



Vehicle Operations

The overall classification of this briefing is: **UNCLASSIFIED**





Agenda

- Purpose
- Identify criteria for vehicle selection
- Understand vehicle control
- Understand Rural considerations for vehicle operations
- Learn how to prepare a vehicle (Rural)
- Understand roadside contingencies (Rural)



Purpose

- To provide the end-user, with viable methods and processes to conduct vehicle operations in an austere and semi-permissive austere environment.



Vehicle Selection





Area Assessment

- Traffic patterns / Laws
- Vehicle availability
- Maintenance Facilities
- Routes
- Available Maps
- Plates / Stickers



Vehicle Operations (Urban)

- Documentation
 - License
 - Registration
 - Required Decals
- Cellphone / Radio (Call Signs or POCs)
- Know the street laws
- GPS/Map
- Area familiarization
- Right side driving





Vehicle Selection (Urban)

- Speed
- Make Model
- Size
- Fuel
- Economy
- Transmissions
 - Manual / Automatic
- Serviceability
- Buying / Renting
- Electrical power options



Off Road Vehicle Control



Vehicle Control

- Use the vehicle skillfully within its full capability
- Learn to communicate properly with the vehicle
- Develop strong professional driving attitude
- Every vehicle will accept three commands
 - Go
 - Stop
 - Turn



Vehicle Control

Three indicators of vehicle control:

Comfortable Am I comfortable?

Accuracy Can I place the vehicle EXACTLY where I want it to be.

Relaxed Am I relaxed?

The three indicators of vehicle control determine your vehicle speed.



Vehicle Control

Steering



Hands at 10-2 and steering can be applied instantly in either direction



Hands placed in a position of readiness as you approach the bend



*Now in the bend
Maximum leverage and feel. Option of putting in or taking out steering instantly.*



Vehicle Control

Using your eyes - Every decision you make begins with what you see.

- Scanning technique
- Proper sight picture
- Read the terrain



Vehicle Control

Scanning technique

- Quick glances 360° around the vehicle
- Do not stare at anything too long

Proper Sight Picture

- Look where you want the vehicle to go not where the vehicle is going



Vehicle Control

Reading terrain

The key to reading terrain is to repeatedly ask yourself:

- What is different
- What will hurt me
- What will cause me to make adjustments to the vehicle

If there is nothing there look for the next obstacle





Vehicle Control

- Proper Throttle Use
- Proper Brake Pedal Use
- Making A Turn
- Vehicle Placement
- Choosing a route



Vehicle Control

Proper Throttle Use

- Learn to squeeze gently when applying pressure.
- Hold steady throttle to maintain constant speed.
(use engine RPM as gauge).
- Breathe off gently when removing pressure

(This technique limits wheel spin, makes the vehicle predictable & minimizes component wear and tear)





Vehicle Control

Proper Brake Pedal Use

- Use left foot on the brake pedal
- Make all speed adjustments prior to the obstacle
- Use threshold braking to avoid lock-up



Vehicle Control

Threshold braking – To slow a vehicle at the optimum rate using the brakes. The technique involves the driver controlling the brake pedal (or lever) pressure to maximize the braking force developed by the tires. The optimal amount of braking force is developed at the point when the wheel just begins to slip.



Vehicle Control

Making A Turn

- Identify exit before you enter a turn
- The sharper the turn, the slower your vehicle entrance speed.
- Maximum braking occurs in a straight line prior to the entrance of a turn
- Pick specific points throughout the turn you want to place individual tires.
- Once entering a turn begin gentle acceleration



Vehicle Control

Vehicle Placement

- HMMWVs are slightly wider than other vehicles
- Use driver side of vehicle initially to aid in proper placement of your vehicle.
- Be specific where you want each individual tire to be on the roadway
- Use all available clues , then adjust



Vehicle Control

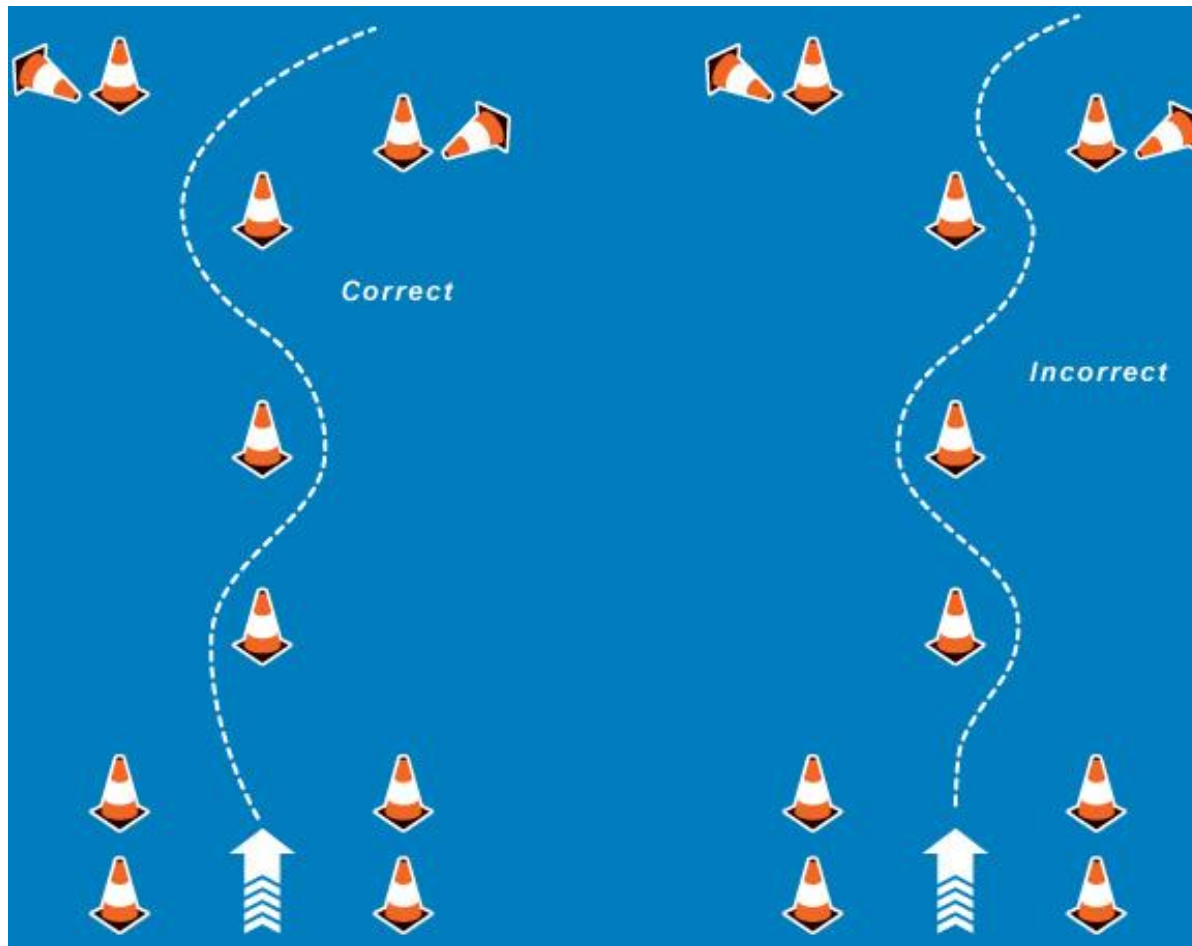
Choosing a route

- Choose your path through an obstacle *BEFORE* you enter the obstacle.
- Choose a path that is easiest for the vehicle to negotiate.
- Search for terrain contours that provide a natural path as if you were walking



Vehicle Control

Choose a path that is easiest for the vehicle to negotiate.





Vehicle Preparation





Vehicle Preparation

Common Mistake

Often , tactical vehicles are treated like bottomless rucksacks. Keep your vehicle fast light and efficient.



Vehicle Preparation

Air down for more traction





Vehicle Packing List

- Snacks
- Bottled Water
- Pen / Paper
- Digital recorder
- Camera
- Map
- Lighter adapter
- Emergency kit
- GPS
- Weapons
- Spare batteries
- Change of clothes
- Coins / Passes
- Headlamp
- Tool kit
- First aid kit





Vehicle Maintenance



Vehicle Maintenance

P – Petroleum

O – Oil

W – Water / Coolant

E – Electricity (Lights)

R – Rubber (Tires)



The teams ability to maintain vehicles





Vehicle Maintenance

- Identify talent on your team
- Identify local vehicle repair sites (Embassy repair facility or vetted repair facility)
- Keep common parts on hand (Tires, hoses, filters, POL, drive belts, spare batteries, etc.)
- **When using off site repair facilities make every effort to remove personal, high dollar and sensitive items.**
- **Always check the glove compartment and under the seats**





Navigation



Navigation

Planning

- Develop efficient route planning techniques for both rural and urban navigation
- Develop driver/co-driver communications
- Limit halts for map checks



Navigation

GPS vs. Map

GPS dependent navigation

- Efficient
- Poor area awareness
- Limited route information/ individual memory

Map dependent navigation

- Good area awareness
- Very inefficient, requires frequent halts for map checks
- Operational area map coverage is often a compromise
- Frequent overshoots, wrong turns, switchbacks

Best practice is to have both on hand and navigate with your eyes



Navigation

Way-points

- Single waypoints at key landmarks do not provide adequate information
- Series waypoints use multiple locations to reduce map checks and navigation errors
- Series waypoints take advantage of GPS efficiency and auto waypoint advance
- Takes longer to set-up, but makes navigation much more efficient in the fields





Vehicle Recovery



Vehicle Recovery

Principles of recovery:

- Don't get stuck
- One stuck vehicle is better than two stuck vehicles
- Use sound technique, improvise only when necessary
- Don't let Chiefs over populate the Indians
- Signals only work when everyone knows what they mean





Vehicle Recovery

- Self recovery
- Kinetic Rope
- Winching



Vehicle Recovery

Self recovery

- Often first resource
- Use only simple tools
- Labor intensive
- Limited application
- Can make things worse
- Least advantageous (Only vehicle power)



Vehicle Recovery

Self recovery tools

- Air down to elongate patch
- Sand channels for soft surfaces
- Pioneer tools
- Hi-Lift jack



Vehicle Recovery

Self recovery tools

Sand Channels or Sand Ladders



Vehicle Recovery

Self recovery tools – High Lift Jack

- Makes a poor tire jack on most tactical vehicles due to lift rating and unstable nature.
- Never use for under vehicle repairs without blocking and choking the vehicle.
- Requires continuous maintenance and inspection before use.
- Can be used for “jack-bumping” on side slope recovery



Vehicle Recovery

Recovery – Kinetic Rope

- Very efficient- uses kinetic energy (rubber band principle)
- Longest possible range of any method
- Least labor intensive
- Variety of techniques increases chances of success



Vehicle Recovery

Recovery – Winching

- Time consuming
- Controlled power
- Most often used for obstacle negotiation
- Requires commitment of two vehicles
- Variety of techniques increase versatility and chances of success
- Effective controlled recovery
- Requires training



Vehicle Recovery

Winching Safety

- Inspect winch cable, hook, and clevises for cracks, frays rust and damage.
- Never use winch as a tow device
- Use gloves when using wire line cable
- Stand clear of vehicle and line of cable
- Hooks always open up





Vehicle Recovery

- Hi-lift Jack
- Tow straps - 2 or more, 2 inch width or wider, 20 foot or longer
- Tree saver
- Come-along (one or more)
- D-rings, Shackles
- Shovel
- Chainsaw and bar oil, 2 cycle engine oil, spare chain (can be handy in recover situations, as well as for trail clearing on wooded trails)
- Winch Kit: tree strap, hi-lift jack, snatch block, pickle fork, shackle, gloves
- Pullpal





Packing Lists



Basic List

- First Aid Kit (See Safety and Survival below)
- Basic Personal Essentials (water, food)
- Spare Tire, Full Size
- Jack and tire iron to change your tire
- Tow strap
- Tree saver
- Come-alongs
- Basic Tool Kit
- Spare Key for vehicle



Safety and Survival

- Adhesive Tape
- Antiseptic Ointment
- Alcohol swabs
- Band-Aids (assorted sizes)
- Blanket
- Cold Pack
- Disposable Gloves
- Gauze Pads
- Hand Sanitizer
- Plastic Bags
- Scissors and Tweezers
- Small Flashlight and Extra Batteries
- Triangular Bandage
- Burn-aid gel
- Snake Bite kit
- Disposable emergency blanket
- Instant Cold pack
- Instant Hot pack



Medical

Medications:

- Anti-diarrhea
- Tylenol
- Ibuprofen inflammation reduction
- Benadryl (allergic reactions)
- Epinephrine or Epi Pen (serious/fatal allergic reactions)



Communications

- PACE plan for comms (Redundancy)
 - **Primary** - 2 way vehicle to vehicle (MBTR)
 - **Alternate** – Cell phone
 - **Contingency** – SATCOM
 - **Emergency** – Iridium
- Power inverter if necessary
- Spare batteries
- Solar panels for charging small devices



Safety/Survival

Safety

- Safety Glasses
- Leather Gloves
- Fire Extinguisher - Should be mounted in the vehicle in an easily accessible location.
- Flares
- Tarp
- flashlights
- matches / lighter





Vehicle Equipment List

- GPS
- 2-way radio
- Water
- Maps
- “Bugout” bag
- Ammo
- Weapons
- EPA
- Survival gear
- Emergency Comms
- Vehicle recovery gear
- Fuel cans
- Spare tire, belts, POL
- Spare batteries
- Medical Kit
- Mission essential gear
- Toolbox





Personal Essentials

- **Water** – 1 Gallon/person/day. Drier, hotter climates may require more.
- **Food** - Bring food for twice the amount of time you are planning on being gone. trail mix, beef jerky, fruits, dry/canned food, etc.
- **Extra Cloths** - Nobody likes to sit in wet cloths for an extended period of time.
- Sun block
- Rain Jacket
- Trash bags - Keep your trails clean
- Maps, information about the area
- Compass and/or GPS
- Water purification tablets



Conclusion

- Travel off road in 2 or more vehicles
- When packing; If you know you need it, take it If you think you need it, think again !
- Murphy's Law of contingency operations - If it looks stupid and it works , it isn't stupid
- Every vehicle will accept three commands (Go, Stop, Turn)
- Accidents result when drivers exceed the limits of the vehicle or exceeds the limits of his skill level

