The Safe Use of Fork Lift Trucks

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WHY ARE WE CONCERNED?

HSE ANNUAL STATISTICS

– 70 PEOPLE ARE KILLED

– 2000 ARE SERIOUSLY INJURED

– ? INCIDENTS NOT REPORTED
COULD THIS BE YOU?

A FABRICATOR WAS RECENTLY PROSECUTED AFTER A WORKER WAS FATALLY CRUSHED UNDER A LIFTING TRUCK WHICH TIPPED OVER WHILST EXTRACTING COMPONENTS FROM A RACKED STORAGE SYSTEM.
LEGISLATION

HEALTH & SAFETY AT WORK ACT 1974 (HSW)

MANAGEMENT OF HEALTH & SAFETY AT WORK REGULATIONS 1999

PROVISION AND USE OF WORK EQUIPMENT REGULATIONS 1998 (PUWER)

LIFTING OPERATIONS AND LIFTING EQUIPMENT REGULATIONS 1998 (LOLER)

WORKPLACE (HEALTH, SAFETY AND WELFARE) REGULATIONS 1992

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2007 (CDM)

CONSULTING EMPLOYEES
WHAT HAPPENED?

THE COMPANY WAS FINED £140,000
AND ORDERED TO PAY £32,250
IN COSTS AFTER PLEADING GUILTY TO

- 2(1) INADEQUATE RISK ASSESSMENT
- 3(1) INADEQUATE SYSTEM OF WORK

HSE Campaign Work Place Transport

WORKPLACE TRANSPORT IS THE SECOND LARGEST PROPORTION OF WORKPLACE ACCIDENTS AFTER FALLING FROM HEIGHT

- FAILURE TO CONTROL RISKS - 70% OF WORKPLACE TRANSPORT ACCIDENTS

- STRUCK BY VEHICLE - 76% OF WORKPLACE TRANSPORT DEATHS
  - 42% MAJOR INJURIES

- FALLING FROM VEHICLES - 7% DEATHS
  - 42% MAJOR INJURIES

SAFE SITE – TRAFFIC ROUTES, HOUSEKEEPING, PEDESTRIAN SAFETY

SAFE VEHICLE – STEERING, BRAKES, LIGHTS

SAFE DRIVER – FLT DRIVERS ACoP TRAINED, DRIVERS COMPETENT, ACTIVE SUPERVISION
TODAY I WANT TO FOCUS ON UTILISING FORKLIFT TRUCKS WITHIN THE WORKPLACE WHICH IS THE LION SHARE OF WORKPLACE TRAFFIC ACCIDENTS
THE SAFE USE OF FORKLIFT TRUCKS

AGENDA

• THE BASICS
  - CENTRE OF GRAVITY
  - DISTRIBUTION OF LOAD

STABILITY TRIANGLE

• LATERAL AND LONGITUDE STABILITY

• OTHER FACTORS
  - HOUSE KEEPING / OBSTRUCTIONS
  - PEDESTRIANS
MOST FORK LIFT TRUCKS ARE REAR WHEEL DRIVE WITH THE WEIGHT IN THE BASE OF THE VEHICLE TO REDUCE INSTABILITY

THE “CENTRE OF GRAVITY” FOR A FORK LIFT TRUCK IS PICTURED
WITH A LOAD ON THE FORKS THIS CHANGES THE WEIGHT DISTRIBUTION

AS THE LOAD ALSO HAS ITS OWN CENTRE OF GRAVITY
THE CENTRES OF GRAVITY COMBINE TO CREATE THE COMPOSITE CENTRE OF GRAVITY
THE HIGHER THE BALANCED LOAD

THE HIGHER THE COMPOSITE CENTRE OF GRAVITY
THIS IS A PLAN VIEW OF A FORK LIFT TRUCK

THE TRIANGLE IN RED SHOWS THE STABILITY TRIANGLE
THE REAR WHEELS OF AN FORKLIFT TRUCK ARE ARTICULATED

THIS MEANS THAT THE REAR AXLE IS CONNECTED TO THE CHASSIS IN THE CENTRE
SO THE TRIANGLE IS MEASURED FROM

THE CENTRE OF THE REAR AXLE TO
THE CENTRE OF THE FRONT WHEEL TYRES
IF THE CENTRE OF GRAVITY IS **OUTSIDE THE STABILITY TRIANGLE**

THE FORKLIFT TRUCK IS **UNSTABLE.**
A FORKLIFT DOES NOT HAVE ANY SUSPENSION.

WHEN THE CENTRE OF GRAVITY BECOMES HIGHER THIS CAN CAUSE LATERAL INSTABILITY.

Approximately 75% of all truck turnovers are lateral.
ENSURE THE LOAD IS **CENTRALLY POSITIONED**

DISTRIBUTE THE WEIGHT EVENLY USING FORK SPACING
TURNING SHARPLY AT SPEED WILL MAKE THE FORKLIFT TRUCK HIGHLY UNSTABLE, ESPECIALLY WHEN NOT CARRYING A LOAD
THE FORKLIFT TRUCK CENTRE OF GRAVITY IS FURTHER BACK IN THE THINNER PART OF THE STABILITY TRIANGLE THAN THE COMPOSITE CENTRE OF GRAVITY
The forklift truck centre of gravity is more likely to move out of the stability triangle when turning. The forklift truck should never be turned whilst the load is elevated.
WHAT CAN CREATE LATERAL INSTABILITY?
LATERAL INSTABILITY

• TURNING AT SPEED
• TURNING WITH MAST ELEVATED
• TURNING ACROSS A SLOPE
• FLOOR OBSTRUCTIONS
• POTHOLES
• “LIVE” LOADS
• OFFSET FORKS
• OFFSET SIDE SHIFT
• OFFSET LOAD
• EDGE OF LOADING BAY
THE TIPPING /PIVOT POINT/ FULCRUM IS THE FRONT WHEEL OF THE FORKLIFT TRUCK
IF THE CENTRE OF GRAVITY CROSSES THE PIVOT

THIS WILL CAUSE LONGITUDINAL INSTABILITY
Forklift truck's have a specified rated capacity based on the weight of the forklift truck being heavier than the load.
GRAVITY HAS MORE INFLUENCE OVER A HEAVY LOAD

PULLING THE COMPOSITE CENTRE OF GRAVITY TOWARDS THE LOAD
IF THE LOAD BEING CARRIED IS TOO HEAVY FOR THE RATED CAPACITY OF THE TRUCK

IT WILL TIP FORWARD ON THE FRONT WHEEL
THE DISTANCE FROM THE "FACE" OF THE FORKS TO THE LOAD CENTRE OF GRAVITY IS THE LOAD CENTRE
The composite centre of gravity is pulled by the length of the load centre.
THE SHAPE
OF THE
LOAD
ALSO AFFECTS THE
LOAD CENTRE
FORWARD TILT AT HEIGHT CAN CAUSE INSTABILITY

FORWARD TILT IS MEANT TO ASSIST THE OPERATOR IN WITHDRAWING THE FORKS FROM A LOAD AFTER THE LOAD HAS BEEN STACKED.
Forklift trucks can also turnover due to excessive emergency braking.

Progressive braking will keep stability.
THE FORKLIFT TRUCK SHOULD BE DRIVEN FORWARDS UP THE SLOPE AND IN REVERSE WHEN GOING DOWN THE SLOPE.

TRAVELLING WITH THE LOAD POINTING DOWN THE SLOPE CAN CAUSE THE TRUCK TO OVERTURN OR THE LOSS OF A LOAD.
IF VISION IS BLOCKED ON A SLOPE BY A LARGE LOAD

USE A BANKS MAN
WHAT CAN CREATE LONGITUDINAL INSTABILITY?
LONGITUDINAL INSTABILITY

• OVERLOADING THE FORK LIFT TRUCK
• INCREASING THE LOAD CENTRE
• CARRYING A LOAD THAT IS TOO LONG
• USING FORWARD TILT AT HEIGHT WHEN LADED
• INCORRECT USE OF THE TRUCK ON SLOPES
• HARSH BRAKING
• TRAVELING WITH THE MAST EXTENDED
WHAT FACTORS AFFECT THE STABILITY OF A LOADED FORKLIFT TRUCK?
STABILITY OF A LOADED FORKLIFT TRUCK

- **COMPETENCE** OF THE OPERATOR

*PHYSICAL FACTORS*

- **WEIGHT, SIZE, SHAPE** OF LOAD
- **POSITION** OF LOAD ON FORKS
- **HEIGHT** TO WHICH THE LOAD IS ELEVATED
- **AMOUNT OF** FORWARD MAST TILT
- **FORCES CREATED WHEN** BRAKING
- **HOUSEKEEPING**
GOOD HOUSE KEEPING

FLOOR OBSTRUCTIONS CAN CAUSE A FORKLIFT TRUCK TO OVERTURN

- DEBRIS
- WRAPPING
- CHOCS
- SLIPPERY PATCHES
- DRAINS/ POTHOLES
- KERBSTONES

EMPLOYERS AND OPERATORS SHOULD ENSURE THAT THE TRAFFIC ROUTES ARE IN REASONABLE CONDITION AND FREE FROM OBSTRUCTIONS
COULD THIS BE YOU?

A FORKLIFT DRIVER WAS MOVING A LARGE METAL COIL WITH THE FORKS IN THE RAISED POSITION, RESTRICTING THE DRIVER'S VISION

THE DRIVER WAS UNAWARE TWO OTHER EMPLOYEES WERE IN THE WAREHOUSE AND HIT ONE OF THE WORKERS KNOCKING HIM TO THE GROUND AND RUNNING OVER HIS LEG

THE OTHER WORKER SHOUTED TO THE DRIVER WHO PANICKED AND REVERSED THE FORKLIFT TRUCK OVER HIS CO-WORKER'S LEG ONCE AGAIN
WHAT HAPPENED?

THE COMPANY WAS FINED £36,000

AFTER PLEADING GUILTY TO BREACHING

SECTION 2 OF THE HEALTH AND SAFETY AT WORK ACT.

CORRECTIVE MEASURES WERE MADE TO WORKING PROCEDURES

AFTER THIS ACCIDENT TOTALLING £4,500
HOW CAN YOU ENSURE
THE SAFETY OF PEDESTRIANS
WHILST IN THE PROXIMITY
OF FORKLIFT TRUCKS?
IT IS THE FORKLIFT TRUCK OPERATOR'S RESPONSIBILITY TO WATCH OUT FOR PEDESTRIANS NOT THE OTHER WAY AROUND
PROVIDE SUFFICIENT CLEAR AND UNAMBIGUOUS WARNING SIGNS AT STRATEGIC LOCATIONS TO INFORM PEOPLE FORKLIFT TRUCKS OPERATE IN THE AREA.
DEFINE,

DESIGNATE AND

CLEARLY MARK

PEDESTRIAN ROUTES AND CROSSING PLACES
WHERE POSSIBLE PEDESTRIANS SHOULD BE SEGREGATED FROM VEHICLE ROUTES BY A PHYSICAL BARRIER
USE THE MANUALLY OPERATED HORN IN SEVERAL SHORT BURSTS AT BLIND CORNERS TO ATTRACT ATTENTION
FLASHING BEACONS / SAFETY LIGHTS ARE EFFECTIVE AS A WARNING DEVICE ESPECIALLY TO OTHER FORKLIFT TRUCKS
HIGH VISIBILITY CLOTHING OR LIGHT COLOURED OVERALLS FOR BOTH OPERATORS AND PEDESTRIANS
EMPLOYEES SHOULD ALSO STAND CLEAR BEHIND THE FORKLIFT TRUCK WHERE THEY MAY NOT BE FULLY VISIBLE TO THE DRIVER.
THE SIZE OF THE LOAD CAN OBSCURE VIEW,

IN THIS CASE DRIVE IN REVERSE
IT IS FORBIDDEN TO CARRY PASSENGERS
AND FINALLY...
IT IS GOOD PRACTICE TO DRIVE AT LEAST THREEL TRUCK LENGTHS BEHIND ANOTHER FORKLIFT TRUCK
“CHERRY PICKER”

THE LIFTING OPERATIONS AND LIFTING EQUIPMENT REGULATIONS (LOLER) 1998

PROHIBIT
PLANNED MAINTENANCE OPERATIONS

TO BE CARRIED OUT BY AN FORKLIFT TRUCK
• PAINTING
• CLEANING
• MAINTENANCE
• STOCKTAKING
• ORDER PICKING

• NON-Routine, IMPractical TO HIRE PURPOSE BUILT EQUIPMENT

• LESS SAFE MEANS “LADDERS” NON ROUTINE, IMPRACTICAL

• CHECKING HIGH LEVEL DAMAGE TO RACKING WHICH POSES IMMEDIATE RISK OR DAMAGED ROOF LIGHTS
ENSURE THE FORKS ARE LOWERED AND TILTED FORWARD WHEN PARKED

PARKING BRAKE ON TURNED OFF WITH THE KEY TAKEN OUT TO PREVENT UNAUTHORISED PERSONNEL FROM USING THE FORKLIFT TRUCK
GROUP EXERCISE

DO YOU HAVE THE KNOWLEDGE TO OPERATE A FORKLIFT TRUCK?

CAN YOU SPOT THE HAZARDS
Perfect Fork Lift Experience Impact results 2014

Project launch week 27