



TechHydraulic Platform



Agenda

01 **problem**

02 **solution**

03 **case study**

04 **next steps**

05 **addendum**

Problem

**80% OF THE TRAM BRAKE OIL SYSTEM
IS NOT CLEANED AT ALL
AT THE DEPOT**

Problem

the problem
transport
company
is facing
while
servicing
brake system

The Brake System

- Incomplete brake oil flushing.
- Lack of methods for flushing brake unit and brake accumulator.
- There is no possibility to flush the brake unit and accumulator on the tram.
- Unstable cleaning results.

Depot Staff

- Insufficient autonomy. The Operator must be fully involved in the procedure.

Documentation

- The absence of the wireless data transmission and retention of test protocols.

Problem

the problem in numbers

Among the whole
system only

20%

of the brake system
is cleaned

The cost for brake
replacement is

€ 40k

per tram, which
could be avoided

The manual cleaning
process

x3

increase tram
downtime

current vs new vision

Current approach at Depot

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Diagnostics

- run by top-level system in context of whole vehicle
- the issue is determined in general
- disassemble of the unit is required to determine the problem

- run by TechHydraulic Platform, checking precisely each component
- the issue is determined accurately
- disassembling is not required, full diagnostics is carried out on site

Flushing

- circle

- **unit, accumulator, circle**
- **fully automated**

Depot Staff

- fully involved in the process

- human presence is not required

Documentation

- result protocols are collected on the device

- result protocols are stored to the cloud or send to email

Equipment

- heavy, hard to be transported

- with **electric drive**, self-propelled

Solution

TechHydraulic Platform

smart service for the whole hydraulic brake system

DBOX ONE



diagnosing
hydraulic **brake units**

HYDBOX



cleaning and filling
hydraulic **brake units and
accumulators**

HYDBOX ONE



cleaning and filling
**brake circuit,
brake unit and accumulator**

Solution

BENEFIT #1

a portable, lightweight device
that can be easily operated by
one person

DBox 22kg / HydBox 35kg



Solution

BENEFIT #2

performing full and accurate
diagnostics of brake unit in the
depot



Solution

BENEFIT #3

TOUCH SCREEN
DISPLAY WITH
USER FRIENDLY
DESIGN

SOUND/LED SIGNALING

WIFI / GSM

ELECTRICAL MOTORS



Solution

product summary

Technical #1

platform solution for
cleaning the entire brake
system

Smart Depot #2

portable and automotive
device to build smart depot
and sustainable ecosystem

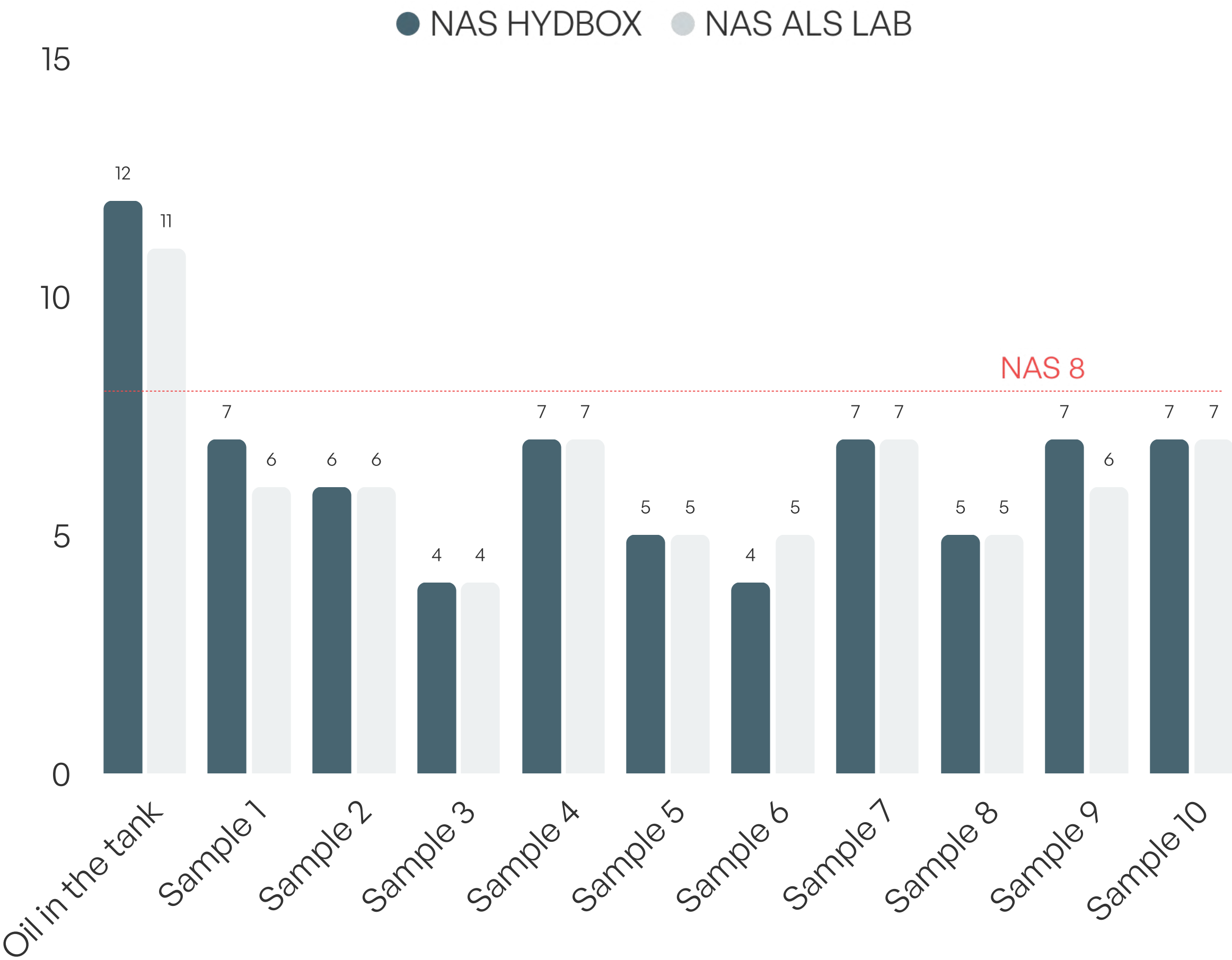
Efficiency #3

significantly reduces the
hours spent on maintenance
work and prolong the brake
system operational lifespan

case study

Oil purity test results
according to NAS 1638.

The data illustrates the oil quality following the use of our HYDBOX compared to the findings from ALS Laboratory.



what results we achieve?

TechHydraulic Platform tested and cleaned different types of brake systems in **Riga, Bratislava, Chemnitz, Konya, Miskolc.**

During diagnostics, the most common issues identified were **failures in proportional and safety valves, wear of motor brushes.**

140

brake units were tested and cleaned

20

trams were cleaned in depot

30+

samples were verified

100%

achieved NAS 8



Next Steps

ready to get started?

Experienced in engineering, mechanics, microprocessor control systems and IT systems development.

We are building sustainable future with smart service in smart depot.

We are glad to discuss the application of the TechHydraulic Platform at your transport depot. Please contact us so that we can discuss it in more detail.

Try Pitch



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Addendum

Parameter	Characteristics
Type	DBOX One TIS.100D V2
Size	410mm height x 220mm width
Level of dust protection	IP65
Operating temperature	-20°C to 50°C
Weight	22kg
Power/Voltage	220V
Max. default voltage	24V
Max. default current	40A
Number of Inputs	10
GSM / WiFi	Yes
Compatible with Smart Depot	Yes

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DBOX ONE



diagnosing
hydraulic brake units

Parameter	Characteristics
Type	HYDBox TIS.100H V2
Size	470mm height x 285mm width
Level of dust protection	IP65
Operating temperature	10°C to 50°C
Weight	35kg
Power/Voltage	24V
Accumulator / cleaning circuit system pressure	max 160bar / max 12bar
Oil purity level according to NAS 1638	NAS 8

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HYDBOX



cleaning and filling
hydraulic brake units and accumulators

Addendum

Parameter	Characteristics
Type	HYDBox ONE TIS.1000H V2
Size	858mm height x 1200mm length x 624mm width
Operating temperature	-10°C to 50°C
Weight	depends on the version, min 210kg
Voltage	380V
Accumulator / cleaning circuit system pressure	max 60bar / max 12 bar
Volumetric flow rate	depends on the version
Oil purity level according to NAS 1638	NAS 8
Pulsation	Yes
Signaling	Visual LED, sound, sms, email
GSM / WiFi / Cloud data transmission	Yes
Compatible with Smart Depot	Yes
Filling the circuit and aggregate	Yes
Flushing of aggregate	Yes, optionally
Autonomous driving	Yes, optionally
Remote control	Yes

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HYDBOX ONE



cleaning and filling
brake circuit,
brake unit and accumulator

THANK YOU



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