

Micro Control Systems

APPLICATION NOTE
APP-030

NAPPS ENG TRANSDUCER OPTIONS

Revision History

Date	Author	Description
7/11/01	J Walterick	Printed circuit board & transducer options for engines

Theory

Due to the difficulty to obtain 4 wire pressure transducers, this will outline the options to use three wire transducers. Also this will review the calibration procedure for the transducers.

Background

The 4 wire pressure transducers were originally less expensive because the regulation and amplification were done on the printed circuit board.

The 3 wire pressure transducers were more expensive because the regulation and amplification were done within the transducer.

As technology progressed the cost to do the regulation and amplification became less expensive and the industry has shifted, almost exclusive, to the 3 wire transducer.

MCS Controllers Versions used on NAPPS Engine

There are three (3) revisions of the MCS-8 microprocessor used on the Napps engines as follows: (The revision number can be found on a label on the large square chip just slightly to the left of the center of the printed circuit board.)

1. MCS-8 revision 1.2xx- This is the original revision used. It has eight sensor inputs on the bottom left portion of the board. The 4 left most are 4 wire inputs and can only support the 4 wire transducers. (or digital inputs)
2. MCS-8 revision 1.4xx- This revision has the same configuration of sensor inputs but can support both 4 wire & 3 wire transducers.
3. MCS-8 revision 1.5xx- This is the current revision level and only supports 3 wire pressure transducers.

Pressure transducer options

There are many transducers on the market. Listed below are the ones we have experience with installed on units.

1 Four Wire-

- | | |
|---------------------------|-------------------------------------|
| 1.1 Data Inst. Mediamate- | Can be purchased through Data Inst. |
| 1.2 Danfoss AKC31R- | We believe no longer produced. |
| 1.3 Micron Inst.- | Very high failure rate in field. |

- 2 Three wire-
 - 2.1 Data Inst. Eclipse- Good unit. No longer manufactured.
 - 2.2 Danfoss AKC32R- Expensive (About \$500)
 - 1.3 MCS TI-500-20- One of the most reliable & cost \$145

Option's

When you have a transducer failure you here a several options as follows:

- 1 Revision 1.2xx-
 - 1.1 Through Data Inst. buy the Mediamate
 - 1.2 Upgrade to a 1.4xx revision where you can mix transducers.
 - 1.3 Upgrade to a 1.5xx revision and replace transducers with MCS TI-500-20.
(Use mediamate's that are good as spares on other machines, if you have any.)
- 2 Revision 1.4xx-
 - 2.1 Replace bad transducers with MCS TI-500-20.

Estimated

- 1 Revision 1.2xx transducer replacement
 - Data Inst Mediamate (estimate) Cost \$unknown
 - Danfoss AKC31R (estimate) Cost \$unknown
- 2 Revision 1.2xx upgrade to revision 1.5xx
 - MCS-8 revision printed circuit board Cost \$800 each
 - MCS TI-500-20 pressure transducer Cost \$145 each

Transducer Calibration

With engine off, gages connected to suction & discharge lines on compressor and under the 'SERVICE DIAGNOSTIC' key use sensor offset option, do the following:

- 1. Put in the offset necessary to zero the engine oil transducer.
- 2. Put in the offset necessary to calibrate the suction to the gage.
- 3. Put in the offset necessary to calibrate the discharge to the gage.
- 4. Put in the offset necessary to calibrate the compressor oil to the suction.

If you need an offset larger than ± 15 psi you should replace the transducer.