT SIDE BRACE REIN. RAIL: 1" x 3" BLK. PIPE | 0-391 |
| 14 | FRONT BUMPER EXT. & BRACE 3" x 5" CHANNEL | 0-390 |
| 13 | REAR BUMPER SUPPORT BRKT. (L.H.) 3/16" PLT. STL. | 0-389 |
| 12 | TAILGATE REINFORCING FRAME | 0-389 |
| 11 | REAR BUMPER SUPPORT BRKT. (RH) 3/16" PLT. STL. | 0-389 |
| 10 | REAR BUMPER 6" x 8.2" CHANNEL | 0-389 |
| 9 | REAR PROTECTOR SCREEN SUPPORT: 1" x 3" BLK. PIPE | 0-390 |
| 8 | REAR PROTECTOR SCREEN ASSEMBLY | 0-390 |
| 7 | WATER TANK TIE-DOWN BAR: 1" x 3" BLK. PIPE | 0-390 |
| 6 | OPERATOR PROTECTION CAB (REAR LEG): 1/4" x 3/8" P. | 0-388 |
| 5 | FRAME ATTACHMENT (LEFT HAND) | 0-387 |
| 4 | CAB (OUTSIDE REIN. RAIL) 1/4" x 3" S. BLACK PIPE | 0-390 |
| 3 | CAB TOP PLATE: 1/4" GA. HOT ROLLED SH. STL. | 0-390 |
| 2 | CAB (CENTER REIN. RAIL) 1" x 3" S. BLACK PIPE | 0-390 |
| 1 | FRONT SIDE BRACE: 1" x 3" S. BLACK PIPE | 0-391 |

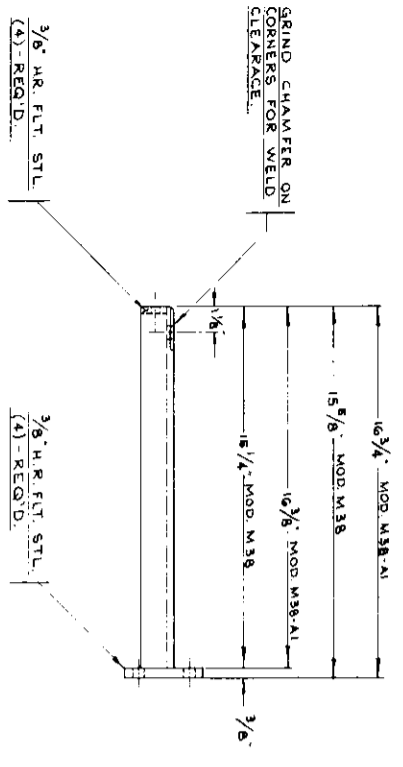
ROSCOMMON EQUIPMENT CENTER
 NORTHEAST FOREST FIRE SUPERVISORS

JEOP OPERATOR & EQUIPMENT GUARD

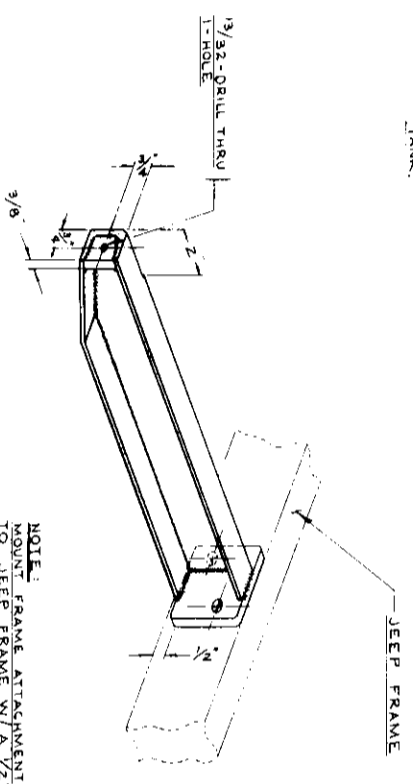
SCALE: 3/4" = 1'-0"
 DESIGNED BY: M.A. BRADLEY
 DRAWN BY: G. BRADLEY
 DATE: 1-4-72
 TRACED BY: J. BRADLEY
 CHECKED BY: J. BRADLEY
 APPROVED BY: J. BRADLEY
 DATE: 5-8-72
 DATE: 6-2-72



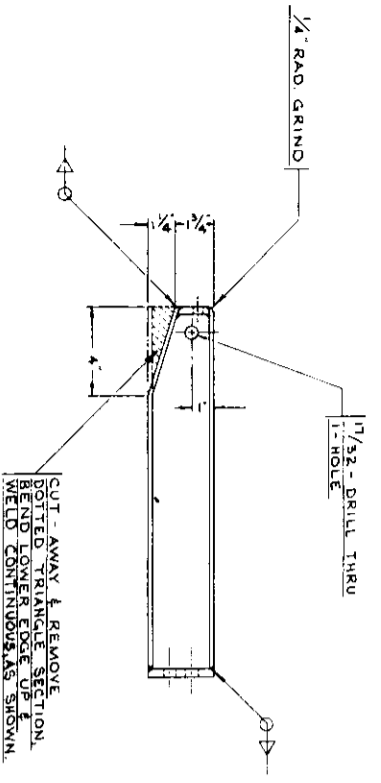
ASSEMBLY VIEW OF DETAILS 5, 17, 18 & 22



NOTE:
FOR MODEL M38-A1 LOCATE
TOP FLANGE AS SHOWN AND
UP TIGHT AGAINST JEEP FUEL
TANK.

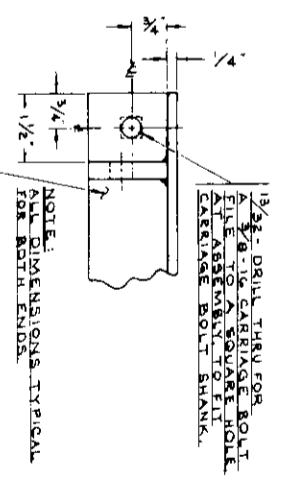


NOTE:
FRAME ATTACHMENT
POINT FROM BOTTOM
OF FRAME AS SHOWN

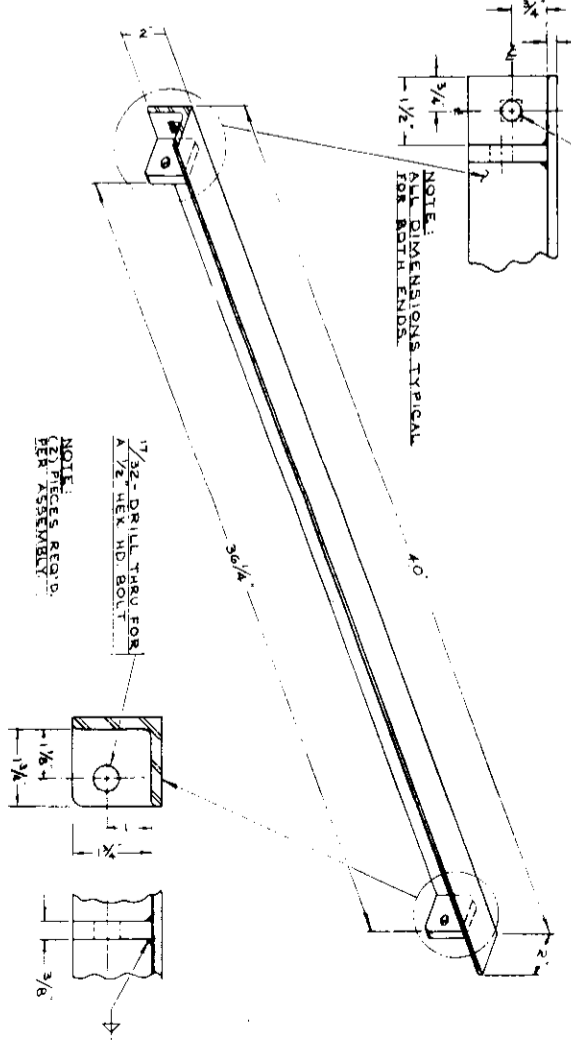


5 22

DETAILS 5 & 22
FRAME ATTACHMENT
(1) - REQ'D
(2) - LEFT & (2) - RIGHT
MATERIAL - 3/8\"/>

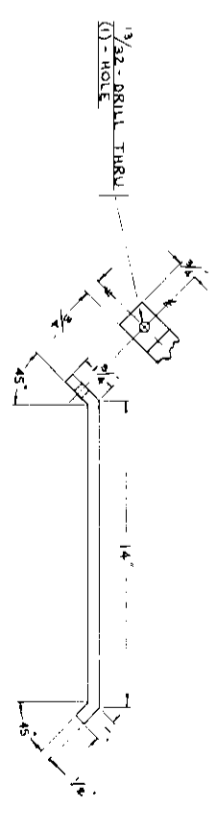


NOTE:
ALL DIMENSIONS TYPICAL
FOR BOTH ENDS.



18

DETAIL #18
JEEP SIDE BRACE
MATERIAL - 3/8\"/>



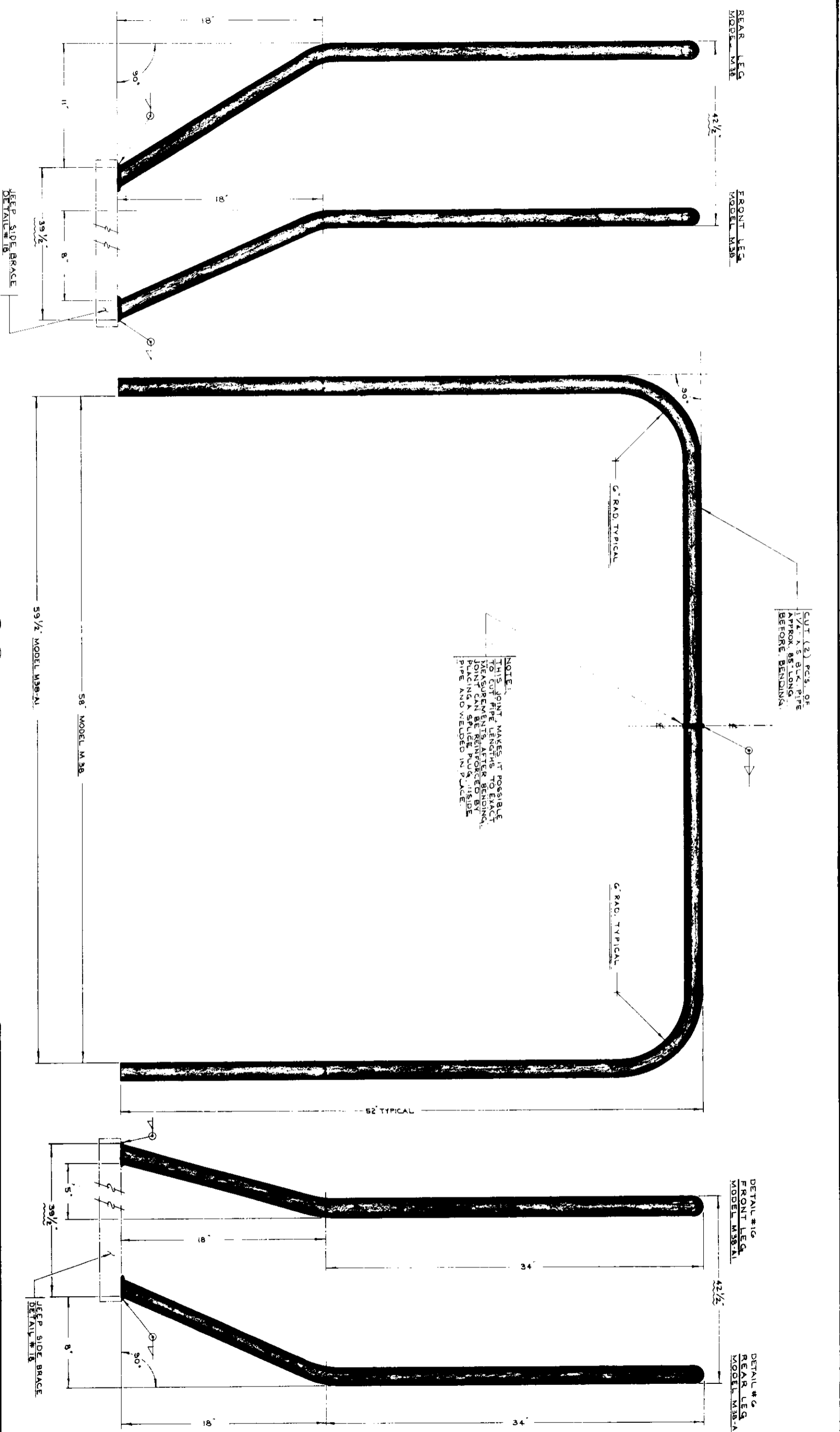
17

DETAIL #17
FRAME ATTACHMENT CORNER BRACE
(2) - REQ'D
MATERIAL - 1/2\"/>

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NORTHEAST FOREST FIRE SUPERVISORS

JEEP GUARD DETAILS: 5, 17, 18 & 22

| | | |
|---------------------------|--------------------------|---------------|
| SCALE: 1"=4' | DATE: 11/5/72 | DATE: 5-8-72 |
| DESIGNED BY: M.A. BRADLEY | CHECKED BY: [Signature] | PROJECT NO. 4 |
| DRAWN BY: G. [Signature] | APPROVED BY: [Signature] | |



CUT (2) Pcs. OF
1/4" X 5" S. BLK. PIPE
APPROX. 85" LONG
BEFORE BENDING.

NOTE:
THIS JOINT MAKES IT POSSIBLE
TO REMOVE THE LEGS TO EXACT
FIT SUPPLEMENTS AFTER BENDING.
JOINT CAN BE REINFORCED BY
PLACING A SPLICE PLUG INSIDE
PIPE AND WELDED IN PLACE.

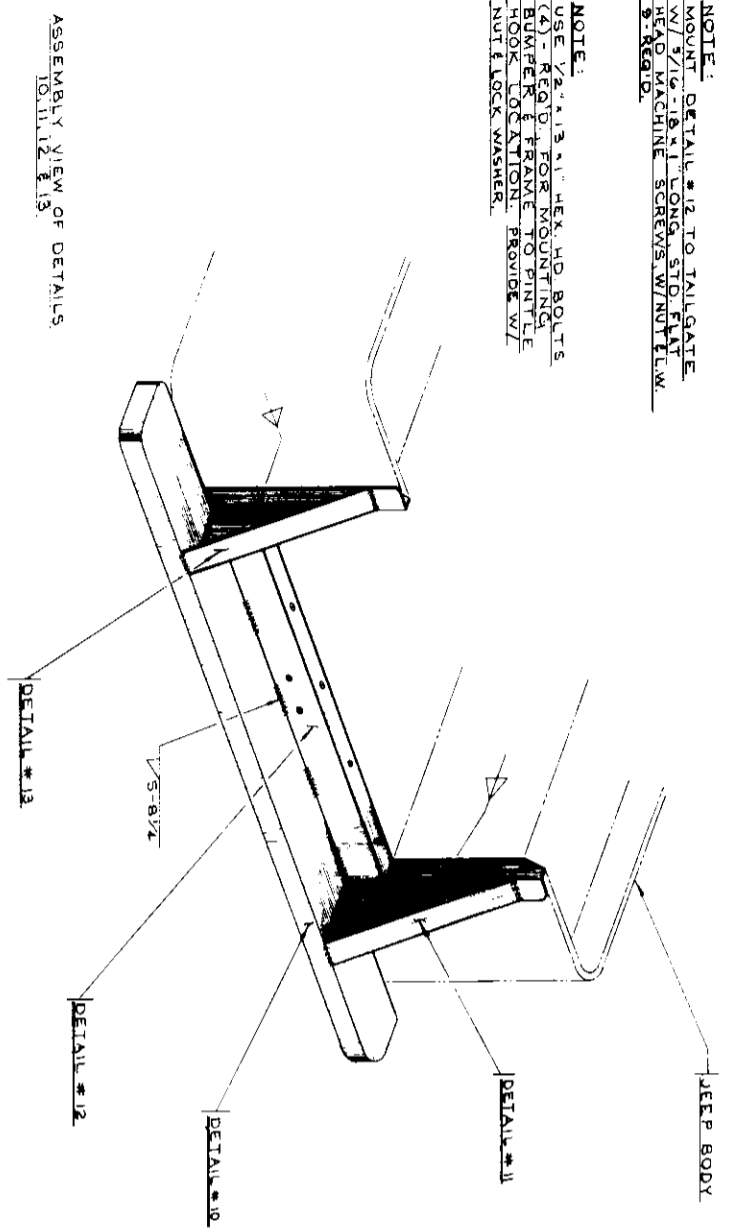
NOTE:
WELD LEGS TO JEEP
SIDE BRACE AT ASSEMBLY.

6 16 DETAILS 6 & 16
OPERATOR PROTECTION CAB:
FRONT & REAR LEGS
CUT REAR LEGS AT ASSEMBLY
CUT REAR LEGS AT ASSEMBLY
FOR ASSEMBLY SEE SHEET # O-384.

| | |
|-----------------------------------|---------------|
| HOSCOMMON EQUIPMENT CENTER | |
| NORTHEAST FOREST FIRE SUPERVISORS | |
| JEEP GUARD DETAILS: 6 & 16 | |
| SCALE: 1" = 4" | DATE |
| DESIGNED BY: M.A. BRADLEY | TRACED BY: |
| DRAWN BY: G. L. BRADLEY | CHECKED BY: |
| | APPROVED BY: |
| | DATE |
| | PROJECT NO. 4 |

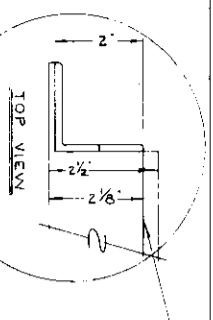
NOTE: DETAIL #12 TO TAILGATE MOUNT W/ 3/16" DIA. X 1" LONG STD FLAT HEAD MACHINE SCREWS W/ NUTS & LOCK WASHER.

NOTE: USE 1/2" DIA. X 1 1/2" HEX. HD. BOLTS (4) - REQ'D FOR MOUNTING BUMPER & FRAME TO PINTLE HOOK LOCATION. PROVIDE W/ NUTS & LOCK WASHER.



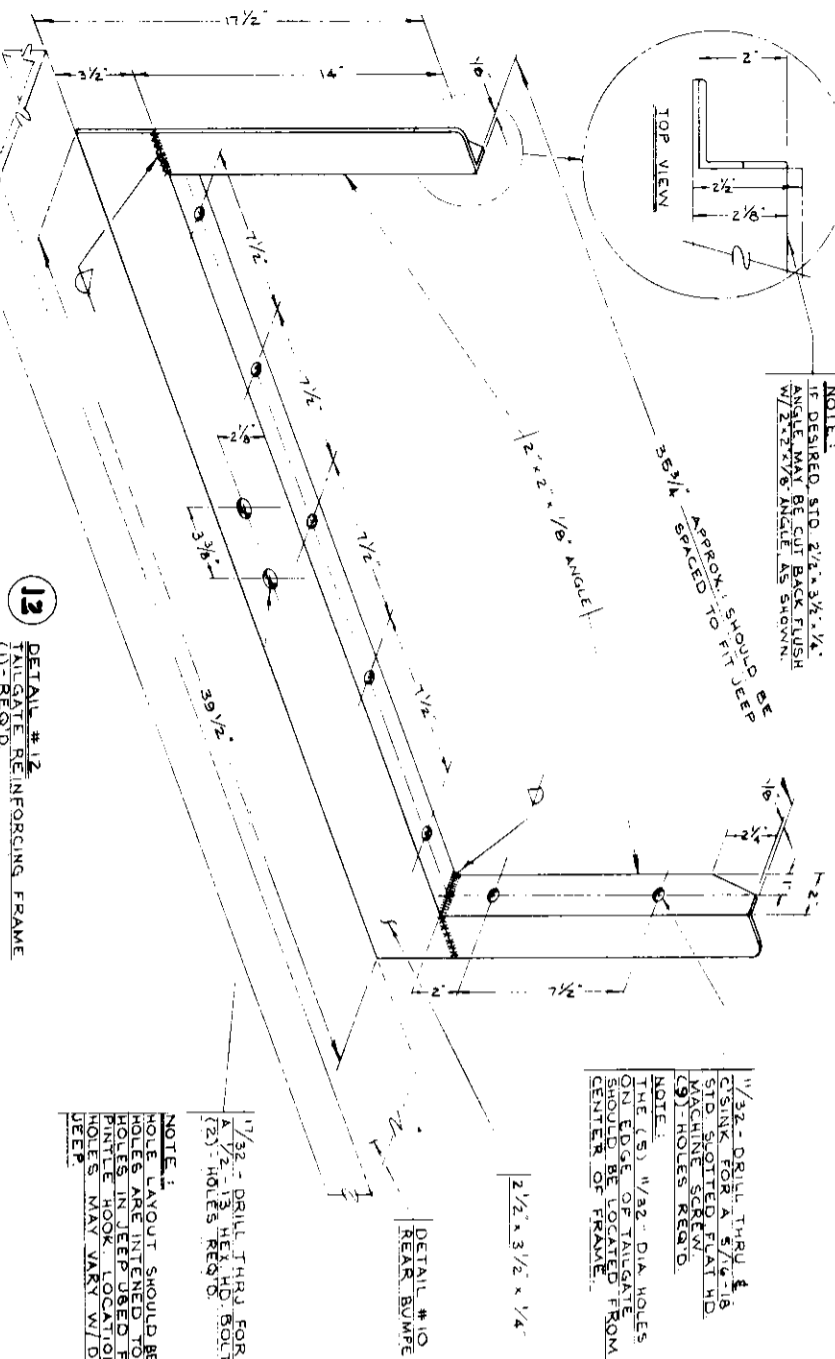
ASSEMBLY VIEW OF DETAILS 10, 11, 12 & 13.

NOTE: IF DESIRED, STD. 2 1/2" X 3 1/2" X 1/4" ANGLE MAY BE CUT BACK FLUSH W/ 2 1/2" X 3 1/2" ANGLE AS SHOWN.



NOTE: 1 1/2" - DRILL THRU & SINK FOR A 5/16" DIA. STD. SLOTTED FLAT HD. MACHINE SCREWS (2) - HOLES REQ'D.

NOTE: THE (S) 1/4" DIA. HOLES ON THE EDGE OF TAILGATE ARE LOCATED FROM CENTER OF FRAME.



REAR BUMPER DETAIL #10

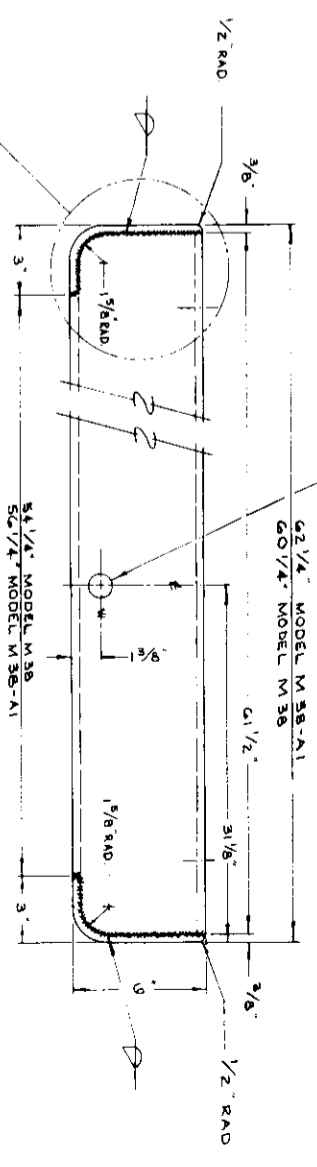
NOTE: 1 7/8" - DRILL THRU FOR (2) - HOLES HEAD TO BOLT.

NOTE: HOLE LAYOUT SHOULD BE CHECKED; HOLES ARE INTENDED TO MATCH HOLES IN JEEP BODY FOR BUMPER HOOK LOCATION OF JEEP. MAT. VARY W/ DIFFERENT JEEPS.

12

DETAIL #12
TAILGATE REINFORCING FRAME
(1) - REQ'D.
MATERIAL: 2" X 2" X 1/8" & 2 1/2" X 3 1/2" X 1/4" ANGLE
FOR FULL GUARD ASS'Y. SEE SHEET # 0-386.

1 1/4" - DRILL THRU FOR 3/16" DIA. TRAILER HITCH BOLT.



SAW CUT TO SHAPE AS SHOWN

NOTE: THIS LOWER EXTENSION IS TO BE BENT TO FIT THE TRAILER HITCH. WELD TO USE ALL (4) PINTLE HOOK MTS. NOTES. MATERIAL: 1/2" FLT. STL.

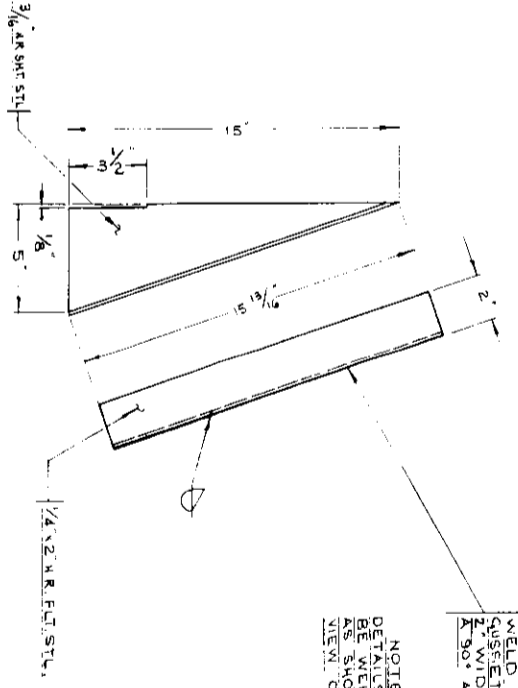
NOTE: UNDERLINED DIMENSIONS ARE ONLY APPROXIMATE LOCATIONS; DIMENSIONS MAY VARY TO SUIT EACH JEEP.

BEND TO FIT & WELD TO TRAILER HITCH AS SHOWN IN TOP VIEW.

NOTE: LOCATE & DRILL WELDING HOLES IN JEEP REAR CROSS MEMBER, AT ASSEMBLY.

10

DETAIL #10
REAR BUMPER
(1) - REQ'D.
MATERIAL: 5" X 8" 2 LB. CHANNEL
FOR FULL GUARD ASS'Y.
SEE SHEET # 0-386.



WELD TRIANGULAR SHAPED, SANDING & SCRIBING TO UNDERSIDE OF BUMPER. WELD TO UNDER SIDE OF BUMPER. WELD TO FORM A 90° ANGLE.

NOTE: DETAILS #11 & 12 ARE TO BE WELDED IN PLACE AS SHOWN IN ASSEMBLY VIEW OF REAR BUMPER.

11

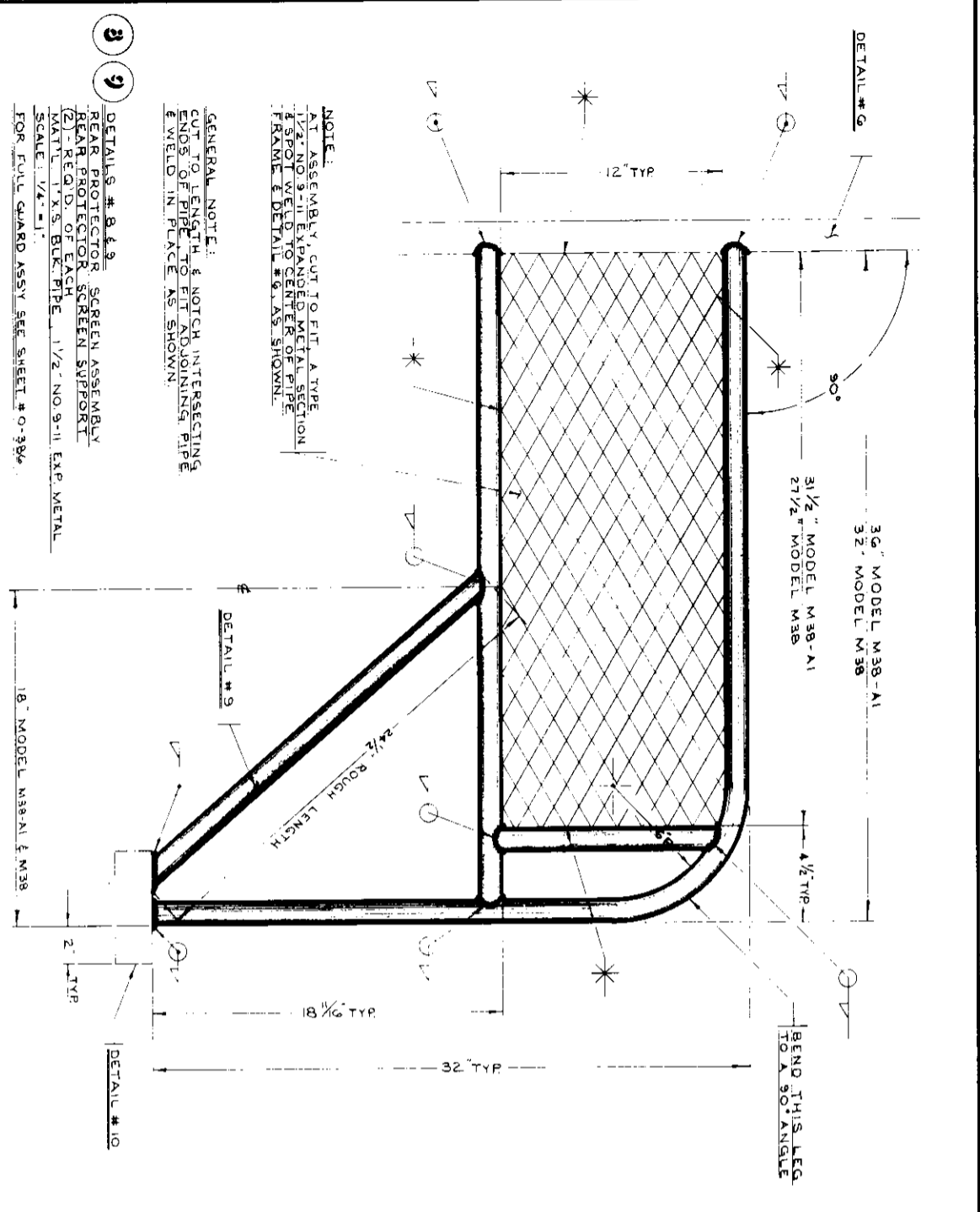
DETAIL #13
REAR BUMPER SUPPORT BRKT (R.H.)
(1) - REQ'D.
MATERIAL: 3/16" HR. SHT. STEEL
1/4" X 2 HR. FLT. STEEL.
SCALE: 1" = 4"

13

DETAIL #13
REAR BUMPER SUPPORT BRKT (L.H.)
(1) - REQ'D.
MATERIAL: 3/16" SHT. STL.
FOR FULL GUARD ASSEMBLY,
SEE SHEET # 0-386.

ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS
JEEP GUARD DETAILS: 10, 11, 12 & 13

| | | | |
|---------------------------|------------------------|-------------------------|-------------------------|
| SCALE: 1" = 4" | DATE: 11-17-72 | TRACED BY: M.A. BRADLEY | DATE: 5-8-72 |
| DESIGNED BY: M.A. BRADLEY | CHECKED BY: G. BRADLEY | DRAWN BY: G. BRADLEY | APPROVED BY: G. BRADLEY |
| PROJECT NO. 4 | | PROJECT NO. 4 | |



NOTE:
 1) ASSEMBLY CUT TO FIT A TYPE
 1 1/2\"/>

GENERAL NOTE:
 CUT TO LENGTH & NOTCH INTERSECTING
 ENDS OF PIPE TO FIT ADJOINING PIPE
 & WELD IN PLACE AS SHOWN.

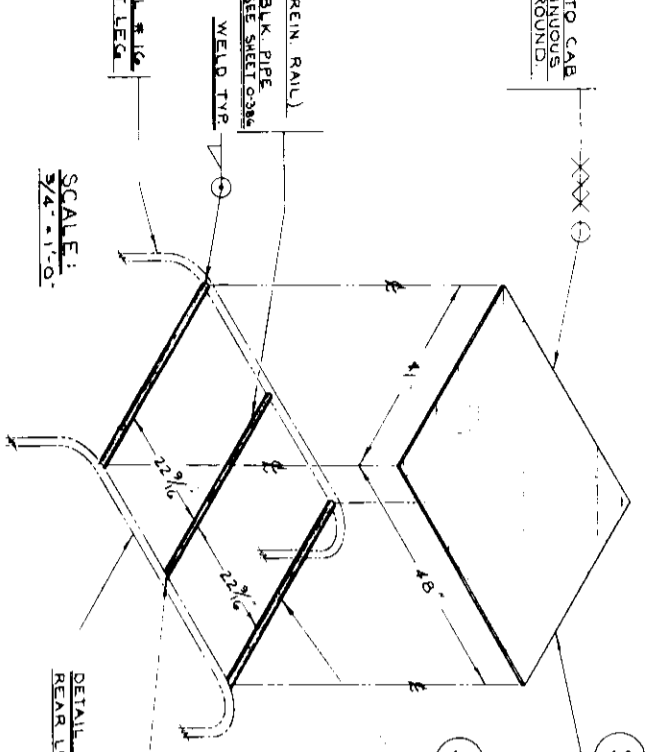
3) DETAILS # 8 & 9
 REAR PROTECTOR SCREEN SUPPORT
 (2) - REQ'D. OF EACH
 MATEL. 1 1/2\"/>

NOTE:
 WELD TOP PLATE TO CAB
 FRAME W/ A CONTINUOUS
 SEAM WELD ALL AROUND.
 GRIND SMOOTH.

2) DETAIL # 2
 CAB (CENTER REIN. RAIL)
 (1) - REQ'D.
 MATEL. 1 1/2\"/>

DETAIL # 10
 FRONT LEG

SCALE:
 3/4\"/>



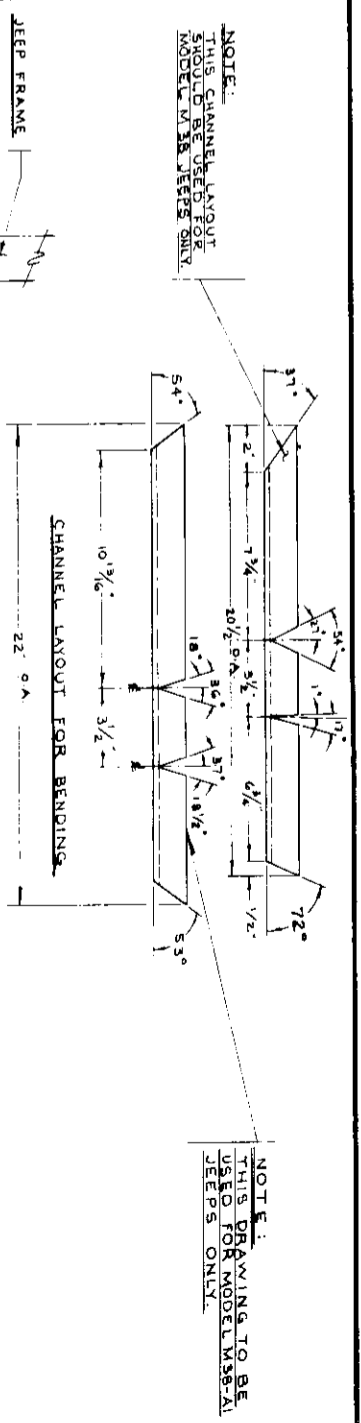
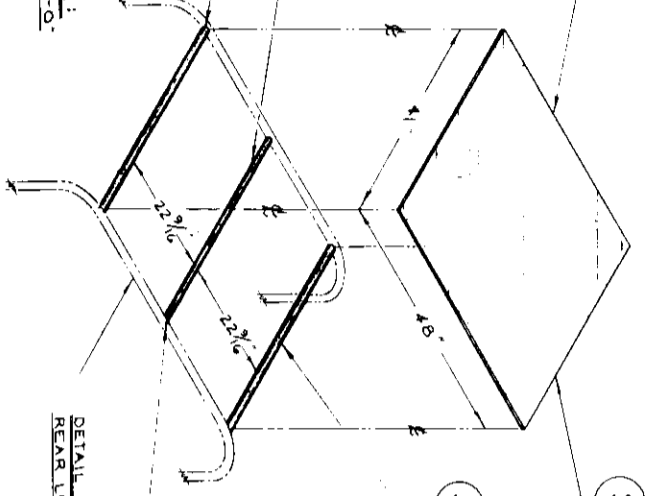
3) DETAIL # 3
 CAB TOP PLATE
 (1) - REQ'D.
 MATEL. # 10, GA. HOT ROLLED PLT. STL.

4) DETAIL # 4
 CAB (OUTSIDE REIN. RAIL)
 (2) - REQ'D.
 MATEL. 1 1/2\"/>

NOTE:
 DETAILS # 2 & 4:
 CUT TO LENGTH (APPROX. 40\"/>

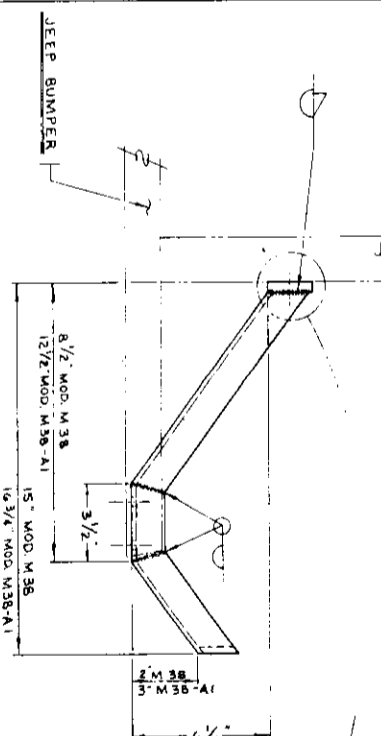
NOTE:
 DETAIL # 2, ON CENTER-
 LINE OF FRONT & REAR LEGS.

DETAIL # 6
 REAR LEG



NOTE:
 THIS CHANNEL IS AN OUT
 MODEL M38-A1. SEE SHEET ONLY.

NOTE:
 THIS DRAWING TO BE
 USED FOR MODEL M38-A1
 JEEPS ONLY.



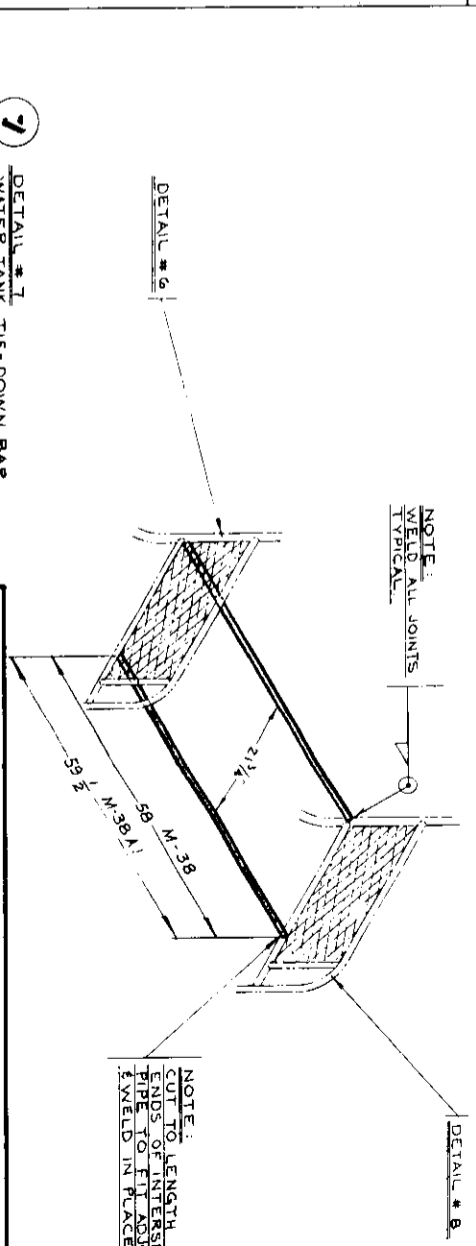
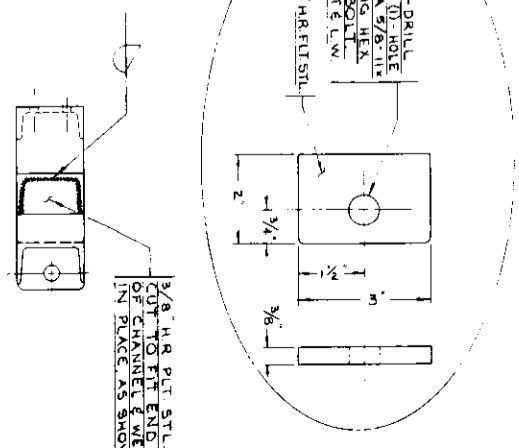
NOTE:
 CLEARANCE FOR
 SQUARE SHANK OF
 CARRIAGE BOLTS

7/32\"/>

14

DETAIL # 14
 FRONT BUMPER EXT. & BRACE
 MODEL M38 SERIES
 (2) - REQ'D.
 MATEL. 3\"/>

3/8\"/>



NOTE:
 WELD ALL JOINTS
 TYPICAL.

NOTE:
 CUT TO LENGTH & NOTCH
 ENDS OF INTERSECTING
 PIPE TO FIT ADJOINING PIPE
 & WELD IN PLACE AS SHOWN.

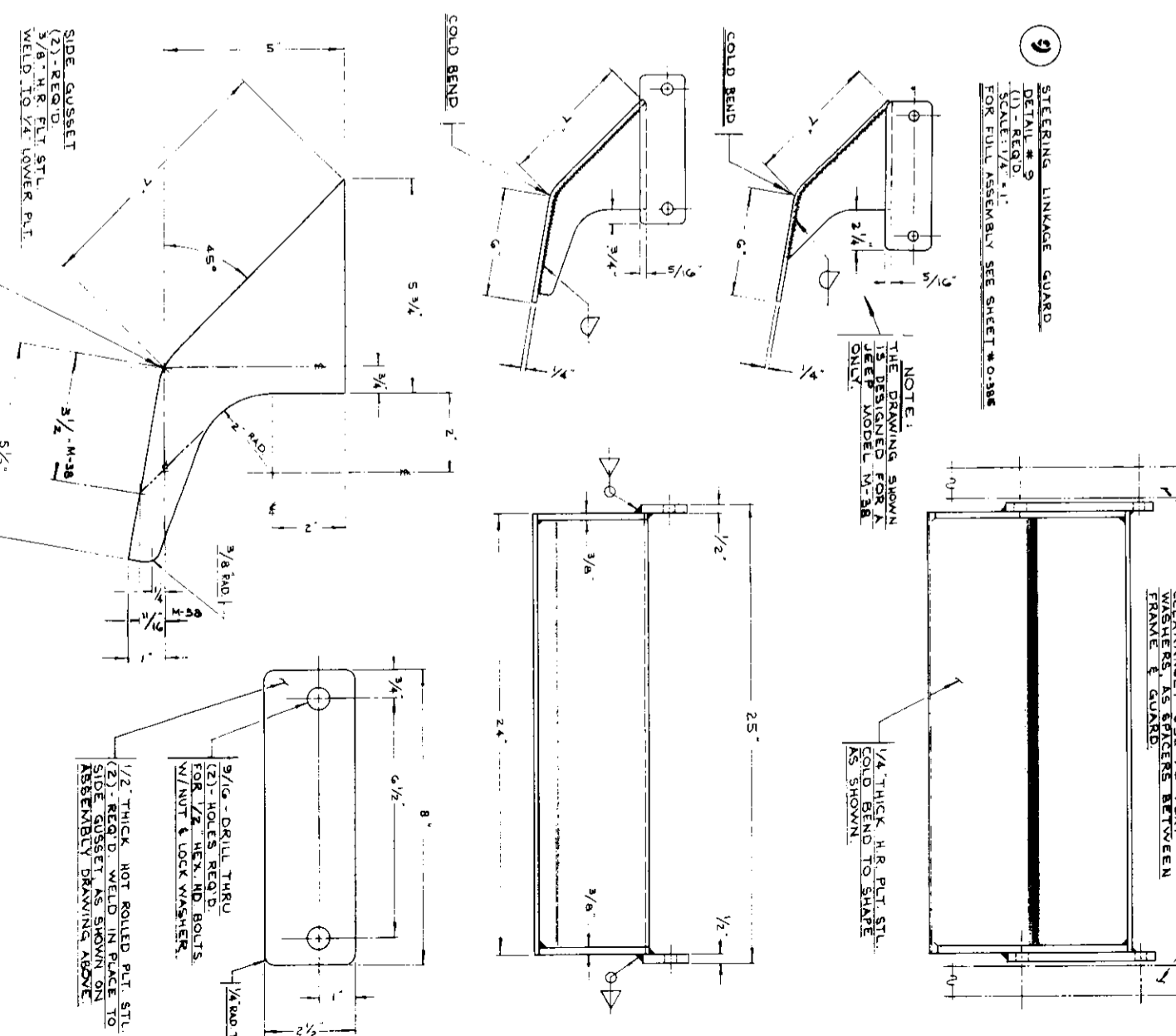
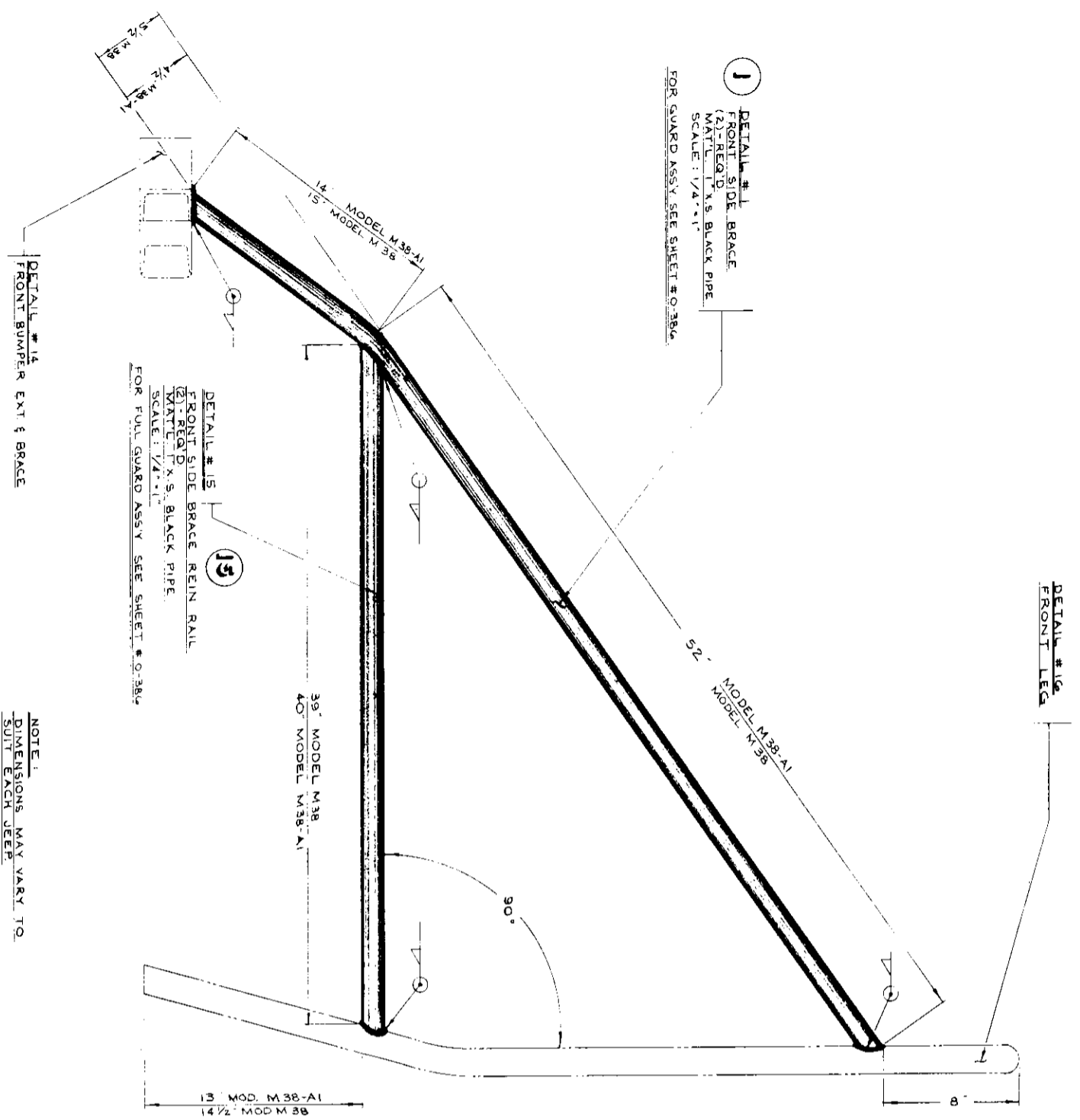
1) DETAIL # 1
 WATER TANK TIE-DOWN BAR
 (2) - REQ'D.
 MATEL. 1 1/2\"/>

SCALE:
 3/4\"/>

ROSCOMMON EQUIPMENT CENTER
 NORTHEAST FOREST FIRE SUPERVISORS

JEEP GUARD DETAILS: 2, 3, 4, 7, 8, 9 & 14

| | | | |
|---------------------------|---------------|--------------------------|---------------|
| SCALE: 3/4\"/> | DATE: 1-15-72 | TRACED BY: [Signature] | DATE: |
| DESIGNED BY: M.A. BRADLEY | 3-6-72 | CHECKED BY: [Signature] | 5-8-72 |
| DRAWN BY: G. [Signature] | 6-12-72 | APPROVED BY: [Signature] | PROJECT NO. 4 |



ROSCOMMON EQUIPMENT CENTER
 NORTHEAST FOREST FIRE SUPERVISORS

JEOP GUARD DETAILS: 1 & 15

| | | |
|---------------------------|--------------|---------------|
| SCALE: 1" = 4" | DATE | DATE |
| DESIGNED BY: M.A. BRADLEY | TRACED BY: | 5-872 |
| DRAWN BY: G. BRYAN | CHECKED BY: | 6-1272 |
| | APPROVED BY: | PROJECT NO. 4 |

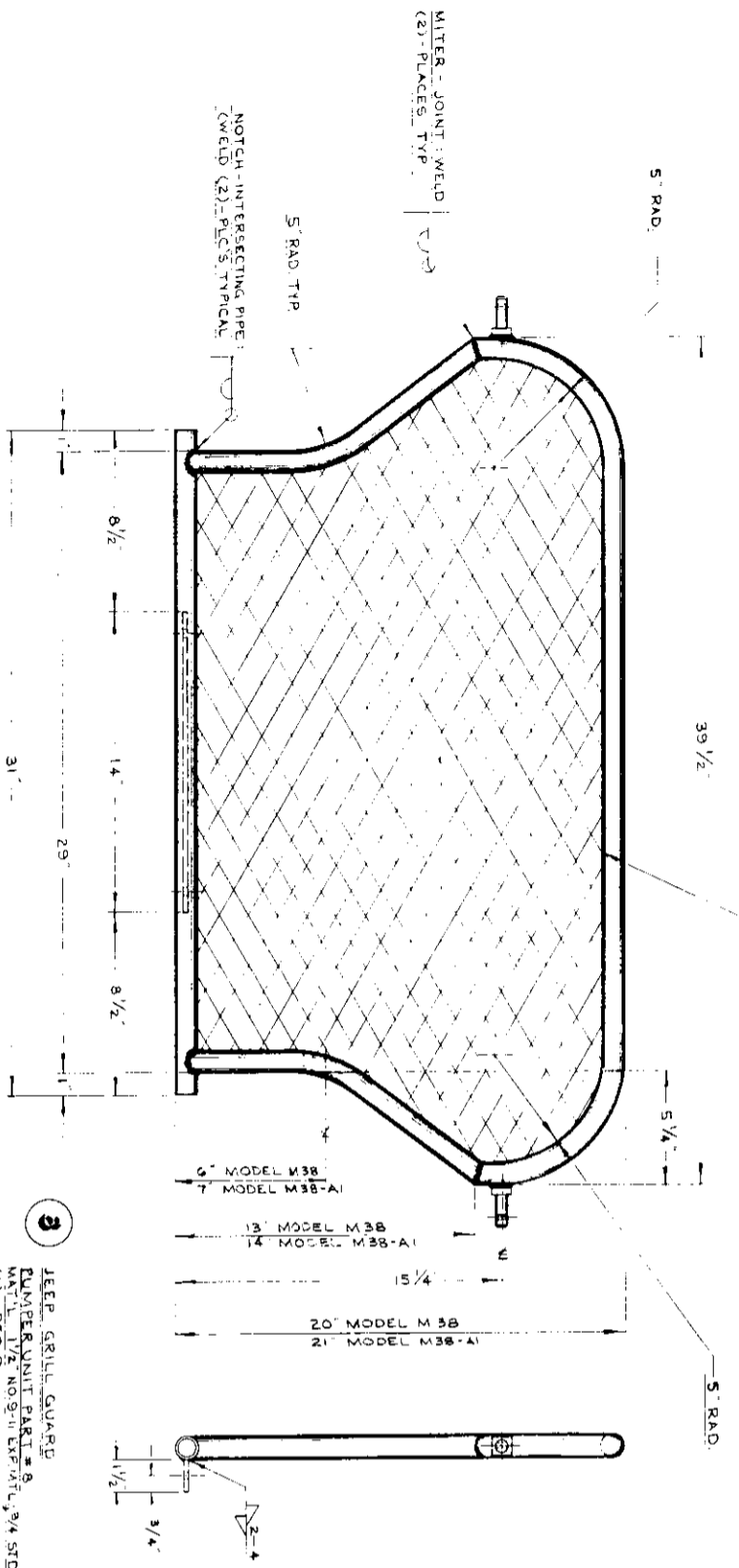
5/8-11.4.3" LONG SQ HD MACHINE BOLT CUT TO LENGTH & WELD IN PLACE AS SHOWN (2) - REQ'D.

NOTE: PROVIDE (2) - 5/32" x 2 3/8" LONG HAIR PIN SLITS W/ BAL DRILL GUARD.

5/16" - DRILL THRU (2) - HOLES TYP

3/16" - DRILL THRU
3/16" FLAT STEEL WELD IN PLACE AS SHOWN

CUT TO FIT QUENY TYPE 1 1/2" NO. 37 EXP. METAL SECTION & SPOT WELD TO CENTER OF PIPE FRAME.



FOR FULL ASSY. SEE SHEET # 0-385

3 JEEP GRILL GUARD BUMPER UNIT PART # 8 MATL: 1/2" NO. 9-11 EXP. METAL 3/4" STD BLK PIPE SCALE: 1/4" = 1"

7/8-14 NF TAP (1) END ONLY FOR LENGTH ADJUSTMENT

THREADED BRACE INTERNAL THREAD

LENGTH ADJUSTMENT

29/32-OR THRU (2) - HOLES TYP
3/8" TYP

GRILL GUARD BRACE MATL: 3/4" STD BLK PIPE 1 7/8" DIA ROD (2) - REQ'D. SCALE: 1/4" = 1"

TOP VIEW OF JEEP BUMPER
4 1/4"
LOCATE FROM E OF BUMPER

1/16" DRILL THRU; CUT FROM STOCK & WELD IN PLACE

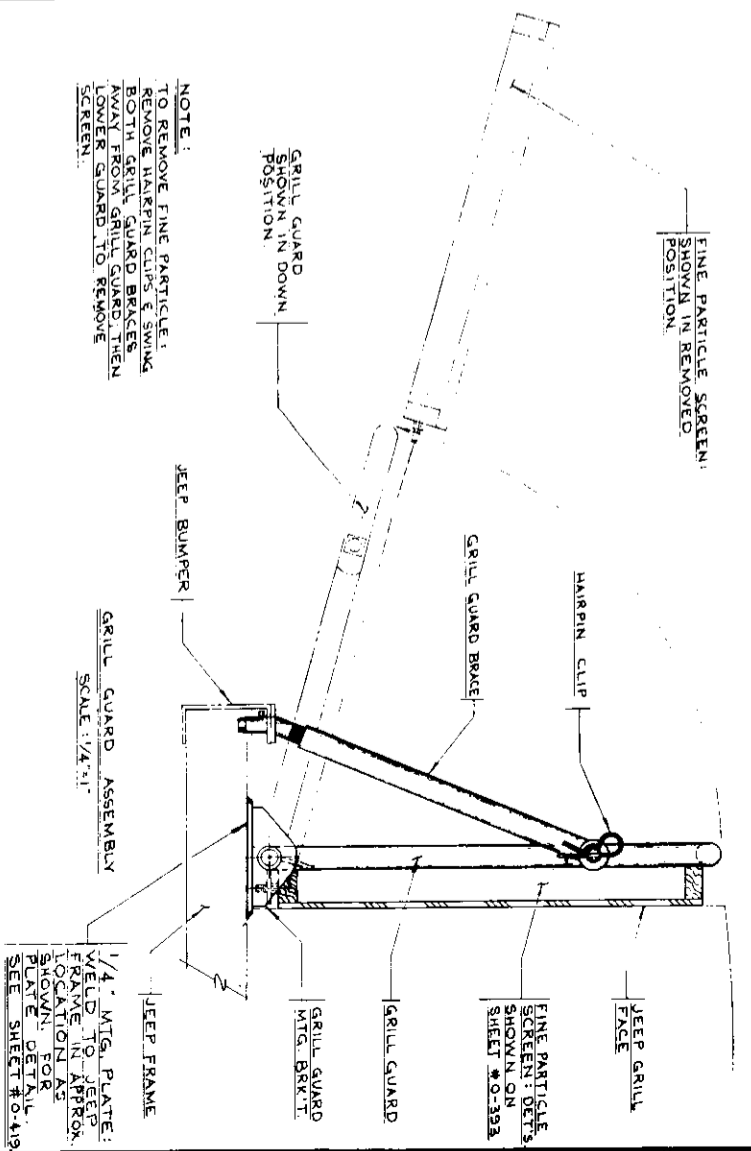
3/4" STD FLAT WASHER; REAM I.D. TO A 15/16" DIA & WELD IN PLACE AT ASSEMBLY.

7/8-14 NF THREAD

2/64" DR THRU FOR A 5/16" DIA X 1" LONG PIN - WELD IN PLACE AS SHOWN

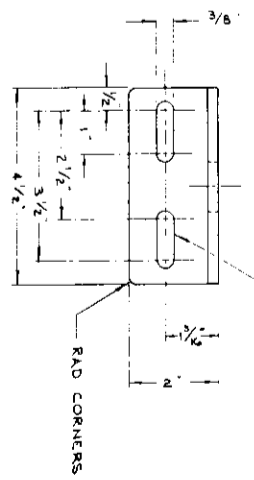
ADJUSTMENT DATA: GRILL GUARD TIGHTNESS AGAINST JEEP GRILL MAY BE ADJUSTED BY TURNING GRILL GUARD BRACES. IN OR OUT. HOWEVERT, ADJUSTMENT OF GRILL GUARD BRACES WILL CHANGE THE GRILL GUARD MTD BRACKET FROM FRONT TO BACK ON JEEP FRAME.

NOTE: TO REMOVE FINE PARTICLE: REMOVE HAIRPIN CLIPS & SWING BOTH GRILL GUARD BRACES AWAY FROM GRILL GUARD THEN LOWER GUARD TO REMOVE SCREEN.



3/8" WIDE, SLOT THRU (2) - REQ'D FOR 1 5/16" - 18 X LONG HEX HD BOLT W/ NUT & LOCK WASHER.

NOTE: BRACKET MOUNTING LOCATIONS ON JEEP ARE SHOWN ON SHEET W/ THE FINE PARTICLE SCREEN DETAILS.



GRILL GUARD MOUNTING BRKT MATL: 2" x 2" x 1/4" ANGLE IRON (2) - REQ'D SCALE: 1/2" = 1"

ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS
JEEP GRILL GUARD DETAIL: 8

| | | |
|---------------------------|-----------------------------|------|
| SCALE: 1/4" = 1" | DATE TRACED BY: [Signature] | DATE |
| DESIGNED BY: M.A. BRADLEY | CHECKED BY: [Signature] | 6/72 |
| DRAWN BY: [Signature] | APPROVED BY: [Signature] | 6/72 |
| PROJECT NO. 4 | | |

NOTE:
AFTER WOOD FRAME IS
CONSTRUCTED, PAINT
FRAME BLACK.

STEEL WIRE CLOTH -
12 G. MESH. 18 WIRE DIA. 1
STAPLE CLOTH TO PERIMETER
EDGE OF WOOD FRAME.

FLAT CORNER BRACE
#2 - 2 STD. (1/2" DIA) REQ'D
USE 1/2" DIA. HEAD WOOD
SCREWS FOR WTS.

1/4" - DRILL THRU (2) HOLES
TYP. LOCATE HOLES FROM
CENTER OF WOOD FRAME.

1/2" THICK x 3/4" WIDE "SELF
CUSHION" TYPE FOAM RUBBER
PUSHION. INTERMITTENT STAPLE
OVER SCREEN TO WOOD FRAME.

3/4" THICK x 1/2" WIDE WOOD
FRAME. FASTEN TOGETHER
W/ #10 NAILS.

2
FINE PARTICLE SCREEN
PUMPER UNIT PART # 2
(1) - REQ'D.
SCALE: 1/4" = 1"
FOR FULL ASSY. SEE SHEET # 0-395

FACE OF JEEP RADIATOR

STEEL WIRE CLOTH

COMPRESSED FOAM RUBBER

NOTE:
1/4" - 20 x 1 1/2" LONG CARTRIDGE
BOLT. W/ 1/4" - 20 HEX NUTS.

NOTE:
FINE PARTICLE SCREEN TO BE
FREE STANDING BEHIND JEEP
GRILL GUARD AND IS DESIGNED
TO PULL OUT FOR CLEANING.
WHEN GRILL GUARD IS IN
LOWERED POSITION.

NOTE:
THESE ARE 5/16" 18 TAPPED
HOLES AND ARE IN MOST AC
JEEP FRAMES. IF IN MOST AC
LET A MECHANIC DRILL HOLES
AT ASSEMBLY.

JEEP FRAME

JEEP GRILL GUARD.

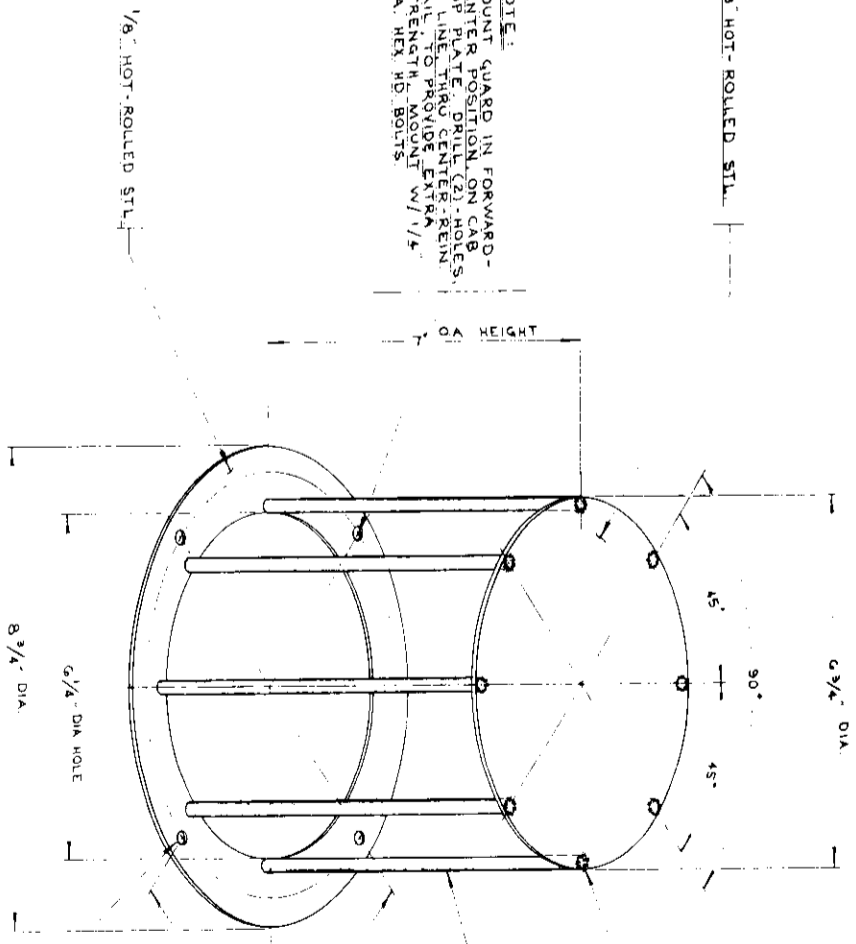
GRILL GUARD MTG. BRKT.

MOUNTING HOLE LOCATIONS
FOR JEEP GRILL MTG. BRKTS.

FINE PARTICLE SCREEN MOUNTING DETAIL
SCALE: FULL

NOTE:
MOUNT GUARD IN FORWARD-
CENTER POSITION ON CAB
TOP PLATE. DRILL (2) HOLES
IN LINE THRU CENTER-REIN-
FORCEMENT TO PROVIDE EXTRA
STRENGTH. MOUNT W/ 1/4"
DIA. HEX HD. BOLTS.

1/8" HOT-ROLLED STL.

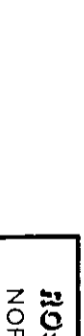
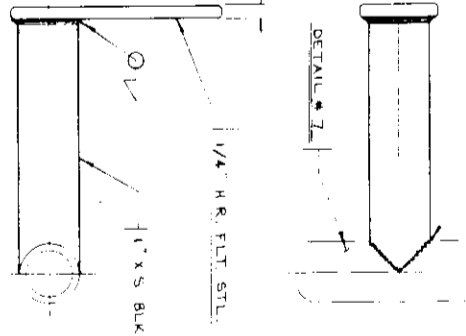
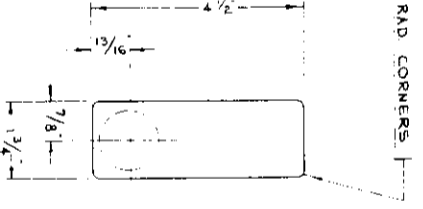


NOTE:
(JEEP) EMERGENCY LIGHT GUARD
PUMPER UNIT PART # 11
(1) - REQ'D.
SCALE: 1/2" = 1"
FOR FULL ASSY. SEE SHEET # 0-395

NOTE:
THIS GUARD IS DESIGNED TO FIT
OVER AN EMERGENCY LIGHT
DESIGN. MAY BE ALTERED TO FIT
DIFFERENT MODELS OF LIGHTS.

NOTE:
LOCATE HOSE HANGERS
FROM CENTER LINE
OF DETAIL #1.

SPECIAL NOTE:
TO PREVENT THE WATER HOSE
FROM TWISTING WHEN UNCOILED,
WRAP THE HOSE IN A FIGURE 8
DESIGN AROUND HOSE HANGERS.

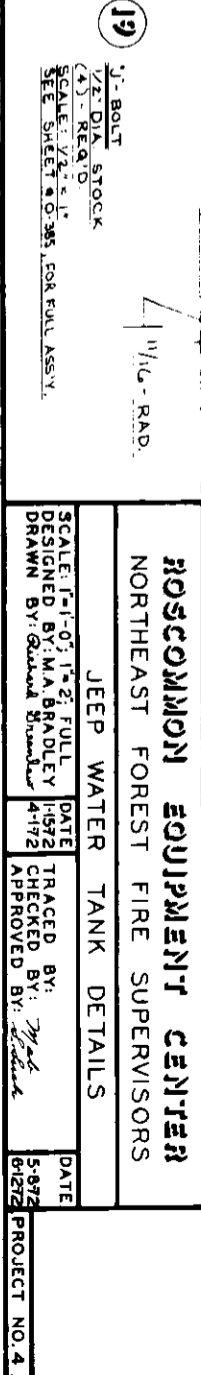
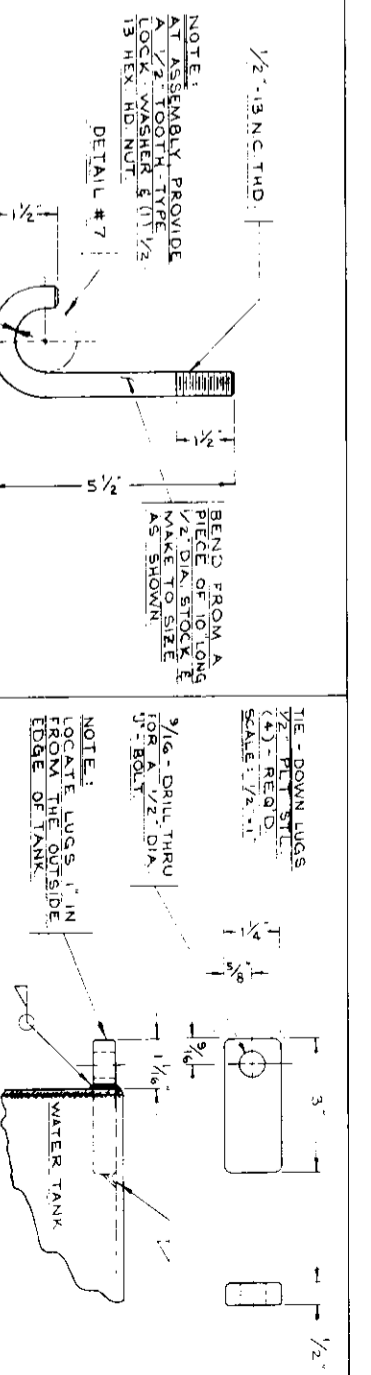
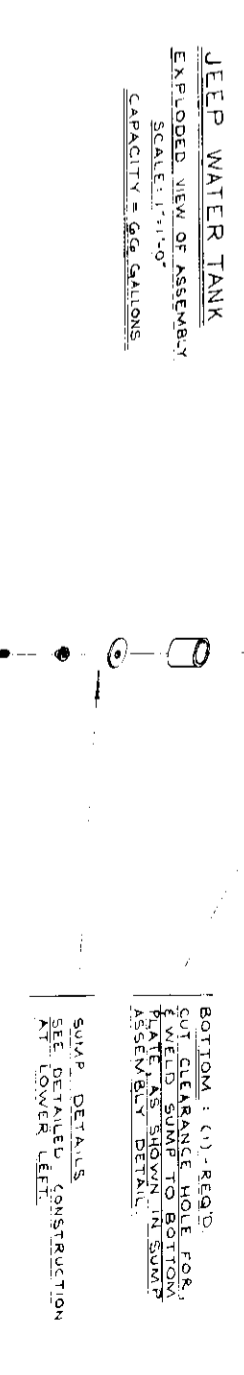
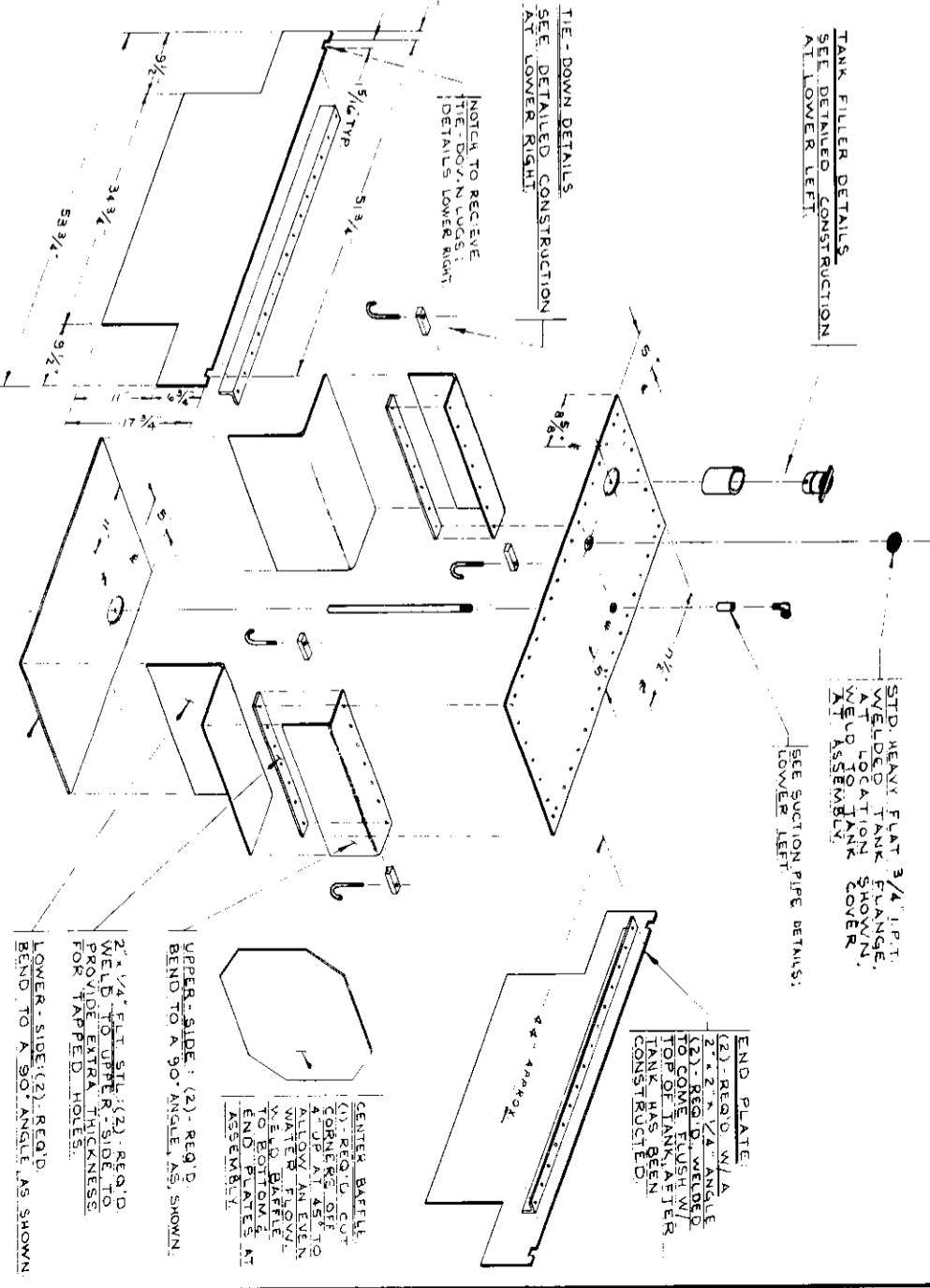
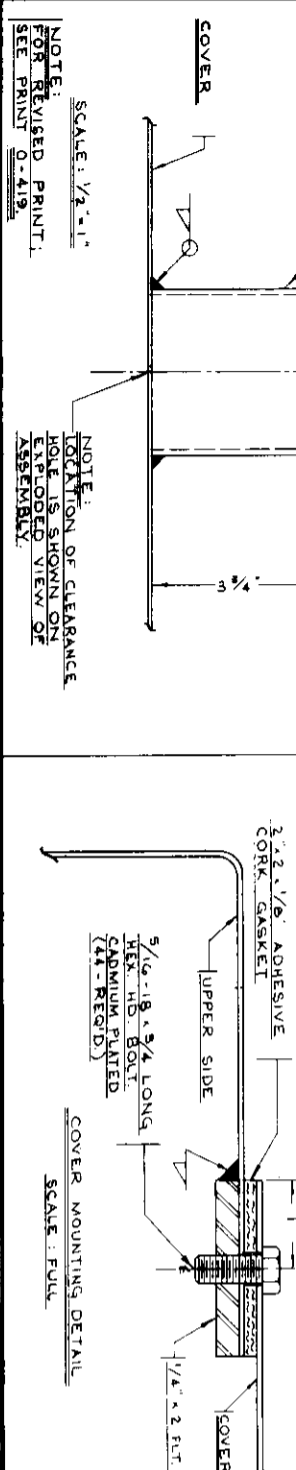
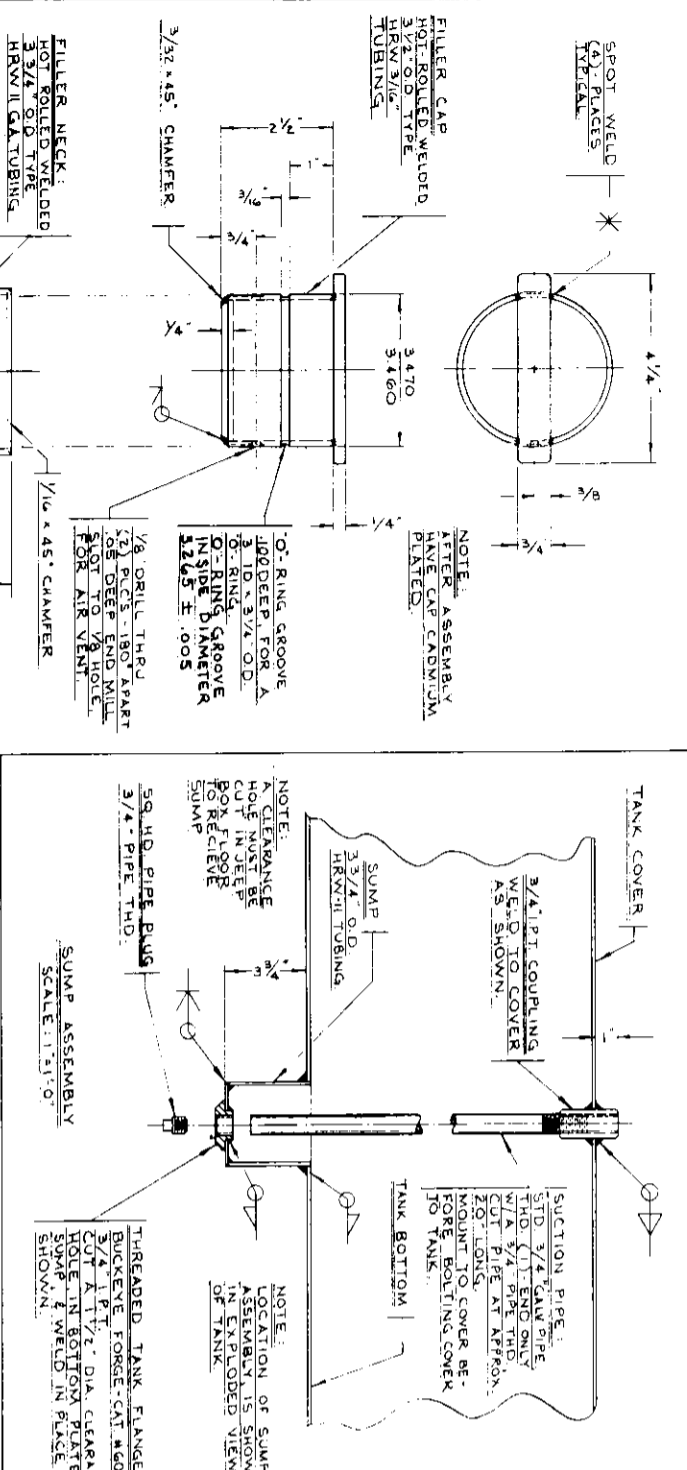
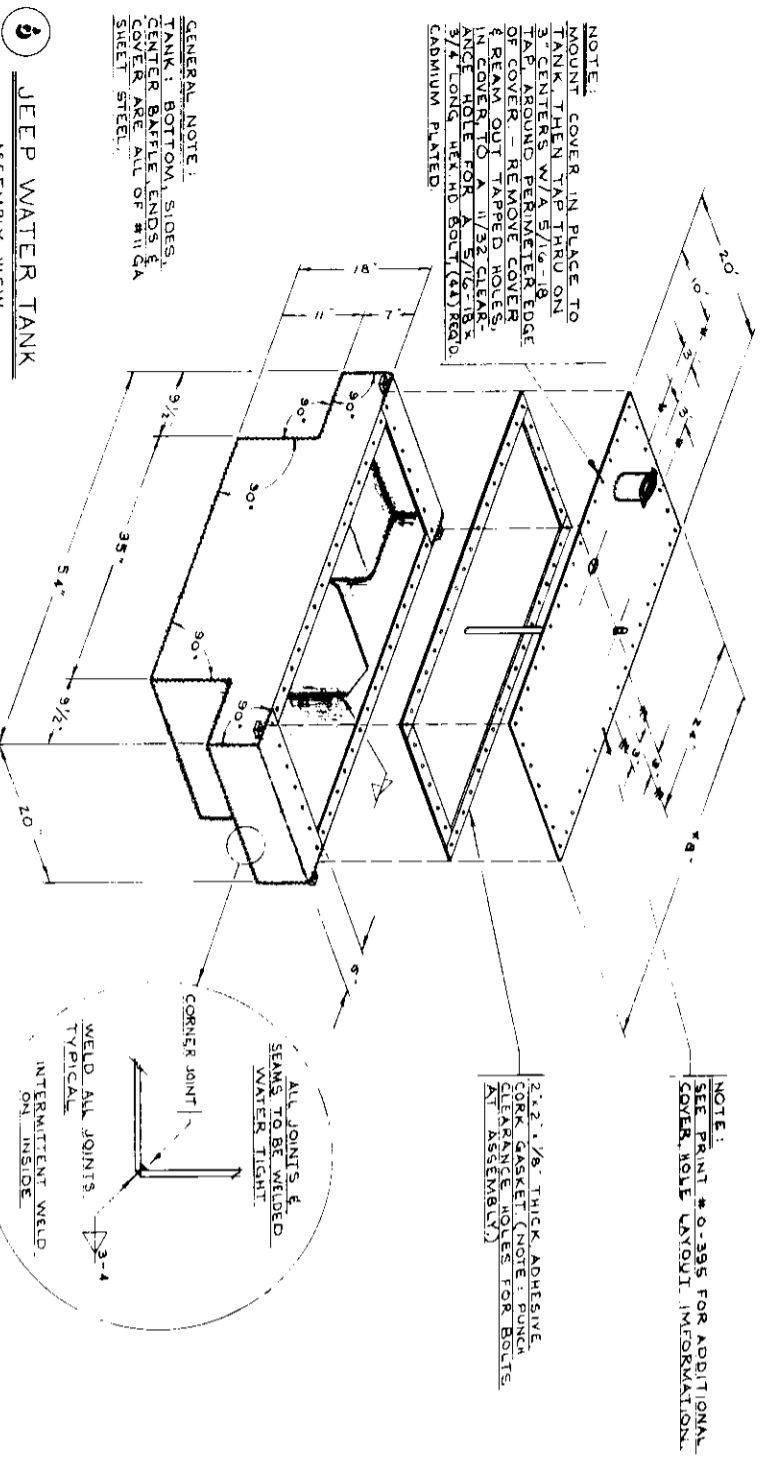


5
HOSE HANGERS
PUMPER UNIT PART # 5
(2) - REQ'D.
SCALE: 1/2" = 1"

ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS
JEEP PUMPER UNIT PARTS: 2, 5 & 11

SCALE: 1" = 4" FULL
DESIGNED BY: M.A. BRADLEY
DRAWN BY: Gerald Brundage
DATE: 1-5-72
TRACED BY: M.A. Bradley
CHECKED BY: M.A. Bradley
APPROVED BY: M.A. Bradley

DATE: 5-8-72
PROJECT NO. 4



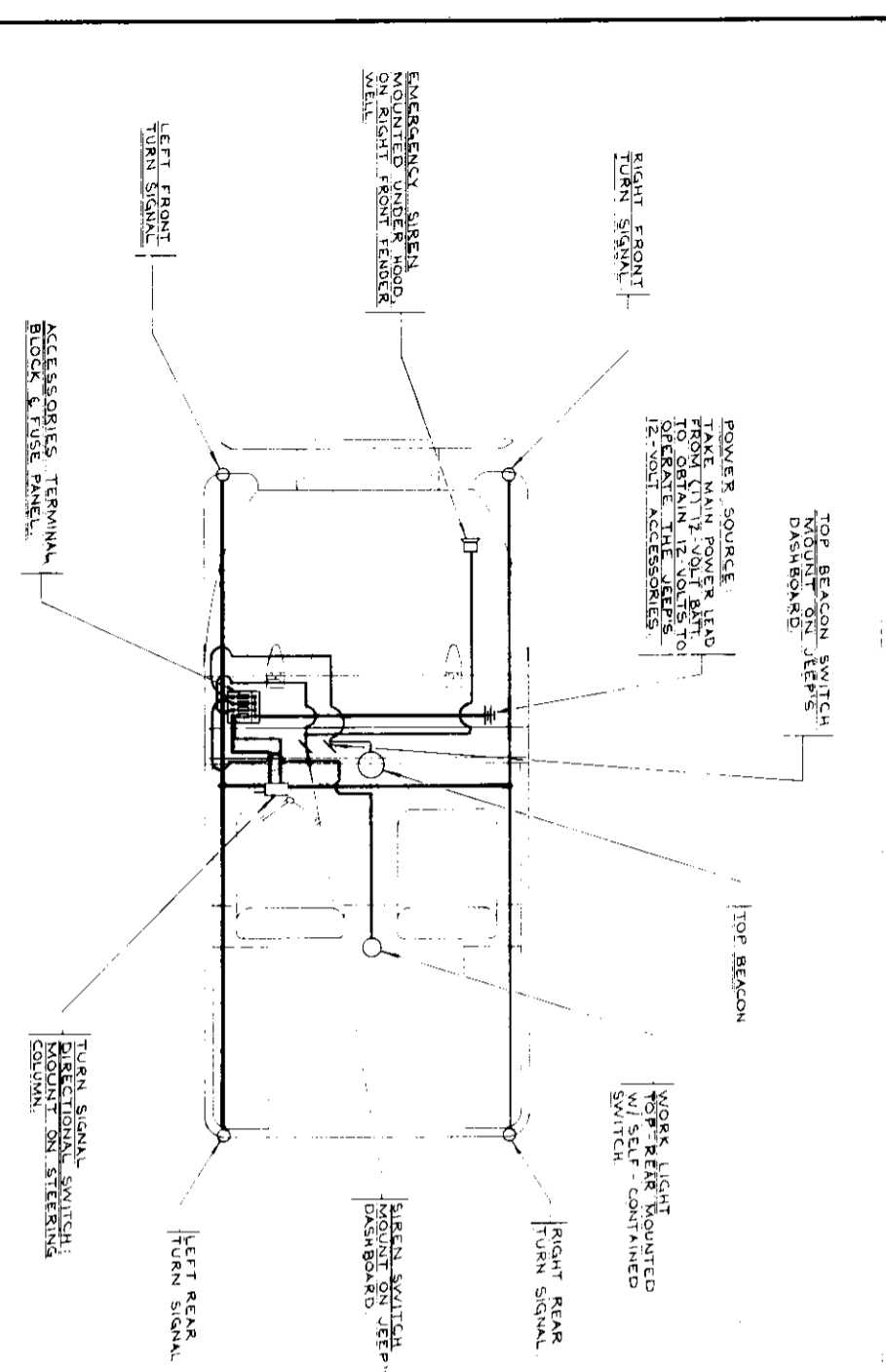
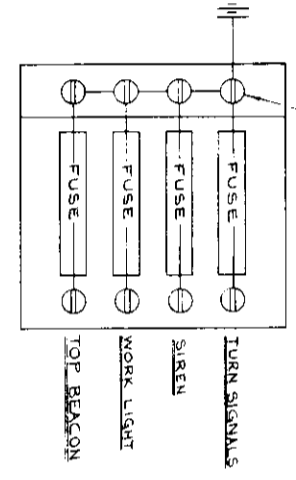
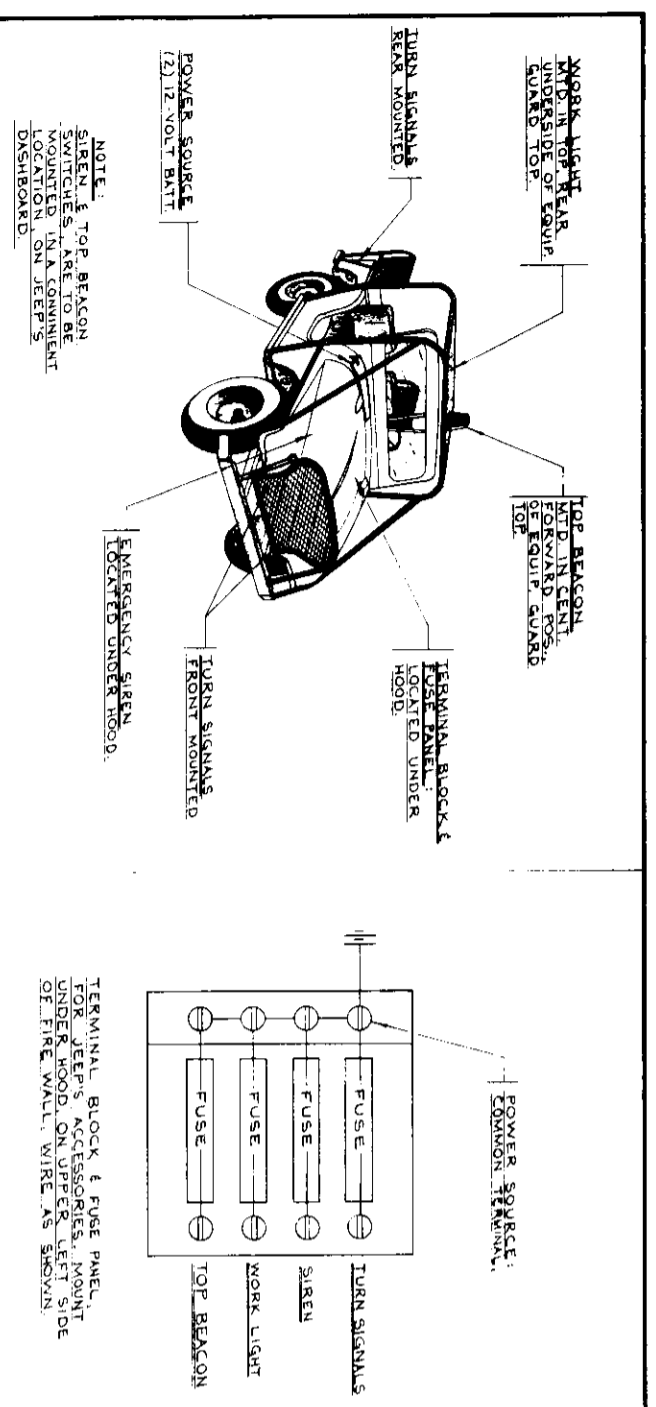
ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS

JEEP WATER TANK DETAILS

SCALE: 1"=1'-0" FULL
DESIGNED BY: M.A. BRADLEY
DRAWN BY: G. BRADLEY

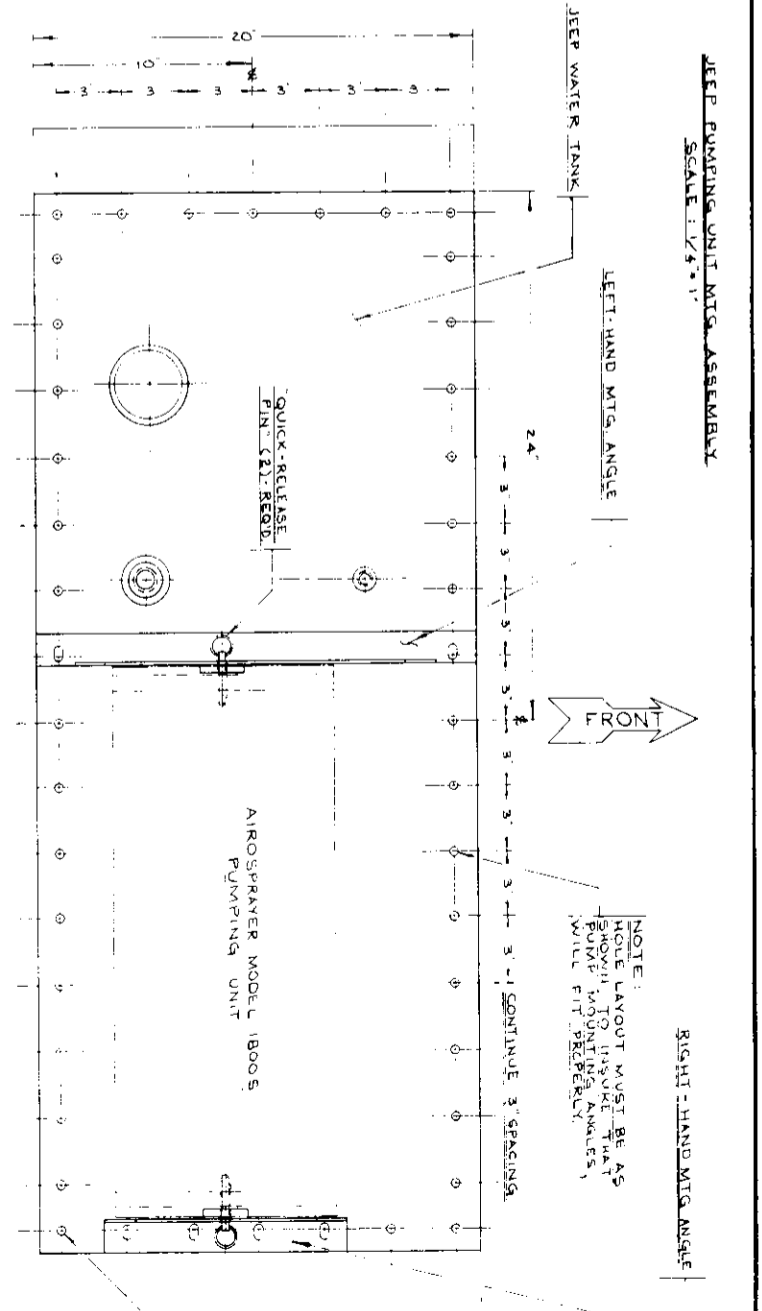
DATE: 11/87
TRACED BY: M.A. BRADLEY
CHECKED BY: G. BRADLEY
APPROVED BY: G. BRADLEY

DATE: 5-87
PROJECT NO. 4



13 JEEP ELECTRICAL ACCESSORIES DIAGRAM
SCALE: NONE
FOR FULL ASSY. SEE SHEET # 0-385

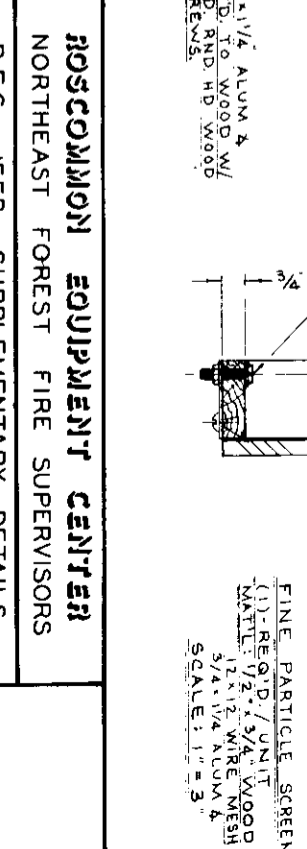
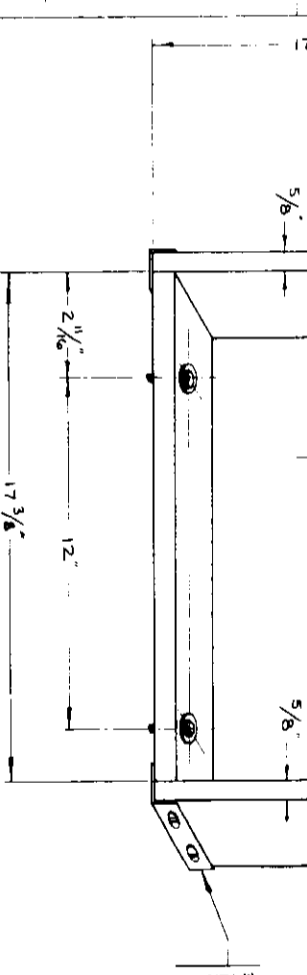
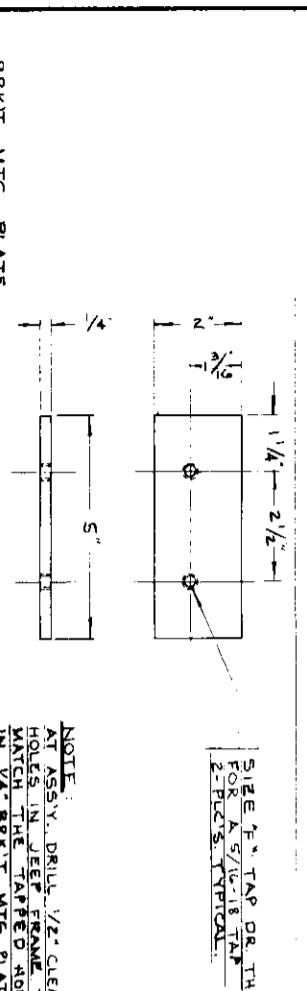
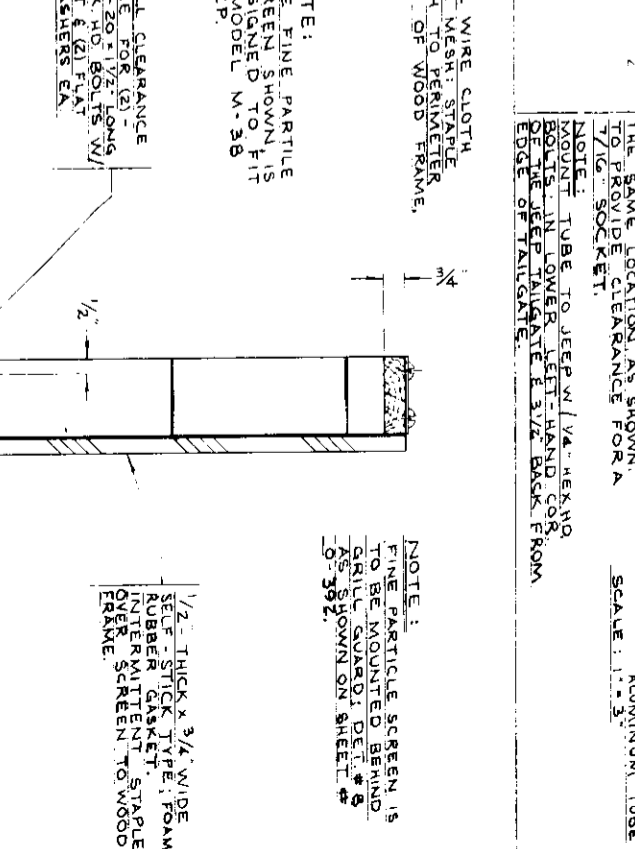
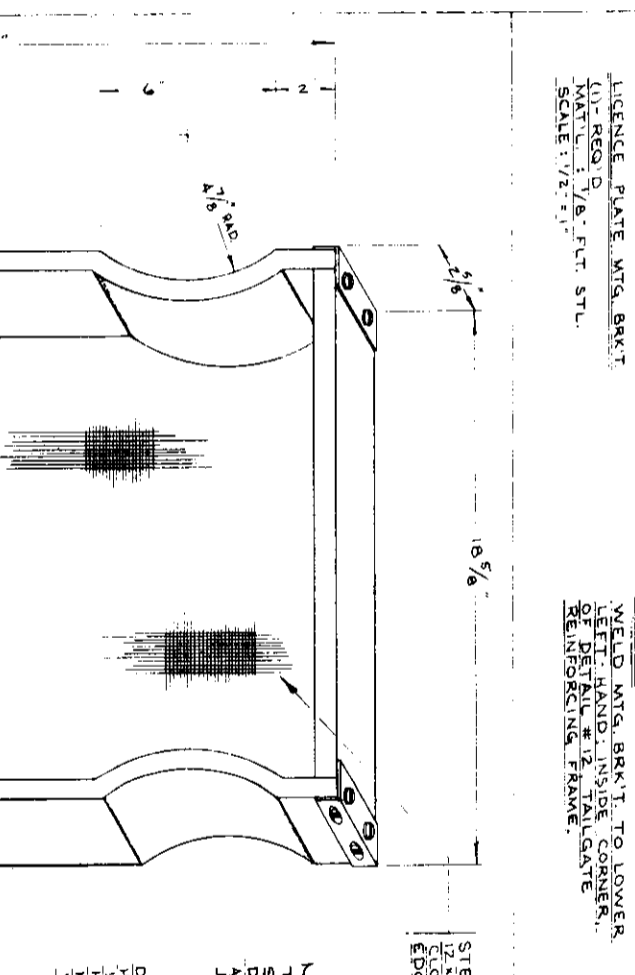
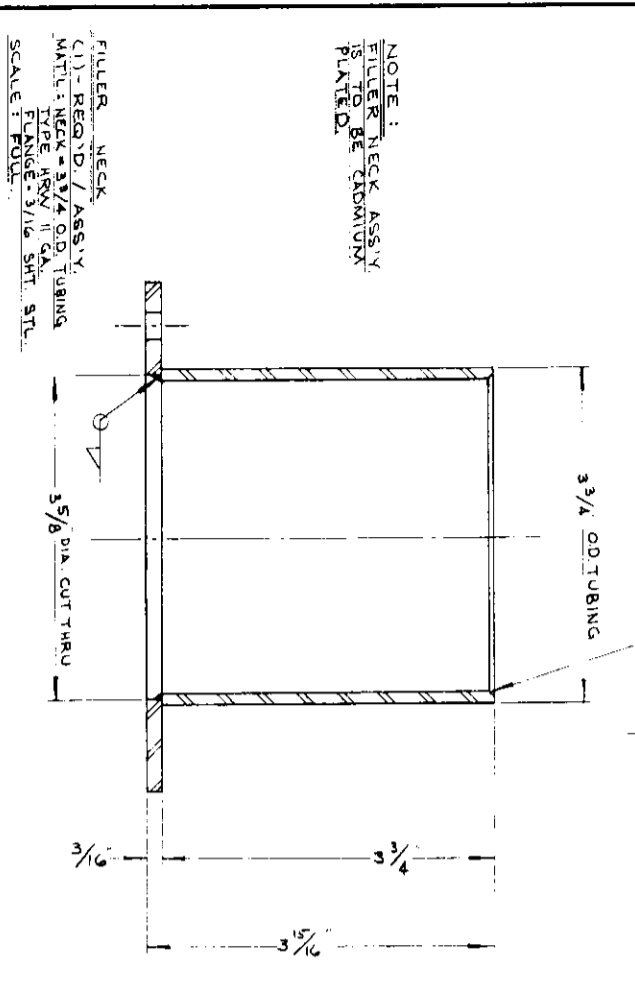
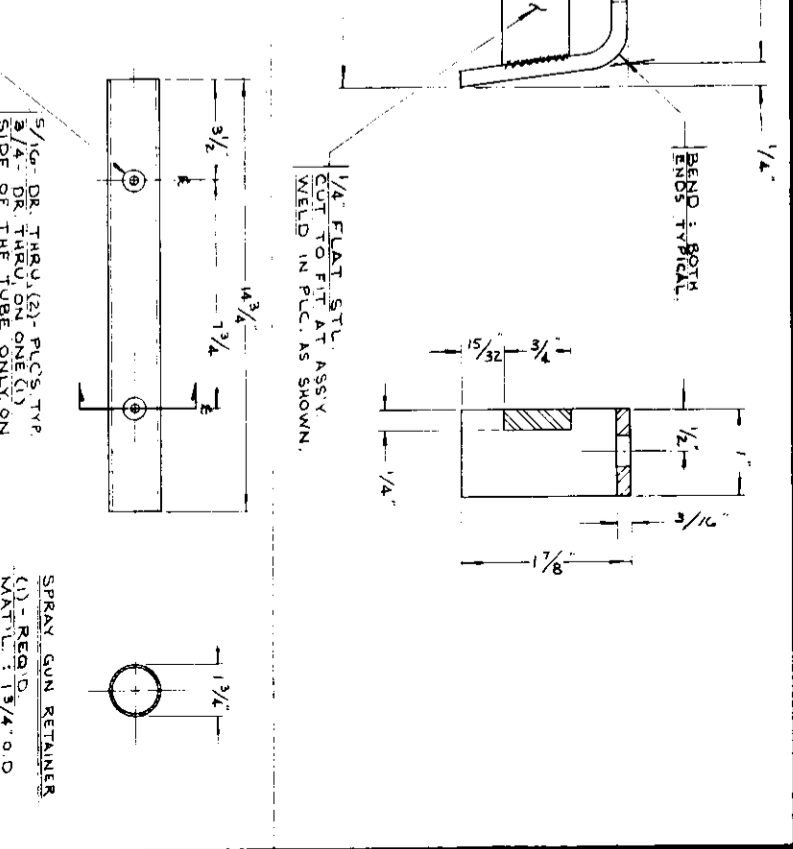
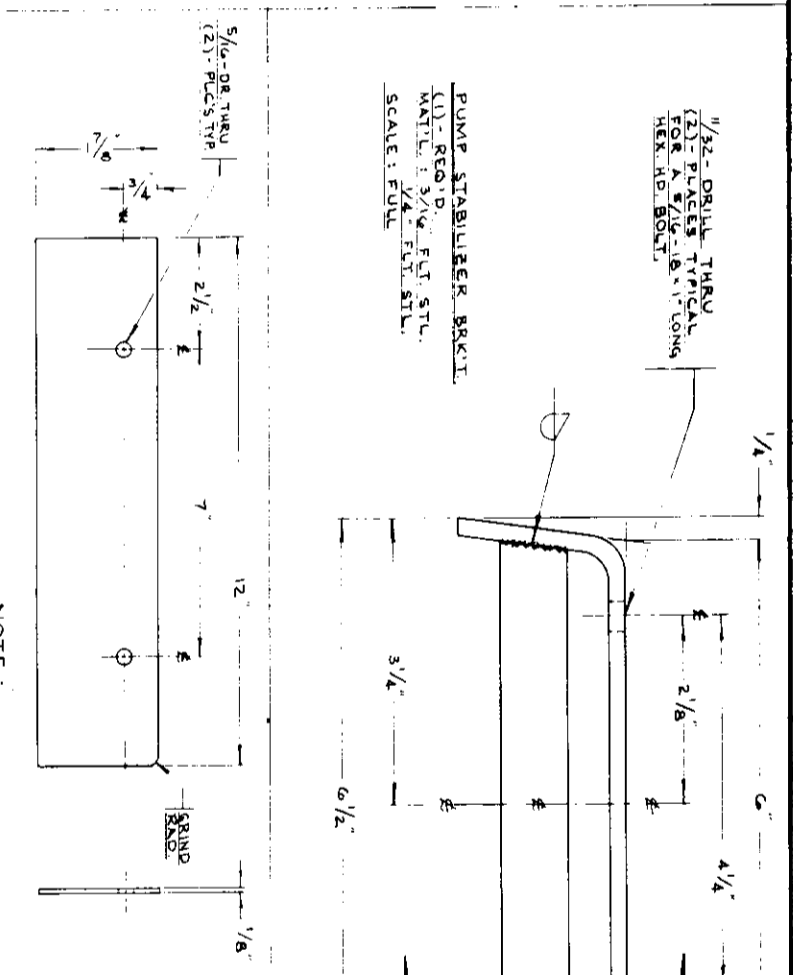
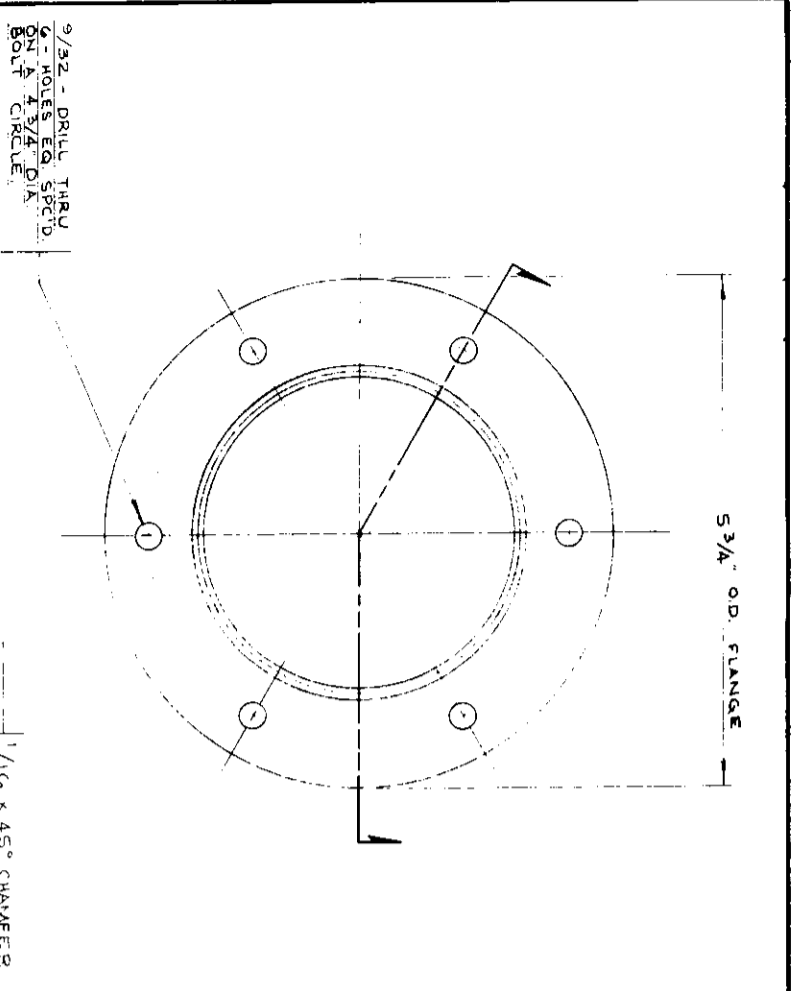
NOTE:
ALL MILITARY JEEPS OPERATE ON A 24-VOLT ELECTRICAL SYSTEM. OBTAINED BY CONNECTING (2) 12-VOLT BATTERIES IN SERIES WITH OTHER



NOTE:
MOUNTING ANGLES SHOWN ARE DESIGNED TO FIT THE AIROSPRAYER MODEL 18005 PUMPING UNIT

ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS
ACCESS WIRING DIAGRAM: PUMP MOUNTING ANGLES

| | | | |
|---------------------------|---------------|---------------------------|---------------|
| SCALE: AS SHOWN | DATE: 3-6-72 | TRACED BY: M.A. BRADLEY | DATE: 5-8-72 |
| DESIGNED BY: M.A. BRADLEY | DATE: 4-20-72 | CHECKED BY: M.A. BRADLEY | DATE: 6-12-72 |
| DRAWN BY: G. BRADLEY | | APPROVED BY: M.A. BRADLEY | |



NOTE:
FILLER NECK ASSY IS TO BE ZINCUM PLATE D.

FILLER NECK
(1) - REQ'D. / ASSY
MATT: 3/4\"/>

BRKT. MTG. PLATE
(2) - REQ'D.
MATT: 1/4\"/>

NOTE:
AT ASSY. DRILL 1/2\"/>

SIZE 7/8\"/>

LICENCE PLATE MTG. BRKT
(1) - REQ'D.
MATT: 1/8\"/>

NOTE:
WELD MTG. BRKT. TO LOWER LEFT HAND INSIDE CORNER. OF DETAIL # 12 TAILGATE REINFORCING FRAME.

STEEL WIRE CLOTH
(2) 12\"/>

NOTE:
THE FINE PARTICLE SCREEN SHOWN IS DESIGNED TO FIT A MODEL M-38 JEEP.

DRILL CLEARANCE HOLE FOR (2) 3/4\"/>

3/4\"/>

NOTE:
FINE PARTICLE SCREEN IS TO BE MOUNTED BEHIND GRILL GUARD DET # 8 AS SHOWN ON SHEET # 0-392.

1/2\"/>

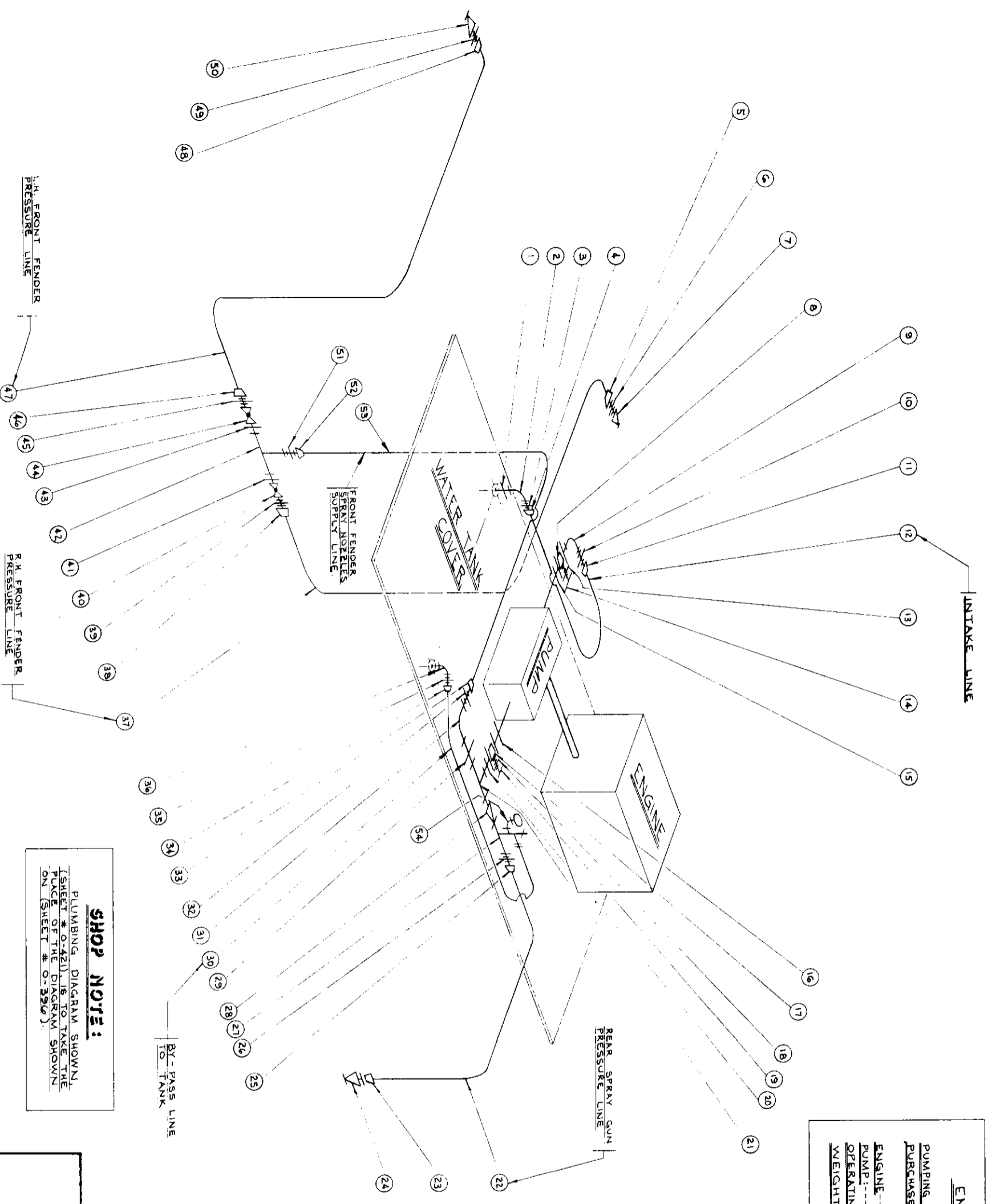
FINE PARTICLE SCREEN
(1) - REQ'D. / UNIT
MATT: 1/2\"/>

ROSCOMMON EQUIPMENT CENTER
NORTHEAST FOREST FIRE SUPERVISORS
REC. JEEP SUPPLEMENTARY DETAILS

| | |
|----------------------------|--------|
| SCALE: 1"=3'-2" FULL | DATE |
| DESIGNED BY: M.A. BRADLEY | 11-572 |
| DRAWN BY: Richard Brundley | 11-572 |
| TRACED BY: | DATE |
| CHECKED BY: | 11-572 |
| APPROVED BY: | 11-572 |
| PROJECT NO. 4 | |

ENGINE & PUMP SPECIFICATIONS

PUMPING SYSTEM, (PACKAGE UNIT) ----- AIRSOPRAYER NO. 1800S
 PURCHASED FROM ----- THE AIRSOPRAYER CO.
 BOX 269
 NEODESHA, KANSAS 66157
 ENGINE ----- BRIGGS & STRATTON 3HP 6:11 GEAR REDUCTION
 PUMP ----- ROLLER TYPE HEAVY DUTY HYPRO PUMP W/ NI RES. BODY
 OPERATING PRESSURE ----- 0-250 P.S.I.
 WEIGHT ----- APPROX.: 75 lbs.



SHOP NOTE:
 PLUMBING DIAGRAM SHOWN
 (SHEET # 0-421) IS TO TAKE THE
 PLACE OF THE DIAGRAM SHOWN
 ON (SHEET # 0-396).

| NO. | PART | DESCRIPTION |
|-----|-------------------------|---|
| 54 | STREET ELL | 1/4" I.P.T. x 90° |
| 53 | HOSE | 1/2" I.D. 200-300 P.S.I. RATING (FRONT DIS. LINE) |
| 52 | HOSE COUPLER | SAME AS # 25 |
| 51 | ADAPTOR | SAME AS # 3 |
| 50 | SPRAY NOZZLE | SAME AS # 7 |
| 49 | ADAPTOR | SAME AS # 3 |
| 48 | HOSE COUPLER | SAME AS # 25 |
| 47 | HOSE | 1/2" I.D. 200-300 P.S.I. RATING (L.H. FRONT FENDER) |
| 46 | HOSE COUPLER | SAME AS # 25 |
| 45 | ADAPTOR | SAME AS # 3 |
| 44 | BALL VALVE | SAME AS # 40 |
| 43 | NIPPLE | SAME AS # 15 |
| 42 | TEE | 3/4" I.P.T. |
| 41 | NIPPLE | SAME AS # 15 |
| 40 | BALL VALVE | 3/4" I.P.T. |
| 39 | ADAPTOR | SAME AS # 3 |
| 38 | HOSE COUPLER | SAME AS # 25 |
| 37 | HOSE | 1/2" I.D. 200-300 P.S.I. RATING (R.H. FRONT FENDER) |
| 36 | STREET ELL | 3/4" I.P.T. x 90° |
| 35 | ADAPTOR | SAME AS # 3 |
| 34 | HOSE COUPLER | SAME AS # 25 |
| 33 | HOSE COUPLER | SAME AS # 25 |
| 32 | ADAPTOR | SAME AS # 3 |
| 31 | ELL | 3/4" I.P.T. x 90° |
| 30 | HOSE | 1/2" I.D. 200-300 P.S.I. RATING (BY-PASS LINE) |
| 29 | NIPPLE | SAME AS # 15 |
| 28 | HEXAGON BUSHING | 3/4" I.P.T. MALE TO 1/2" I.P.T. FEMALE |
| 27 | BY-PASS OR RELIEF VALVE | (BY AIRSOPRAYER CO.) |
| 26 | ADAPTOR | SAME AS # 3 |
| 25 | HOSE COUPLER | 3/4" N.H. FEMALE THD. W/SHANK FOR 1/2" W.K. |
| 24 | SPRAY GUN | (BY AIRSOPRAYER CO.) |
| 23 | HOSE COUPLER | 3/4" N.H. MALE THD. W/SHANK FOR 1/2" HOSE |
| 22 | HOSE | 1/2" I.D. 200-300 P.S.I. RATING (REAR DISCHARGE) |
| 21 | TEE | 3/4" I.P.T. |
| 20 | NIPPLE | SAME AS # 15 |
| 19 | HOSE END CAP | SAME AS # 14 |
| 18 | ADAPTOR | SAME AS # 3 |
| 17 | VALVE | SAME AS # 8 |
| 16 | NIPPLE | SAME AS # 15 |
| 15 | NIPPLE | 3/4" I.P.T. x 2" LONG. |
| 14 | HOSE END CAP | 3/4" N.H. THD. |
| 13 | ADAPTOR | SAME AS # 3 |
| 12 | HOSE | 3/4" I.D. 200-300 P.S.I. RATING (INTAKE LINE) |
| 11 | HOSE COUPLER | SAME AS # 4 |
| 10 | ADAPTOR | SAME AS # 3 |
| 9 | STREET ELL | 3/4" I.P.T. x 90° |
| 8 | VALVE | 3-WAY PLUG W/ 3/4" I.P.T. FEMALE THD. (3 P.C.S.) |
| 7 | SPRAY NOZZLE | DETAIL # 7 FRONT FENDER MOUNTED |
| 6 | ADAPTOR | SAME AS # 3 |
| 5 | HOSE COUPLER | 3/4" N.H. FEMALE THD. W/ 30° SHANK FOR 1/2" I.D. HOSE |
| 4 | HOSE COUPLER | 3/4" N.H. FEMALE THD. W/ SHANK FOR 3/4" HOSE |
| 3 | ADAPTOR | 3/4" I.P.T. TO 3/4" N.H. THD. |
| 2 | ELL | 3/4" I.P.T. x 90° |
| 1 | NIPPLE | 3/4" I.P.T. x 2 1/2" LONG |

ROSCOMMON EQUIPMENT CENTER
 NORTHEAST FOREST FIRE SUPERVISORS

JEEP PLUMBING DIAGRAM
 SCALE: NONE
 DESIGNED BY: M.A. BRADLEY
 DRAWN BY: G. L. BRADLEY
 DATE: 9-1-72
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]
 PROJECT NO. 4