

BI-02A.50 Hydraulic line specifications are detailed for mobile equipment

(Accountable - Engineering Manager (Site) (Unassigned))

Expectations

Hydraulic line design requirements should be included in specifications provided to OEMs/Suppliers and site maintainers. This material should meet site requirements to prevent ignition of flammable materials and maintain integrity (i.e. not leak) during operation (including abnormal/emergency situations) and maintenance inspections/proof testing.

Specify

Hydraulic line design requirements:

- Segregation of high energy circuits
- Supported to prevent damage due to vibration, abrasion, and rubbing
- Routing of lines addresses fire exposure considerations
- The twisting or movement of the machine including attachments is considered
- Separate from any part of the machine which can reach 80 % of the flashpoint temperature of the design/recommended hydraulic fluid
- Clamp arrangements are identified as optimal - avoiding clamps (e.g. P clamps) which can accelerate wear of sheathing materials on hoses and cables
- Cover or protect lines to prevent flammable fluid under pressure contacting hot surfaces
- Hose temperature capability greater than expected operating environment temperature
- Fire resistant hydraulic hoses and components that self- extinguish within 30 s of removal of the flame in accordance with ISO 8030
- Four times operating pressure safety factor for the hose assembly including end fittings

- Coal applications require hydraulic hoses and their components to be in accordance with ISO 6805.

Hoses close to the operator

- Hoses that are located within 1 metre of the operators with a pressure exceeding 5 MPa or a temperature exceeding 60 °C shall be guarded as detailed in ISO 3457
- Guards includes equipment parts and components

Maintenance and Operations

- To avoid errors, hoses and fittings with different pressure ratings shall be clearly marked and/or be physically different e.g. different diameters, hose markings, shall be incorporated

References

- ISO 4413 Hydraulic fluid power - General rules relating to systems, Second edition 1998-08-15
- ISO 19296 Mining - Mobile machines working underground - Machine Safety First edition 2018-11

Implement

Pre-delivery inspections are conducted to confirm the status and adequacy of hydraulic lines on mobile equipment.

Monitor

Detailed inspection check lists, with photographs of clamping arrangements required. Detailed parts lists are included as additional checks and as required are included in maintenance strategy / plant safety files(dossiers) documentation.

Field devices provide monitoring capacity to provide local and off-machine status data related to system health.

Where applicable, guarantees are provided from OEMs on the achievement of design/documented life of key components (such as lines carrying flammable liquids).