

Delphi Machinery and Equipment Health and Safety Checklist (ME 3.9.4-2)

Equipment Name		Asset Tag #	
Supplier's Name			
Plant and Department Location			
Completed By			
		Common Core Element Link: http://osg.delphiauto.net/health_safety/CCE.asp	
Items To Check:	Review at Equip. Supplier	Review at Delphi Plant	Comments (supplier and plant review) If any response is "No" then list Action Plan and Owner
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1. General		-Equipment Risk Assessment Tools	-EH S and Validation Document Storage Site
Meets all current Delphi Thermal standards per specifications list? This includes all national and/or international standards and addendums where applicable.			
Has a risk assessment been performed on each piece of equipment per DA-2006 requirements and been posted to the EH&S / Validation document warehouse?			
Are all safety labels for hazards in place such as electrical, pinch point, hot surface? Any area containing a hazard must have the appropriate warning label attached on the associated guarding.			
Operators have been trained on proper use/operation?			
Are required safety signs installed?			
If additional fire suppression systems are required are they installed and operating?			
Safe work procedures/placard (s) are posted on the machinery/equipment?			
Walking surfaces are free from obstacles and meet load requirements?			
Floor openings guarded or covered?			
2. Industrial Hygiene (Noise, PPE, Ventilation, Dusts, Heat Stress)		-IH SL1 Specification	
Process exhaust ventilation required? (See DHS Section 7.2)			
Has the ventilation been added to preventative maintenance system?			
Volumetric flow rate indicators installed?			
Is Additional building supply ventilation installed, if required?			
Is coolant / oil mist control system (s) installed, if required? (See DHS Section 7.3)			

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Has all equipment met the ≤ 80 decibel (dBA) SL1 Sound Level Specification requirement and checklist posted at the EH&S SharePoint? (See DHS Section 7.4).			
Have heat stress or cold stress conditions been reviewed and resolved, if required?			
Is there a combustible dust hazard (includes nano technology) (See Ind Hyg Notice)			
3. Radiation Sources -IH SL1 Specification			
Ionizing radiation source / device present? (See DHS Section 7.6)			
If so, has the site Radiation Safety Officer (RSO) been consulted? Provide name.			
Non-ionizing radiation emissions? (UV, IR, RF, microwave) (See DHS section 7.6)			
4. Lasers -IH SL1 Specification			
Are lasers installed on this machinery/equipment? If no, skip section and enter NA..			
A trained Laser Safety Officer (LSO) is required for all Class 3B or Class 4 lasers or laser systems with embedded Class 3B and 4 lasers. Has one been identified / trained? If so add persons name in comment section.			
LSO contacted to assure <u>all other</u> Delphi laser safety program requirements have been, or will be, met?			
Equipment safety features specified / installed?			
Room safety features associated with an open beam laser system specified / installed?			
Personal protective equipment required / specified / provided?			
Safe Operating Procedures developed (includes normal operation, maintenance, and beam alignment)?			
Laser safety placard and information form developed / posted?			
Laser generated air contaminants controlled?			
Regulatory notification requirements met?			
5. Dangerous Goods (DG) (incoming materials or outgoing product or waste) Dangerous Goods Corporate Sharepoint			
Are DG going to be used with this machine/equipment? If not sure contact DfEH&S Engineer. If no, skip section and enter NA.			

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Have the DG environmental / safety subject matter expert been contacted to assure compliance to governmental / Delphi safety standards?			
Has a governmental permit been issued to use explosive devices?			
Has the plant contacted the local governmental authorities to inspect the area where the DG will be used?			
Have DG holding containers been installed?			
Are protective explosive guards/barriers in place?			
Has a safe operating procedure been implemented on how to use/store DG?			
Have employees been trained on how to use/store DG properly?			
Have DG personal protective equipment been provided to the operators?			
6. Chemicals / Raw Materials			
-Material Authorization Request System			
Has each material been through MARS system and been approved for use (CMAP and Hazardous Material Control Committee)? (If yes enter approval number in comments section)			
Air sampling plan updated if required?			
HMCC "conditional approval" items implemented, if applicable?			
Material Safety Data Sheets provided and posted on MSDSnet			
Are there any nano-materials being specified (see appropriate OSG bulletin on special hazards)?			
Safe Use Instructions provided?			
Personal protective equipment required? (See CCE #12)			
Emergency eyewash or safety shower required? (See H&S BMP)			
Compatibility with on site storage areas for wastes and raw materials?			
Storage area provided?			

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Containers properly labeled and storage area properly labeled ?			
7. Ergonomics -Ergo Checklists			
Are checklists completed and posted on EH&S document warehouse site?			
Meet height requirements for receiving Region/Plant specifications?			
Meet lifting guidelines?			
Cycle time identified?			
Within operator posture limitations?			
Within operator force limitations?			
Ergonomic mat properly installed, if applicable?			
8. Fixed Guarding			
Is a safety fence / barrier provided?			
Are guards free from burrs, sharp edges, and sharp corners?			
Does guarding safely contain all material within the guarded area in case of mechanical failure?			
Do guards contain coolant or lubricant splash?			
Do guards permit proper visibility where necessary?			
Do guards create a hazard or interfere with normal operation of the equipment?			
Are easy open barrier guards (which cover pinch points) interlocked?			
Are guards hinged whenever possible and designed in such a manner that neither counter balance nor other mechanical aids are required to open/hold/close them?			
Do the barrier guards installed eliminate all pinch points?			
Are all drive unit apparatus such as belts, cylinders, chains, sprockets, gears, and shafts totally enclosed?			

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Are all shear, crush, pinch and coupling drive flanges completely guarded?			
Are all turnover or rollover fixtures adequately guarded to stop access?			
Where suspended counterweights are used and not guarded by location, are they enclosed?			
9. Electric, Controls, Lockout and Electrical Safe Guarding Controls COE SharePoint			
Adhere to NFPA 79 or IEC 60204?			
Are electrical drawings provided.			
Properly sized circuit protection for existing loads?			
Proper interlocking used for guarding of hazardous locations?			
Disconnecting means lockable in the OFF position ONLY and interlocked w/ enclosure?			
IE 60204: Supply voltage using an attachment plug to supply the machine power must be 250 volts to ground or less and have a full load current 20 amps or less? Cannot plug or unplug while energized (interlocking plug)			
NFPA 79: Supply voltage using an attachment plug to supply the machine power must be 150 volts to ground or less and have a full load current 20 amps or less? Cannot plug or unplug while energized (interlocking plug)			
AC control circuit voltage must be supplied by a transformer with an isolated secondary winding instead of obtained directly from the incoming 220 volt supply?			
10. Lock-out /Hazardous Energy Control Controls COE SharePoint			
Are all sources of energy clearly labeled?			
Does Controls Lockout Solution (CLU) in lieu of lockout if yes is there CLS task placards (labeling , validation etc.) posted at each entry point.			
Hazardous energy procedure / placard posted?			
Single energy source sticker required?			
Lockable electrical, air, nitrogen, helium, hydraulic lines/valves (dump valves if gas or air) within 6 1/2 ft to the floor?			
11. Electricity Controls COE SharePoint			
All wiring meets Delphi Control standards (including properly sized or colored wires being used and wire numbers at both ends of the conductors)?			
Properly fused?			

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Ground fault interrupters required/installed?			
Raceways filled at acceptable limits?			
Labeled to identify electrical arc flash potential and PPE requirements (for US only)?			
Is 3 feet of working space provided in front of electrical closures? Ensure electrical cabinets are not blocked and free access is provided.			
Have proper, predictable tests /documentation of the electrical and fluid controls been performed?			
12. Controls Controls COE SharePoint			
Does the control safety circuit meet all requirements outlined in the DHS 1.0 for the Application of Light Curtains? (COE Controls site)			
Does light curtain installation conform to proper "safe distance" requirements and have they been posted on the EH&S/ Validation warehouse site?			
Has light curtain application been entered into preventative maintenance tracking system?			
Is proper mechanical guarding in place to prevent reaching around light curtain into unsafe area?			
The control circuit grounded instead of floating? Ground the neutral side of the step down transformer secondary when used. A zero reference point is also desired for DC.			
Anti tie down/anti repeat circuitry verified?			
Manual controls provided?			
Master Start/Stop circuitry and Emergency Stop circuitry properly done? In most cases a reset is required when dropping out the control power with the stop or emergency (EMO), (no movement or hazard shall be generated when resetting the Emergency Stop button or safety circuit).			
Emergency stops - stop all motion and are red mushroom with yellow background?			
Cycle stops - verify stop upon completion of a cycle?			
Master stops – verify shuts off machine/equipment power?			
All valves labeled as to function and print number?			
All controls have been labeled and numbered for operations sequence?			

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Considerations given to handle excessive heat in the control enclosure (know the operating temperature extremes in the final location and the heat dissipation of the enclosure and equipment process area)?			
Appropriate safety relay or module used for any safety circuit?			
All of the components finger safe or properly protected? See NFPA 79 for the tool dimensions for determining finger safe components and applications.			
Control voltage 24 volts DC as required?			
Audible operator signals provided on conveyors, assembly lines, transfers, etc.?			
Test Sequence: For a non Delphi common device (off the shelf), has a proper test sequence been developed and tested for: cell lockout / perimeter guarding / E-stop, reset and power on / power device duplication and monitoring / perimeter guard interlock/ teach pendant verification / enabling pendant / point of operation safeguarding device / pinch point safeguarding device? See Annex B of Design-in H&S specification.			
13. Robots			
Are robots a part of this machinery/equipment? If no skip section and enter N/A.			
Are robot warning indicator lights installed to forewarn employees what mode the robot is in?			
Are protective barriers in place and interlocked to keep people from entering the robotic cell while the robot is in automatic mode?			
Are there 28 inches from the extended robot arm with part and the protective barrier?			
Is there a teach pendent to the robot equipped with a energy stop device?			
Are there any blind areas inside the robot cell?			
Is the robot entrance gate equipped with electrical interlocks to stop the robot automatic motion when the gate is open?			
Has a safe operating procedure been written to: use the robot, clean the robot area, and conduct maintenance tasks?			
Have employees been trained on how to operate, teach, service and conduct maintenance tasks on the robot?			
Have employees been instructed to check to verify that the robot responds to all pendant control commands before entering the robot cell?			
14. Confined Space			
Is there a Confined space as a part of this machinery/equipment? If no skip section and enter N/A.			

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Labeled and numbered?			
Evaluated for permit/non-permit required?			
Potential chemical & physical hazard (s) identified on the Equipment Risk Assessment Hazard Analysis form?			
Recorded on Plant's Confined Space Log?			
15. Platforms, Ladders, Steps			
Is all work at floor/ground level? Work or maintenance areas higher than 6 feet introduce a fall hazard and should be avoided. If fall hazards could not be avoided verify that a proper means of Fall Protection is installed and implemented.			
Do treads have non-slip surfaces?			
Are hand rails provided?			
Are mid rails provided?			
Are toe boards, 4" high (above 48" elevation)?			
Is a safety gate at fixed ladder/platform entrance/exit?			
Are top platform railings 42" high?			
Floor openings guarded or covered?			
Walking surfaces are free from obstacles and meet load requirements?			
16. Work Place Organization plan implemented			
Tools in marked spots?			
All required equipment in designated locations?			
Skid/hopper/rack locations designated - visually marked?			
17. Utilities / Facilities			
http://osg.delphiauto.net/			
a. Maintenance			
Complete preventive maintenance (PM) information available?			

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Does the "Design" comprehend ease of maintenance and performing PM's? Design shall be done to minimize downtime by eliminating obstructions and hardwired components.			
No tool-guarding removal with safety interlocks for frequent access? Hazardous areas requiring frequent access shall have safety guard doors with properly applied interlocks. The use of a tool to access shall be avoided.			
No special tools required? Special tools are expensive to purchase and distribute therefore the use of them shall be avoided.			
Self Maintenance-Auto PM's-oilers, greasers? Auto oilers or grease manifolds with appropriately documented PM preferred.			
Visual identification or color coding where applicable. Examples are yellow/black stripes when guards are removed. Green background for normal operating range - red for hazard.			
Gauges (operating range), rotation on motors/pumps marked. Arrange gauges to point the same directions during Normal operations. Red directional arrows for all shaft or motor driven items.			
Pipes, hoses shall be color coded by type and directional flow. Indicate by color - air, water, fluid piping and direction of flow arrows.			
Lubrication points and lubrication type identified. A lubrication manifold shall be used when multiple lubricating points exist. All points of lubrication shall be labeled with type as well			
Are all Housekeeping requirements identified/minimized? Eliminate or guard areas susceptible to collecting debris, dirt or dropped parts. Provide access to those areas that can't be avoided.			
Preventative Maintenance requirements set-up in local PM system.			
System prints for the following 4 areas provided and current?			
1. Electrical			
2. Pneumatic			
3. Hydraulic			
4. Mechanical including water, gas, steam, ventilation, lubrication, coolant/quench etc			
Preventative maintenance sheets have been provided?			
Has equipment been entered in PM program at plant?			
Maintenance has been trained on proper use / operation per instructions?			
b. Compressed Air			

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Hand held max 30 PSI and vented?			
Mechanical brakes on air cylinders operate correctly?			
Properly labeled and color coded?			
Does not create a safety hazard when de-energized? (i.e. dump valve operating properly)			
c. Water / Water Lines			
Process water required? (See DHS Section 7.7)			
Properly labeled and color coded?			
Back flow preventer (s) required?			
d. Gas Lines			
Properly Labeled and color coded?			
Direction Flow identified?			
Pressure identified?			
Proper safety valves with exhaust?			
Safety instructions in place?			
Training plan written for implementation of new gas fueled equipment?			
e. Hydraulics			
Clearly labeled and color coded gages?			
Does not create a safety hazard when de-energized (proper safety valves in place)?			
f. Steam			
Properly labeled and color coded?			
Direction flow identified?			

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Pressure identified?			
18. Training			
Training described in Job Instruction and Statement of Work?			
Operator and Maintenance training videos available?			
Training on the equipment completed?			
Training on the chemicals and raw materials completed?			
Training department notified?			