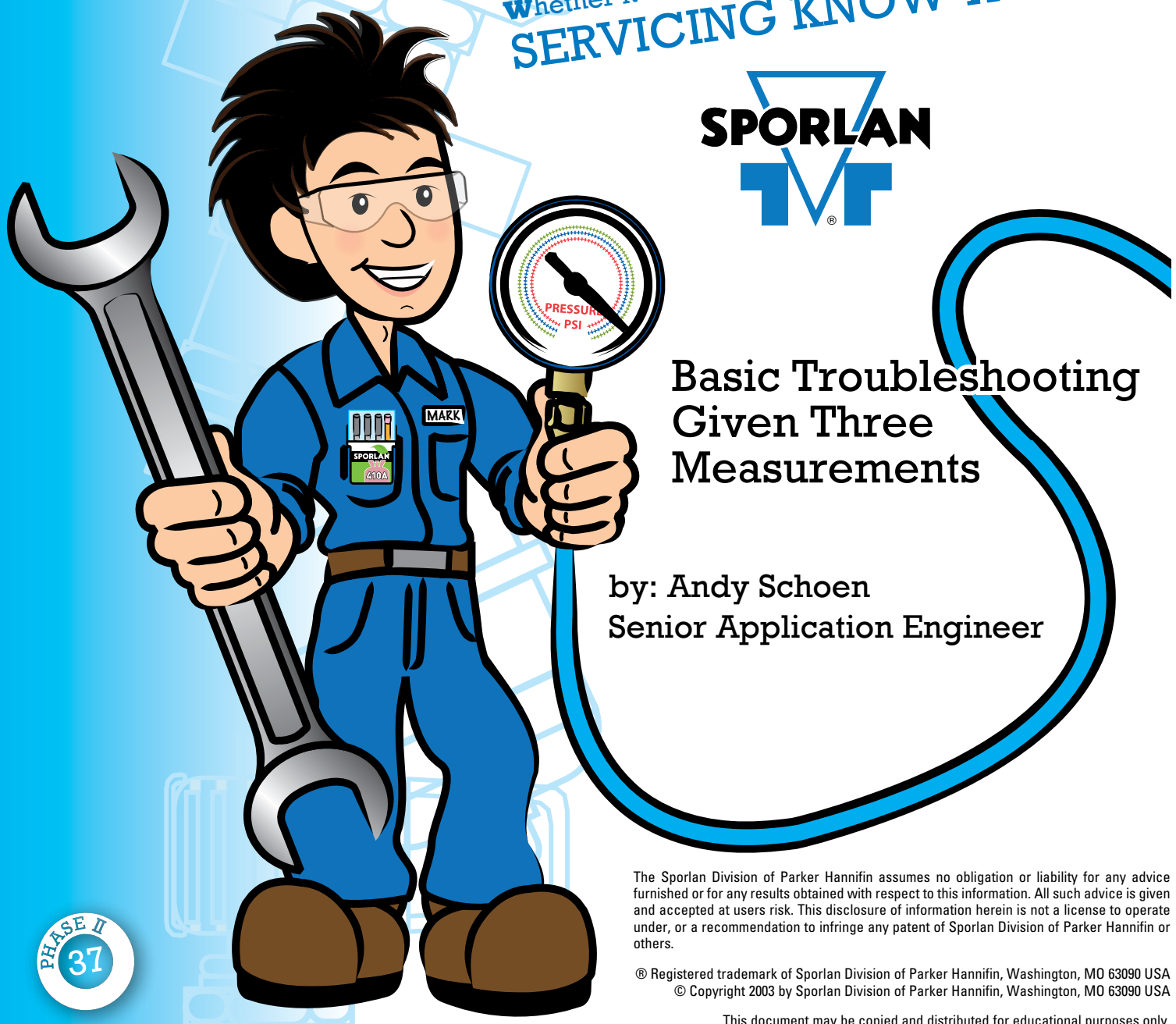
A collection of short pointed topical papers.

June 2009

# Cold W·A·R·

Whether it's Air Conditioning or Refrigeration
SERVICING KNOW-HOW

SPORLAN




## Basic Troubleshooting Given Three Measurements

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PHASE II
37



Cold W.A.R. Phase II, Issue 37

# Basic Troubleshooting Given Three Measurements

If we take the following 3 measurements: discharge pressure, suction pressure, and superheat at the evaporator coil outlet, and we make the determination that each of these measurements can only have 3 possible outcomes: higher than normal, normal, or lower than normal, we end up with 27 possible combinations.

Can you identify the likely problem for each of these combinations? Note that one of these combinations is the system is operating properly.

To simplify this analysis, we will assume the system components, compressor, evaporator, condenser, and expansion device, are properly sized and the equipment sized correctly for the original load. For each of these combinations, you may assume the expansion device to be either a TEV or fixed restrictor, whichever you believe better explains the problem.

To help you along, a few of the simpler combinations have been filled in for you. Also, you may find it helpful to reference the Ups and Downs of Servicing, March 2006, Cold W.A.R. which is available on our site: sporlan.jandrews-choen.com

| Scenario | Suction | Discharge | Superheat | Problem |
|---|---|---|---|---|
| 1. | ↓ | ↓ | ↓ | low load, insufficient airflow |
| 2. | ↓ | ↓ | ↔ | low load, insufficient airflow, TEV control ok |
| 3. | ↓ | ↓ | ↑ | refrigerant undercharge, restriction |
| 4. | ↓ | ↔ | ↓ | |
| 5. | ↓ | ↔ | ↔ | |
| 6. | ↓ | ↔ | ↑ | |
| 7. | ↓ | ↑ | ↓ | |
| 8. | ↓ | ↑ | ↔ | |
| 9. | ↓ | ↑ | ↑ | |
| 10. | ↔ | ↓ | ↓ | |
| 11. | ↔ | ↓ | ↔ | |
| 12. | ↔ | ↓ | ↑ | |
| 13. | ↔ | ↔ | ↓ | |
| 14. | ↔ | ↔ | ↔ | system operating properly |
| 15. | ↔ | ↔ | ↑ | |
| 16. | ↔ | ↑ | ↓ | |
| 17. | ↔ | ↑ | ↔ | |
| 18. | ↔ | ↑ | ↑ | |
| 19. | ↑ | ↓ | ↓ | |
| 20. | ↑ | ↓ | ↔ | |
| 21. | ↑ | ↓ | ↑ | bad/inefficient compressor |
| 22. | ↑ | ↔ | ↓ | |
| 23. | ↑ | ↔ | ↔ | |
| 24. | ↑ | ↔ | ↑ | |
| 25. | ↑ | ↑ | ↓ | refrigerant overcharge |
| 26. | ↑ | ↑ | ↔ | |
| 27. | ↑ | ↑ | ↑ | |

↑ = above normal
↔ = normal
↓ = below normal