

Service Engineers Safe Working Procedures

(Plastic Injection Moulding Machines)

**This document has been created, and adopted, by
the following UK companies:**

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Contents

1	HEALTH AND SAFETY POLICY REGARDING THE WORKING OF LONG HOURS, DRIVER FATIGUE AND USE OF MOBILE PHONES IN VEHICLES	3
1.1	Working Hours Policy	3
1.2	Driver Fatigue and Road Accidents	3
1.3	Mobile Phones and Driving	4
2	SITE ARRIVAL AND DEPARTURE GUIDELINES	6
2.1	Site arrival procedures	6
2.2	Risk assessments	7
2.3	Prior to leaving site	7
3	REPORTING PROCEDURES	8
3.1	Site Contact	8
3.2	Communications	8
3.3	Dangerous Occurrences	8
3.4	Health and Safety Report	8
3.5	Leaving site	8
4	ETIQUETTE FOR SERVICE ENGINEERS	9
4.1	Presentation	9
4.2	How you look	9
4.3	How you act	9
5	RISK ASSESSMENT FOR SERVICE OPERATIONS AT CUSTOMER PREMISES	10
5.1	Introduction	10
5.2	Risk Assessment	10
5.3	Typical Hazards	10
5.4	Risk control	11
5.5	Residual risk and risk assessment	12
6	PERSONAL PROTECTIVE EQUIPMENT	13
6.1	Typical Hazards	13
6.2	Risk control	13
6.3	Residual risk and risk assessment	13

1 Health and Safety Policy regarding the working of long hours, driver fatigue and use of mobile phones in vehicles

1.1 Working Hours Policy

- 1.1.1 A safe working day should consist of no more than 12 hours, including both working hours and travelling hours. Any hours worked in excess of this must be at the discretion of the engineer, who should take into account the stress that he/she has been under and the cumulative total hours that he/she has worked in the recent past. If the working day will exceed 12 hours then the company recommends that the engineer should stay in a hotel. A 20-minute break is recommended for every 6 hours of work. A short break of up to 15 minutes is strongly recommended for every 2 hours of driving or when feeling tired.

1.2 Driver Fatigue and Road Accidents

Acknowledgment: Much of the following text has been taken from the ROSPA web site.

- 1.2.1 Drivers should avoid driving when sleepy, when they would normally be sleeping or when they are ill or taking medication that contra-indicates driving or using machinery. It is crucial that drivers plan journeys, especially long ones involving driving on motorways or other monotonous roads.

Drivers:

- Ensure that you are well rested, and feeling fit and healthy (and not taking medication which contra-indicates using machinery), before starting long journeys
- Plan the journey to include regular rest breaks (at least 15 minutes every two hours)
- If necessary, plan an overnight stop
- Avoid setting out on a long drive after having worked a full day
- Avoid driving into the period when you would normally be falling asleep
- Avoid driving in the small hours (between 12am and 6am)
- Be extra careful when driving between 2pm and 4pm, especially after having eaten a meal
- If feeling sleepy during a journey stop somewhere safe, take drinks containing caffeine and take a short nap

1.2.2 Background

Driver fatigue is a serious problem resulting in many thousands of road accidents each year. Research shows that up to 20% of accidents on monotonous roads, such as motorways, in Great Britain are fatigue related. Research in other countries also indicates that fatigue is a serious problem.

Sleepiness reduces reaction time (a critical element of safe driving). It also reduces vigilance, alertness and concentration so that the ability to perform attention-based activities (such as driving) is impaired. The speed at which information is processed is also reduced by sleepiness. The quality of decision-making may also be affected. It is clear that drivers are aware when they are feeling sleepy, and so make a conscious decision about whether to continue driving or to stop for a rest. It may be that those who persist in driving underestimate the risk of actually falling asleep while driving. Or it may be that some drivers choose to ignore the risks (in the way that drink drivers do).

Young male drivers, truck drivers, company car drivers and shift workers are most at risk of falling asleep while driving. The early hours of the morning and the middle of

the afternoon are the peak times for fatigue accidents, and long journeys on monotonous roads, particularly motorways, are the most likely to result in a driver falling asleep.

1.2.3 Evidence

A study by the Sleep Research Centre at Loughborough University indicates that driver fatigue causes up to 20% of accidents on monotonous roads. This suggests that there are several thousand casualties each year in accidents caused by drivers falling asleep at the wheel.

A study of road accidents between 1987 -1992 found that sleep related accidents comprised 16% of all road accidents, and 23% of accidents on motorways. Research found slightly lower proportions of sleep related accidents: 9%-10% of accidents on all roads, and 15% of accidents on motorways involved driver sleepiness. In this study, 29% of drivers reported having felt close to falling asleep at the wheel at least once in the previous twelve months.

1.2.4 The Law

It is not a specific offence to drive when tired, however a driver is more likely to commit a driving offence whilst tired. This may be as significant as causing death by dangerous driving and there has recently been a successful conviction of a driver who fell asleep at the wheel.

The Highway Code gives the following advice:

80. Driving when you are tired greatly increases your accident risk. To minimise this risk
- Make sure you are fit to drive. Do not undertake a long journey (longer than an hour) if you feel tired.
 - Avoid undertaking long journeys between midnight and 6am, when natural alertness is at a minimum
 - Plan your journey to take sufficient breaks. A minimum break of at least 15 minutes after every two hours of driving is recommended
 - If you feel sleepy, stop in a safe place. Do not stop on the hard shoulder of a motorway
 - The most effective ways to counter sleepiness are to take a short nap (up to 15 minutes) or drink, for example, two cups of strong coffee. Fresh air, exercise or turning up the radio may help for a short time, but are not as effective.

1.3 Mobile Phones and Driving

1.3.1 No driver should use a mobile telephone or any similar piece of telecommunications equipment while driving company vehicles, or their own vehicles, on company business unless using hands free equipment that fully complies with current legal requirements. Such use is likely to distract the driver from the main task of managing the vehicle in a safe and competent manner and be prejudicial to road safety. For further guidance on the use of mobile phones while driving please refer to your specific company policy

1.3.2 The Law

The Highway Code now specifically warns drivers that they **MUST** be in proper control of their vehicle at all times, and strongly advises drivers not to use mobile phones (and other equipment) while driving. See page 32, sections 127 & 128.

Regulation 104 of the Construction & Use Regulations indicates that drivers may face prosecution if they are not at all times in proper control of their vehicle. This regulation has already been used as the basis for prosecution by police officers nationwide.

(extract from The Highway Code 2003)

Mobile phones and in-car technology

127

You **MUST** exercise proper control of your vehicle at all times. Never use a hand held mobile phone or microphone when driving. Using hands free equipment is also likely to distract your attention from the road. It is far safer not to use any telephone while you are driving - find a safe place to stop first.

Laws RTA 1988 sects 2 & 3 & CUR reg 104

128

There is a danger of driver distraction being caused by in-vehicle systems such as route guidance and navigation systems, congestion warning systems, PCs, multi-media, etc. Do not operate, adjust or view any such system if it will distract your attention while you are driving; you **MUST** exercise proper control of your vehicle at all times. If necessary find a safe place to stop first.

Laws RTA 1988 sects 2 & 3 & CUR reg 104

2 Site Arrival and Departure Guidelines

2.1 Site arrival procedures

2.1.1 The engineer will report to the designated contact person at the customer site, this is normally the contact provided by the customer, when the request to attend site was made.

2.1.1.1 The engineer is required to sign in according to customer procedures; this may include confidentiality agreements etc.

2.1.1.2 Any identification or badges provided must be displayed at all times while on site.

2.1.2 The customer's representative must advise the engineer of any special health and safety requirements or rules which maybe in force within the company. This would include but is not limited to:

- Parking locations and restrictions.
- Site speed limits.
- Limitations concerning smoking, alcohol and drugs.
- Limitations concerning food and drink.
- Limitations and procedures relating to Hygiene

2.1.3 The customers representative must ensure that the engineer is aware of the companies emergency procedures, this would include but is not limited to:

- Fire and evacuation.
- First aid
- Means of contacting customer's representative in an emergency.
- Accident and Incident reporting (including "near-miss")
- Welfare facilities.

2.1.4 The engineer has been provided (see Personal Protective Equipment List in Section 6) with and will wear appropriate personal protective equipment, safety shoes, safety glasses etc. where necessary.

2.1.5 When working on a machine all precautions deemed necessary for the safety of the engineer and also for the safety of the employees within the company will be carried out. This includes but is not limited to:

2.1.5.1 Ensuring that all "Customers Permit to Work" procedures are complied with.

2.1.5.2 Ensuring a warning sign, where considered appropriate, is prominently displayed on the machine with.

2.1.5.3 Where working on the electricity supply or hydraulic systems the mains isolator may be padlocked, if deemed appropriate by the engineer according to the specific conditions encountered and/or risk assessment undertaken. The emergency stop button should also be actuated. For fault finding activities it may be necessary to work on a "live" machine. This activity will be subject to the Risk Assessment procedure. A safe working environment must be established before work commences.

2.1.5.4 There should be sufficient free space all around the machine to allow for easy access.

2.1.5.5 When working at a height above 2 metres the customer should provide a safe means of access.

2.1.6 While working on customers site, engineers can be expected to:

- Maintain high standards of housekeeping
- Keep exits and gangways clear
- Dispose of waste correctly and carefully
- Keep noise and dust to a minimum
- Not use foul or abusive language

2.2 Risk assessments

2.2.1 Prior to work commencing, all work to be carried out will be subject to a risk assessment. The results of the assessment will vary depending on the nature of the work to be carried out. The conclusion of the risk assessment may identify risks, which cannot be eliminated or reduced to a safe level. If this is the case the engineer will discuss the assessment with his site contact and work will not commence until risks have been mitigated to a satisfactory level (refer to Section 5).

2.3 Prior to leaving site

2.3.1 On completion of the work the engineer will check that the machine can be safely returned to production.

2.3.2 The work carried out should be approved and signed off by the customer before the engineer leaves site. The engineer will also ensure that:

- All customer permits to work are signed off.
- The work area is clean and tidy.
- All equipment is returned or removed.
- Customer's departure procedures are completed (sign out etc.)

3 Reporting Procedures

3.1 Site Contact

- 3.1.1 It is the responsibility of the engineer to ensure he makes himself known to management on site. The engineer should ensure the contact is either designated by his office or is in his opinion a suitable contact source in case of need. This contact is considered the “site manager”. All documentation and procedures required of the engineer, by the customer, should be understood and adhered to.

3.2 Communications

- 3.2.1 All communication relating to a project will be conducted through the appointed site manager. Risk analysis of the project will be an ongoing and continuous process and any significant risk will be notified to the site manager immediately who has the responsibility to ensure that all persons involved or likely to be involved in the project are aware of the risk and the action required.

3.3 Dangerous Occurrences

- 3.3.1 Any event or incident that might have caused a serious accident will be reported to the site manager and also reported to the head office of the engineer as soon as possible.

3.4 Health and Safety Report

- 3.4.1 The engineer should satisfy himself that the project he has been working on meets all the current health and safety standards. Any equipment that is dangerous or does not meet these standards should be reported to the site manager and the engineers head office immediately. A written report should be supplied to both the site manager and the engineers head office.

3.5 Leaving site

- 3.5.1 The site manager should be made aware that you are leaving site. All relevant procedures and actions required by the customer should be followed. Where at all practicably possible the engineer should sign off site. He should also inform head office before leaving site.

4 ETIQUETTE for Service Engineers

4.1 Presentation

- 4.1.1 Remember **FIRST IMPRESSIONS** count; your appearance makes an immediate impression on others.
- 4.1.2 Service engineers are representatives of the company, how they look and act reflects not only on them personally but on the image and reputation of the company.
- 4.1.3 Always present yourself correctly and act in the best interests of the customer and the company.
- 4.1.4 Your image as a person and an engineer is influenced by how you look and how you act.

4.2 How you look

- 4.2.1 Always look presentable, make sure that you are clean and dressed in an acceptable manner.
- 4.2.2 Although an engineer's job can be dirty you should still turn up dressed correctly when you present your self to the customer. When you start work on the machine is the time to change into your "working" clothes, if necessary.

4.3 How you act

- 4.3.1 Always arrive with a positive attitude.
- 4.3.2 Arrive on site at a "reasonable" time; if you are delayed then explain the reason.
- 4.3.3 Carry out your work in an efficient and professional manner.
- 4.3.4 When you have completed your work inform the customer, tidy up after yourself and depart leaving a favourable impression in the mind of the customer.
- 4.3.5 In essence the impression you make is totally under your control, look presentable, act in a positive manner and you will leave the customer with the right impression of your attitude and ability.

5 Risk Assessment for Service operations at customer premises

5.1 Introduction

- 5.1.1 Due to the many and varied activities undertaken by service engineers pre-defined risk assessments are not practical. The following generic risk assessment is provided which in our opinion covers all normal service operations. Should an exceptional activity be identified that is regarded as not being adequately covered then a specific risk assessment and/or method statement may be considered. Service personnel are, however, encouraged to undertake a mental risk assessment before commencing work.
- 5.1.2 The Health and Safety at Work Act 1974 imposes a statutory duty on employers to ensure in so far as is reasonably practicable the health and safety of their employees whilst at work. This duty also extends to others who may be affected by that work. Customers therefore have a duty of care towards service personnel while on their premises. A safe working environment should be provided without risk to health and adequate provision made for their welfare. There should be safe access to and egress from the workplace.
- 5.1.3 Employees also have a statutory duty to take care of themselves and others who may be affected by their acts or omissions. Service personnel therefore have a duty of care towards those around them.

5.2 Risk Assessment

- 5.2.1 The following generic risk assessment covers most regular service activities on injection moulding machines including but not exclusive of:
- Commissioning, training, calibration, retrofit modifications and repairs to mechanical, hydraulic and electrical aspects of the machine.

5.3 Typical Hazards

- 5.3.1 Slips, trips and falls
- 5.3.2 Mechanical
- 5.3.3 Electrical
- 5.3.4 Burns
- 5.3.5 Processing
- 5.3.6 Fire and/or explosion
- 5.3.7 Pressurised system
- 5.3.8 Noise
- 5.3.9 Hazardous substances
- 5.3.10 Working conditions (lighting, dust, ventilation, temperature, gangways, vehicle movements and overhead operations)
- 5.3.11 Working at height

5.3.12 Manual and assisted handling

5.3.13 Working alone

5.4 Risk control

5.4.1 Before commencing work the area around the machine should be clear of trailing cables, granulate, oil and any item that may cause a slip, trip or fall.

5.4.2 Gangways should be kept clear and engineers should be aware of any overhead activities that may affect them or their work.

5.4.3 Engineers should be aware of emergency (e.g. fire), first aid and accident procedures and how to contact their on-site liaison or appointed person.

5.4.4 Containment materials in the event of oil or granulate spillage should be available or their near location established before commencing work.

5.4.5 Establish if any portable or ancillary equipment is connected to the machine which may affect the operation elsewhere and possibly cause risk to others by stopping or starting due to isolation and reconnection of the subject machine.

5.4.6 Be aware of moving vehicles, for example, forklift trucks in gangways.

5.4.7 The customer must provide safe working and environmental conditions, for example, adequate light, ventilation, temperature and reasonably dust free. The engineer must not create unsafe conditions for those in the vicinity.

5.4.8 P.P.E. must be used as appropriate (see Section 6). Should local conditions necessitate the use of additional equipment the engineer should discuss with his manager and/or customer safety representative, for example, full face mask when purging. Hydraulic mineral oil may cause skin disorders such as dermatitis or possibly cancer. Inhalation of oil mist may potentially lead to respiratory problems.

5.4.9 No hazardous substances may be introduced onto customer premises without knowledge of and access to C.O.S.H.H. data sheets.

5.4.10 Assistance should be sought when lifting heavy or awkward shaped materials, equipment or loads. Mechanical assistance including the use of fork lift trucks and overhead cranes should be utilized where appropriate but slinging and operation should be by customer approved personnel only.

5.4.11 When working at a height above 2 metres the customer should provide a safe means of access.

5.4.12 Pressurised systems such as accumulators must be discharged before working on them and the circuits they are connected to. Should the work in progress necessitate the use of a compressed air line then P.P.E. should be used.

5.4.13 Mechanical work may involve lifting heavy or awkward items (5.4.10) also pinch and shear hazards may occur. Use P.P.E. where applicable (5.4.8).

5.4.14 Electrical work hazards include electrocution and fire. Risk is controlled by use of P.P.E. if necessary and training. Where possible soldering operations should be undertaken in an area of good ventilation.

5.4.15 Engineers should be aware of the material being processed and its related hazards, for example toxic or explosive properties and maximum time permitted in cylinder. If

unfamiliar with the material or in doubt make use of the customer's authorised personnel to purge or start up/shut down the machine.

- 5.4.16 Working with or near hot surfaces or parts creates a burns hazard. Use appropriate P.P.E. (5.4.8) and be aware of first aid facilities (5.4.3).
- 5.4.17 Should engineers be placed in a situation where they have to work alone and it is considered safe for them to do so they should arrange with the customer to make regular welfare checks.

5.5 Residual risk and risk assessment

- 5.5.1 Trailing leads, poor access and unfamiliarity with customer premises layout can lead to incidents that cannot be completely eliminated. The control measures above should minimise the risk to an acceptable level. **Medium**
- 5.5.2 There is a risk of injury arising from service engineers being placed in situations of risk as a result of poor working conditions on customer sites, or poor control of work practices and equipment. **Medium**
- 5.5.3 Customer personnel could be at risk from the actions of our engineers operations. This is minimised by communication and implementation of safe working practices. **Low**
- 5.5.4 Use of a compressed air supply is infrequent and of short duration. Control measures should minimise the risk to an acceptable level. **Low**
- 5.5.5 Use of hazardous materials brought onto site by the engineer is minimal and infrequently used, for example, aerosols. Control measures are considered adequate. **Low**
- 5.5.6 Manual handling risks if controlled are minimised. **Low**
- 5.5.7 A potential risk from the use of plant and equipment will always exist. Engineers are trained to standards established by the company to minimise this risk and they should not operate customer's equipment for which they are not trained and have no permission. Adequate tools, instructions and equipment are provided. **Low**
- 5.5.8 P.P.E. is necessary due to the nature of work undertaken by service personnel and should be maintained or replaced as necessary. **Low**
- 5.5.9 All service personnel have experience in the mechanical, hydraulic and electrical operation and repair of injection moulding machines and training is maintained to ensure competency. **Low**

6 Personal Protective Equipment

6.1 Typical Hazards

- 6.1.1 Mechanical
- 6.1.2 Noise
- 6.1.3 Hazardous substances
- 6.1.4 Temperature

6.2 Risk control

- 6.2.1 All engineers are provided with as standard or on request as free issue:
- Protective overalls, safety shoes, safety glasses, earplugs, ear defenders, cotton gloves, latex gloves, high temperature gloves and dust respirator mask.
 - The P.P.E. utilised must be adequate to control the risk of injury.
 - Engineers are required to wear the P.P.E. available and replace items that are no longer suitable for the purpose supplied.

6.3 Residual risk and risk assessment

- 6.3.1 Personal protective equipment is necessary according to the nature of work being undertaken and the varying standards of housekeeping and environmental conditions engineers may find themselves working under.
The risk assessment if P.P.E. is correctly used is considered **LOW**.

Personal Protective Equipment at Work Regulations

Below are listed some key extracts from those regulations:

Reg. 4 (1) every employer shall ensure that suitable PPE is provided to his employees who may be exposed to a risk to their health or safety while at work except where and to the extent that such risk has been adequately controlled by other means which are equally or more effective.

Reg. 4 (3a) PPE shall not be suitable unless it is appropriate for the risk or risks involved and the conditions at the place where exposure to the risk may occur.

Reg. 7 (1) every employer shall ensure that any PPE provided to his employees is maintained (including replaced or cleaned as appropriate)

Reg. 9 (1a) where an employer is required to ensure that PPE is provided to an employee, the employer shall also ensure that the employee is provided with such information, instruction and training as is adequate and appropriate to enable the employee to know the risk or risks which the PPE will avoid or limit and b) the purpose for which and the manner in which PPE is to be used.

Reg. 11 every employee who has been provided with PPE by virtue of regulation 4 (1) shall forthwith report to his employer any loss or obvious defect in that PPE.

The Personal Protective Equipment at Work Regulations came into force on 1st January 1993. Personal protective equipment should be considered a last resort and only used where safe systems of work cannot be implemented. Hazards should wherever possible be removed or minimised to acceptable levels.

All PPE must fit correctly without hindrance, for example, free movement, should take into account the health of the user and not itself increase the overall risk.