



Engine Dynamics & Structural Analysis

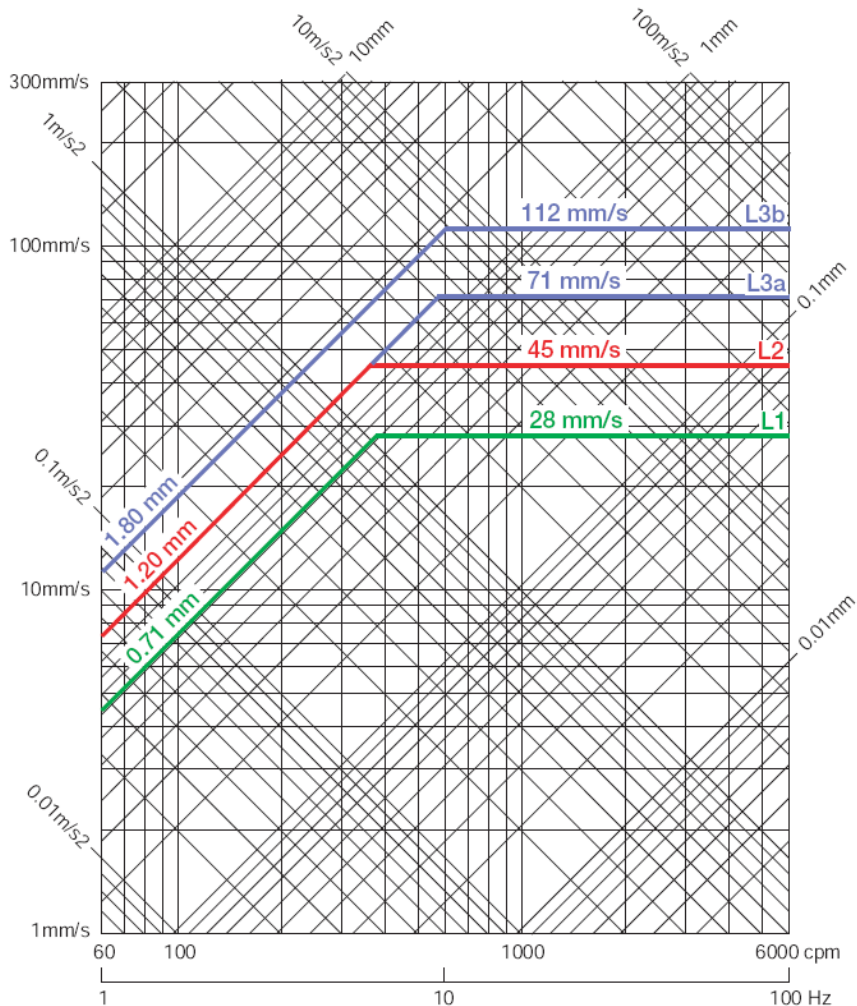
WinGD vibration limits & measuring points

Robert Glaeser, 20. December 2018

WIN GD
Simply a better different

WinGD vibration limits

Acceptable vibrations (RMS) for WinGD 2-stroke engines



L1

Engine block
 Charge air receiver
 E-motors
 Terminal boxes
 Engine fitted electronic-
 equipment

L2

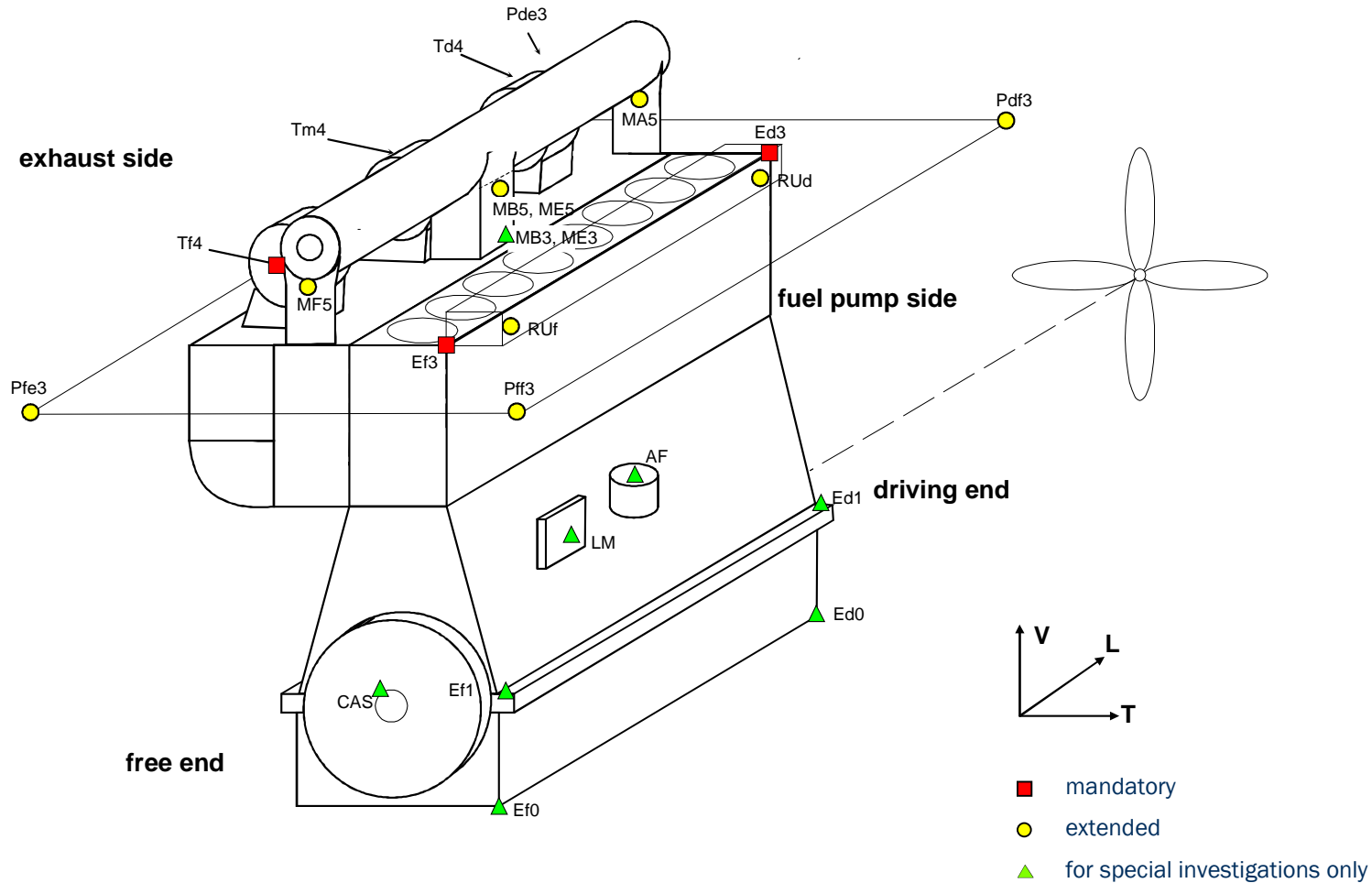
Platform beams
 Pipes at main support
 Common rail box
 Exhaust manifold supports

L3

High-pressure pipes
 a : Standard limit
 b : upon special considerations

WinGD vibration limits / measuring points

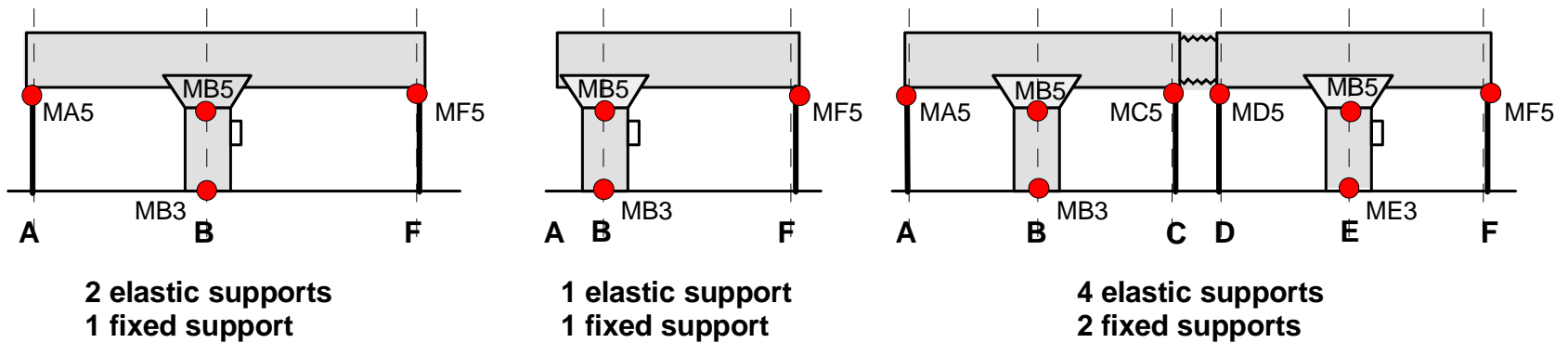
Standard measurement points



WinGD vibration limits / measuring points

Standard measurement points around manifold

Exhaust manifold arrangements depending on engine type and cylinder number



WinGD vibration limits / measuring points

Measurement point categories

Category 1

- Engine block (standard measurement points given in ISO 10816-6, § 4.2)
- Charge air receiver, charge air cooler
- Pressure gauge board, cylinder lubricator unit
- Automatic oil filter box (X- and RT-flex only)
- Terminal boxes, E motors
- Engine fitted electronic equipment

Category 2

- Platform beams
- Pipes (fuel, oil, water, air)
- Cylinder cooling water collector
- Common rail frame (X- and RT-flex only)
- Exhaust manifold top of supports

Category 3

- High pressure pipes (X- and RT-flex only)






WinGD vibration limits / measuring points

Standard measurement points on X-, RT-flex + RTA Engines




| Point | Priority | Description | Limit | Point | Priority | Description | Limit |
|-------|---------------------------------------|---|-------|--|---------------------------------------|--|-------|
| Ed3 | 1 ■ | Engine top, driving end | L1 | MA5 | 2 ● | Exhaust manifold, flexible support top, driving end | MA5 |
| Ef3 | 1 ■ | Engine top, free end | L1 | MB5 | 2 ● | Exhaust manifold, aft fixed support top | L2 |
| Ed1 | 3 ▲ | Engine bedplate top, driving end | L1 | MC5 | 3 ▲ | Exhaust manifold, aft flexible support top, mid engine | L2 |
| Ef1 | 3 ▲ | Engine bedplate top, free end | L1 | MD5 | 3 ▲ | Exhaust manifold, forward flexible support top, mid engine | L2 |
| Td4 | 1 ■ | Turbocharger rotor level, driving end | L* | ME5 | 2 ● | Exhaust manifold, forward fixed support top | L2 |
| Tm4 | 1 ■ | Turbocharger rotor level, mid engine | L* | MF5 | 2 ● | Exhaust manifold, flexible support top, free end | L2 |
| Tf4 | 1 ■ | Turbocharger rotor level, free end | L* | MB3 | 3 ▲ | Exhaust manifold aft fixed support, bottom | L2 |
| Pdf3 | 2 ● | Upper platform, driving end, fuel pump side | L2 | ME3 | 3 ▲ | Exhaust manifold forward fixed support, bottom | L2 |
| Pde3 | 2 ● | Upper platform, driving end, exhaust side | L2 | <i>Priority:</i> 1 mandatory ■ 2 extended ● 3 for special investigations only ▲ | | | |
| Pff3 | 2 ● | Upper platform, free end, fuel pump side | L2 | | | | |
| Pfe3 | 2 ● | Upper platform, free end, exhaust side | L2 | | | | |

WinGD vibration limits / measuring points

Additional standard measurement points on X- & RT-flex engines

| Point | Priority | Description | Limit |
|------------|---|-------------------------------------|-----------|
| RUd | 2  | Rail Unit box, driving end | L2 |
| RUf | 2  | Rail Unit box, free end | L2 |
| AF | 3  | Automatic Filter unit for servo oil | L1 |
| LM | 3  | Local Manoeuvring control box (E25) | L1 |
| CAS | 3  | Crank Angle Sensor unit | L1 |

Priority:

- 1 mandatory 
- 2 extended 
- 3 for special investigations only 

WinGD vibration limits / measuring points

Priority of measurement points and remarks

Priority

- 1 : standard measurement
- 2 : extended measurement
- 3 : for special investigations only

Limits

- L1 WinGD-limit category 1
- L2 WinGD-limit category 2
- L3 WinGD-limit category 3
- L* Limit according supplier

Measurement directions

- the measurements should be taken in all 3 directions, if applicable

Measurement range

- Some of above locations carry high-frequency structure-borne noise or shock waves from mechanical or hydraulic impacts that may generate excessive measurement values if not filtered off properly to approx. 100 Hz.

Thank you for your attention!

