BULLETIN

NO.: 20-053

DATE: April 9, 2020

TO: All Personnel

FROM: Chris Webber, Assistant Fire Chief, Emergency Operations

SUBJECT: Incident Review – Winch Cable Break

Please find attached the Informational Summary Report (Incident Review) for the Brush Apparatus Winch Incident.

Reviewed by the Occupation Health and Safety Committee's investigation sub-committee; lead investigators:

- David Picone, Battalion Chief, Health and Safety Officer
- James Laing, Fire Captain, Driver Training Officer
- Kyle O'Neill, Engineer, Cancer and Health Coordinator

Any questions should be directed through the chain of command.

Please contact the Health and Safety Office at SDFDHealth&Safety@sandiego.gov with comments or areas of improvement. For all other questions contact HSO/Battalion Chief David Picone at 619.533.4466 or dpicone@sandiego.gov

Wellness Resources link: "Promoting Safe and Healthy Lives" or call **833-SDFD-HSO**
password - support

Informational Summary Report

Incident Review

San Diego Fire-Rescue Department

Brush Apparatus Winch Incident

Monday, December 02, 2019

SUMMARY

On Monday December 2nd, 2019 while conducting driver training a fire department engine became stuck in mud. Crews utilized the brush apparatus winch to attempt to pull the engine out causing failure to the winch cable. The engine and brush company attached a chain to pull the stuck apparatus out of the mud.

CONDITIONS

Weather conditions were clear and dry with recent rain documented within the prior 24 hours.

SEQUENCE OF EVENTS

While conducting driver training for an upcoming engineer manipulative test, an engine became stuck in the mud. This occurred while circling around a vacant parking lot and attempting to drive through a 20' x 40' rectangular section of dirt (non-asphalt surface) that was surrounded by asphalt.

After the crew became stuck they attempted to get out by emptying the water tank then used available sand bags, gravel and wood boards to gain traction to the rear wheels, with all attempts proving unsuccessful. The engine Captain then notified Emergency Command & Data Center (ECDC) that they were out of service and requested Battalion Chief (BC) notification and a tow/heavy wrecker to assist removing them from the mud. The ECDC BC called the responding BC and based on prior past practice, the suggestion was made to use a brush apparatus instead of using a heavy wrecker. A brush apparatus was dispatched to assist extrication efforts with the engine.

Upon arrival of the brush apparatus, those at scene discussed the use of the winch to pull the engine out of the mud. The brush Engineer expressed concern that the winch was "not made to pull out rigs". After additional discussion, the decision was made to connect the winch cable to the rear of the engine and attempt to pull the apparatus out backwards.

Chains with grab hooks were used from the brush apparatus and secured through the rear hook of the engine. The hook of the winch was attached to the chain and a safety perimeter was established by the brush Captain prior to tensioning the winch. Almost

immediately after the winch was engaged and tensioned the winch cable failed and splintered or "bird caged" close to the hook that was attached to the chain.

The brush apparatus Engineer then attached the chains directly to the engine using the open hook of the brush apparatus. The brush apparatus' transfer case was placed into 4wd/low with the transmission in reverse. The firefighter that was performing driver training was still operating the engine and placed it in reverse. With this assistance the engine was extricated from the mud.

INJURIES/DAMAGES

- No reported injuries
- The winch cable was destroyed requiring complete replacement
- No other reported damages

AREAS FOR REVIEW

POST INCIDENT REVIEW

<u>Learning Points</u>

- Crew members are reminded to be aware of their surrounding environment when training
- Driver and driver trainees need to be diligent after rain fall in areas of unpaved roadways
- Avoid driving through these areas whenever possible by planning ahead of moving the apparatus
- A good rule to follow is to face out in preparation of an emergency response call to remain operationally ready
- Use good judgement when considering driving on unpaved roadways
- When in doubt, back the fire apparatus to avoid potentially getting stuck
- If an incident occurs while someone is training, it is recommended that the rated and fully trained person take back control of the apparatus
- **Engineers shall report any maintenance issues through PSTRAX system**

- **If you are stuck, remember that you are dealing with extremely heavy vehicle loads, only heavy tow trucks and bull dozers have the appropriate rated chains and winch to extricate our apparatus**
    - **In addition, a fire apparatus isn't designed for towing operations**

- Crew members stated that the apparatus immediately sunk into the wet ground
    - To limit potential damage these procedures shall be followed
        - **Engineer**
            - Take control of the fire apparatus from the trainee
            - Remember set parking brake

- If your drive shaft is not buried, empty the tank by flowing the water far away from the apparatus
- Have all crew members get out of the apparatus
- Give only one attempt to drive the apparatus out of the fixed/stuck position

▪ **Captain**

- Immediately notify your assigned BC and place yourself Out of Service (OOS)
- Request a heavy wrecker tow through ECDC
  - Dozer units with rated chains are also acceptable in place of a heavy wrecker

Training deficiencies

- BC's, Captains, and Firefighters did not receive winch training at In Service Training (IST) 19-03
- Newly promoted Engineers have not received winch training

Equipment and proper operating procedures

Winch

- Brush apparatus winches are not rated to remove fire apparatus or anything over its rated capacity of 15,000 lbs.
- The winch is a tool that can be used in a variety of applications
- The intent of this review is to provide examples of use but not limit other potential user options
- SDFD winches can be used to remove downed trees or boulders in roadways, remove or stabilize an auxiliary vehicle (utility, BC, etc.)
- Follow the manufacturer recommendations for use and the winch guidelines in the FD-846 Brush Apparatus Task Book, Chapter 6
  - **Our winches are not to be used as self-recovery tools**
- Be diligent in your pre-trip and preventive maintenance by checking the following conditions of the winch
  - Check your winch cables by completely unspooling the cable, then check for any excessive wear and damage after each use and at least every 90 days
  - Respool under a load working from one side of the drum to the other
- Correct use of the winch
  - When pulling make sure to leave at least 5 wraps on the drum and remember the winch has its greatest pulling force the more wraps left on the drum (so the less cable you spool off the drum the more pulling force you have)
  - The winch cable should be neatly wound around the spooling drum
  - Lay something over the winch cable midway between the winch and the anchor point (line dampener) to absorb energy should the winch cable fail

- Don't be afraid to designate a safety officer (discuss any safety concerns with all crew members before performing any operation with injury potential)

Chains

- Chains are rated to meet specific load rating requirements
- Typical tow truck chains are 3/8" diameter with a grade 70 rating of 6,600 lbs.
- These chains are carried on all SDFD truck companies
  - We also carry grade 80 chains on USAR 2 and 41 which are 3/8" diameter rated to 7,100 lbs. and meet overhead lifting capacities for vehicle rescue operations
- Stay within the safe load limits of manufacture specifications
  - Safe working load limit (WLL) will always be a lower number
  - Many manufacturers typically use a 4:1 safety ratio of failure load vs. WLL
  - Rescue responders should have their chain WLL memorized
    - G7 rescue chain (3/8-inch-diameter), also known as grade 70 chain, has a safe WLL of 6,600 lbs.
    - G8 rescue chain (3/8-inch-diameter), also known as grade 80 chain, has a WLL of 7,100 lbs.
      - This reflects an approximate 7 percent strength increase over grade 70 chain

For more information

- https://www.firehouse.com/rescue/vehicle-extrication/article/21116955/university-of-extrication-rescue-chain-safety-protocols?utm_source=FH+Newsday&utm_medium=email&utm_campaign=CPS200130018&o_eid=7777H6274056I6B&rdx.ident%5Bpull%5D=omeda%7C7777H6274056I6B&oly_enc_id=7777H6274056I6B

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PHOTOS/SITE DIAGRAMS/MAPS