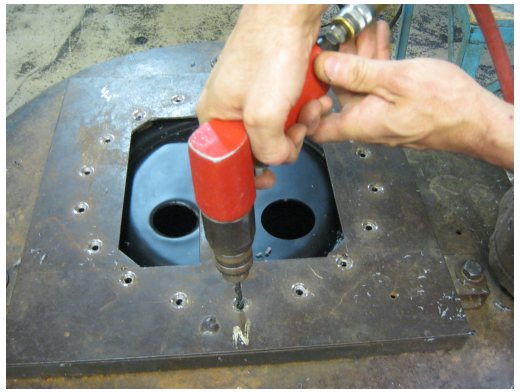
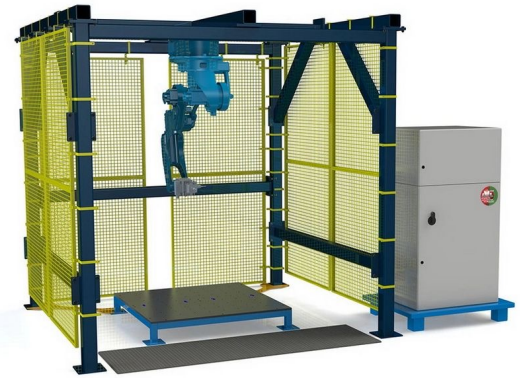
An Automation Journey

(FROM HAND FIXTURES TO CNCs TO ROBOTS AND BACK AGAIN)



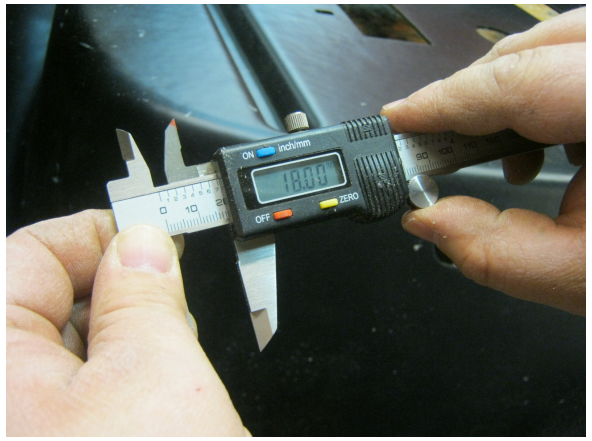


Kenneth Bather
V.P. Plastics
Seljan Company Inc.

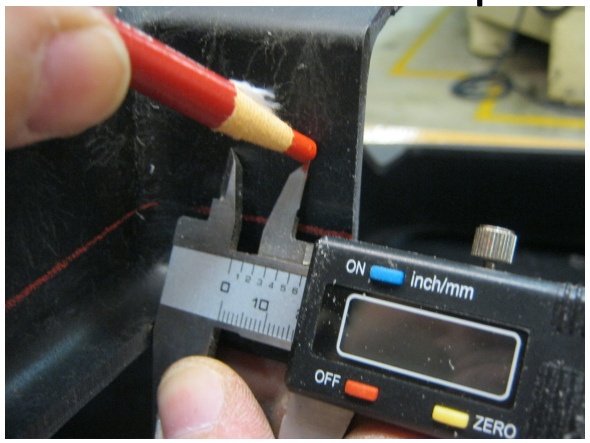
SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

Original or Prototype Parts (Often Production as well)

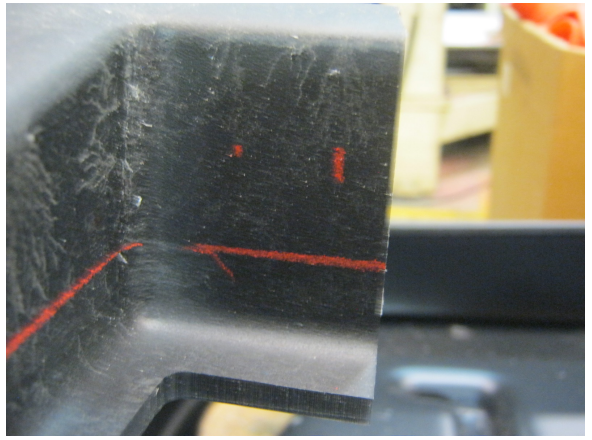
Precision Work



Measure with Calipers



Mark with…

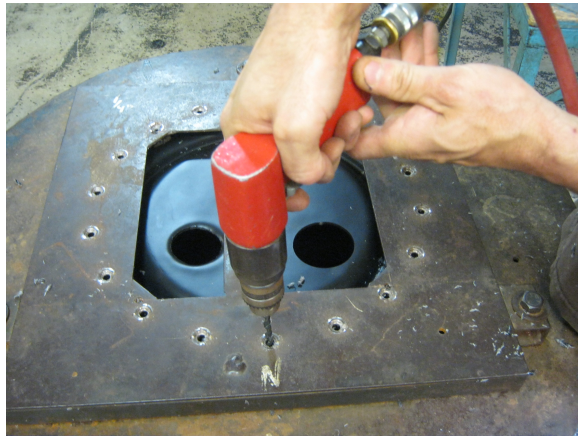


Cut with a Saw

SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

Reference Fixtures or Guides (Oh so many jobs)

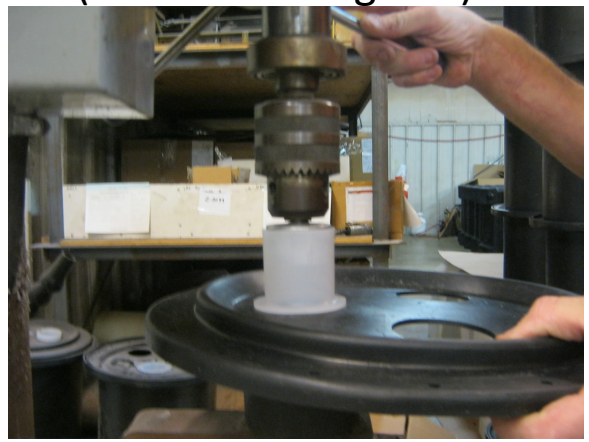
Drill Fixture
(No Bushings)



Drill-Point

Bandsaw Fixture

Spin Weld Fixture
(Drill Press Stage #1)



Drill Fixture
(With Bushings)

Router Fixture

Bandsaw Fixture
(Two Person Operation)

Part as Fixture

SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

CNC Routers (Computer Numerical Control)

Typical Older Machine

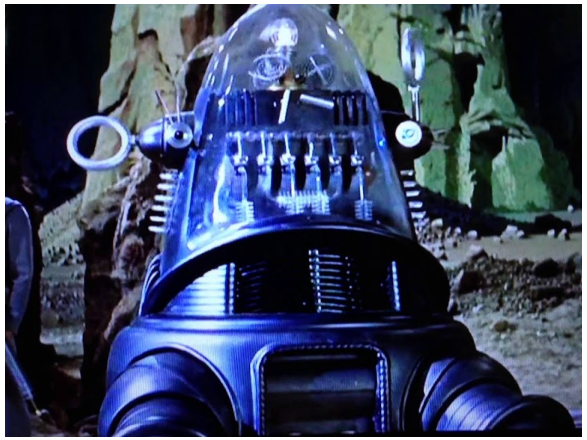
The Upgrade
(Tool Changer)

Modern Equipment
(Enclosed Operation)

SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

INDUSTRIAL ROBOTS (Well actually Routing Robots + ?)

Robby
(Forbidden Planet)



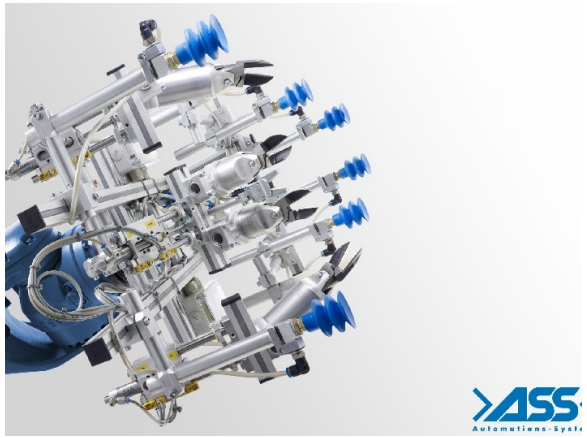
Our Robots
(The Basic Building Block)

What is the difference?
(The Robot "Tool Changer?")

(Robot: Czech, from Robota: referring to Forced Labor or Drudgery)

EOAT (End of Arm Tooling)

The End of The Arm
(… oh the Possibilities)



Flame Polishing
(Done That)

Spin Weld
(Doing That)

So What Next?

SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

...and in the end (An Opinion – and to quote Mrs. Slocombe"...and I am unanimous in that")

What Have We Really Accomplished As An Industry With This "Automation"

- Cut Parts
- Save Money
- Something That Never Tires
- Replace People

Looking Back... A Birmingham Screwdriver

(a.k.a. Maslow's Hammer or Kaplans Law)

Transfer Rotational Injection Process a.k.a. TRIP molds (2001)

Snap-Serts

Teflon Coating

Transvectors

The Same Two Issues Exist, for now...

Dimensional Stability

Physical Access

Solution(s)

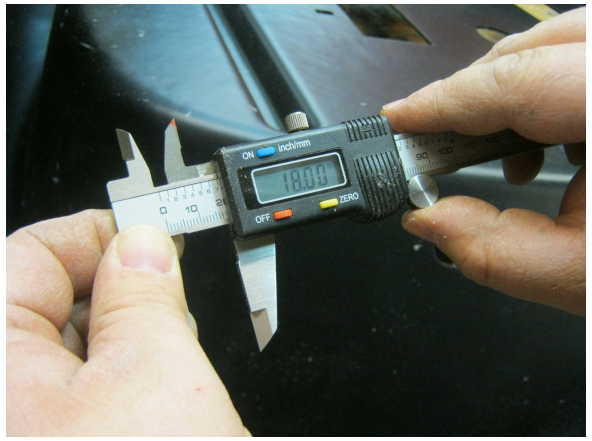
INTEGRATION

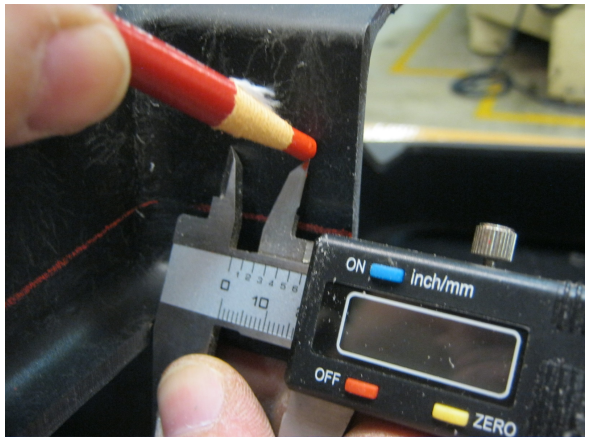
SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

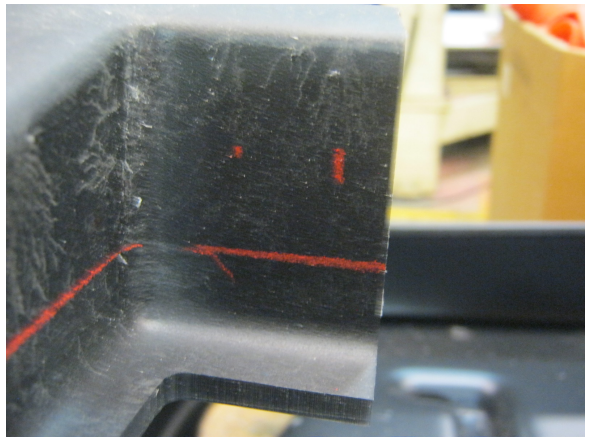
EXAMPLE 01

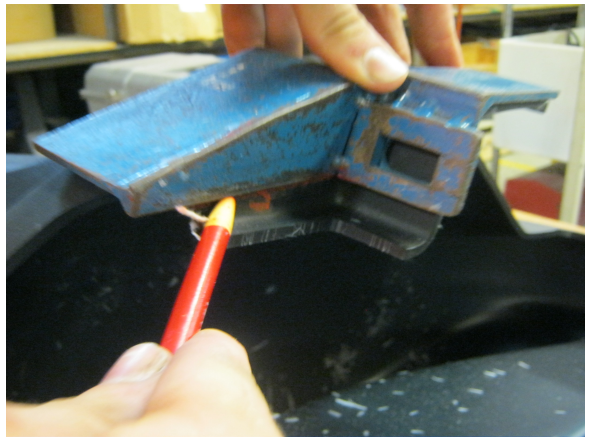
SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

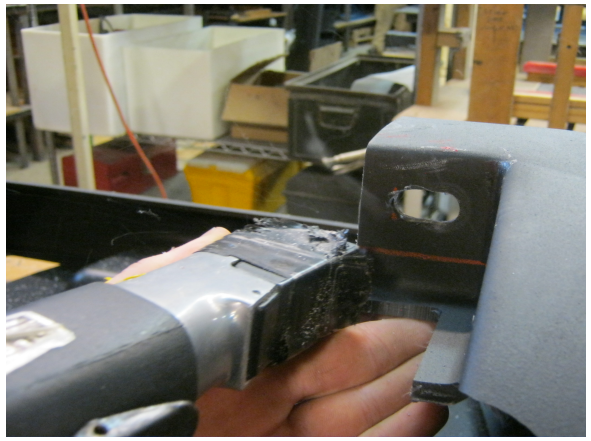
EXAMPLE 02





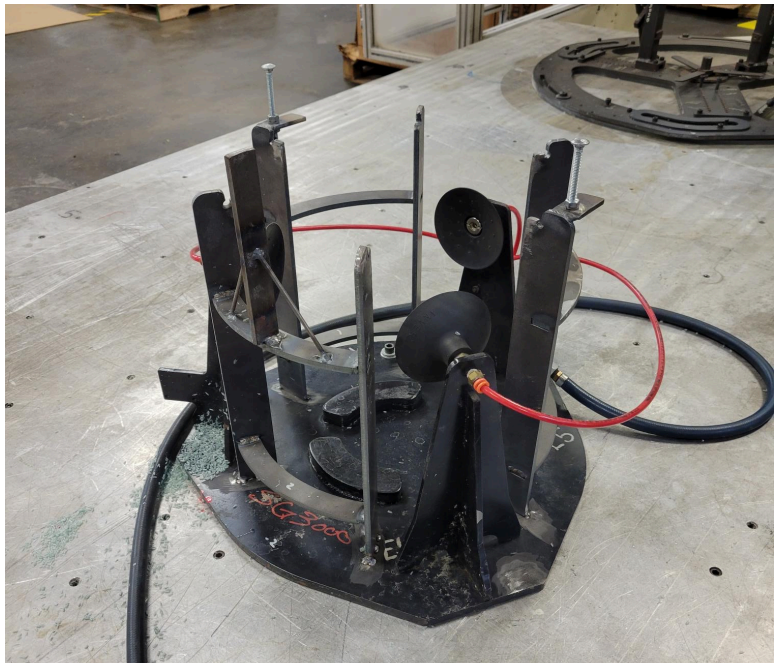






SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box

EXAMPLE 03

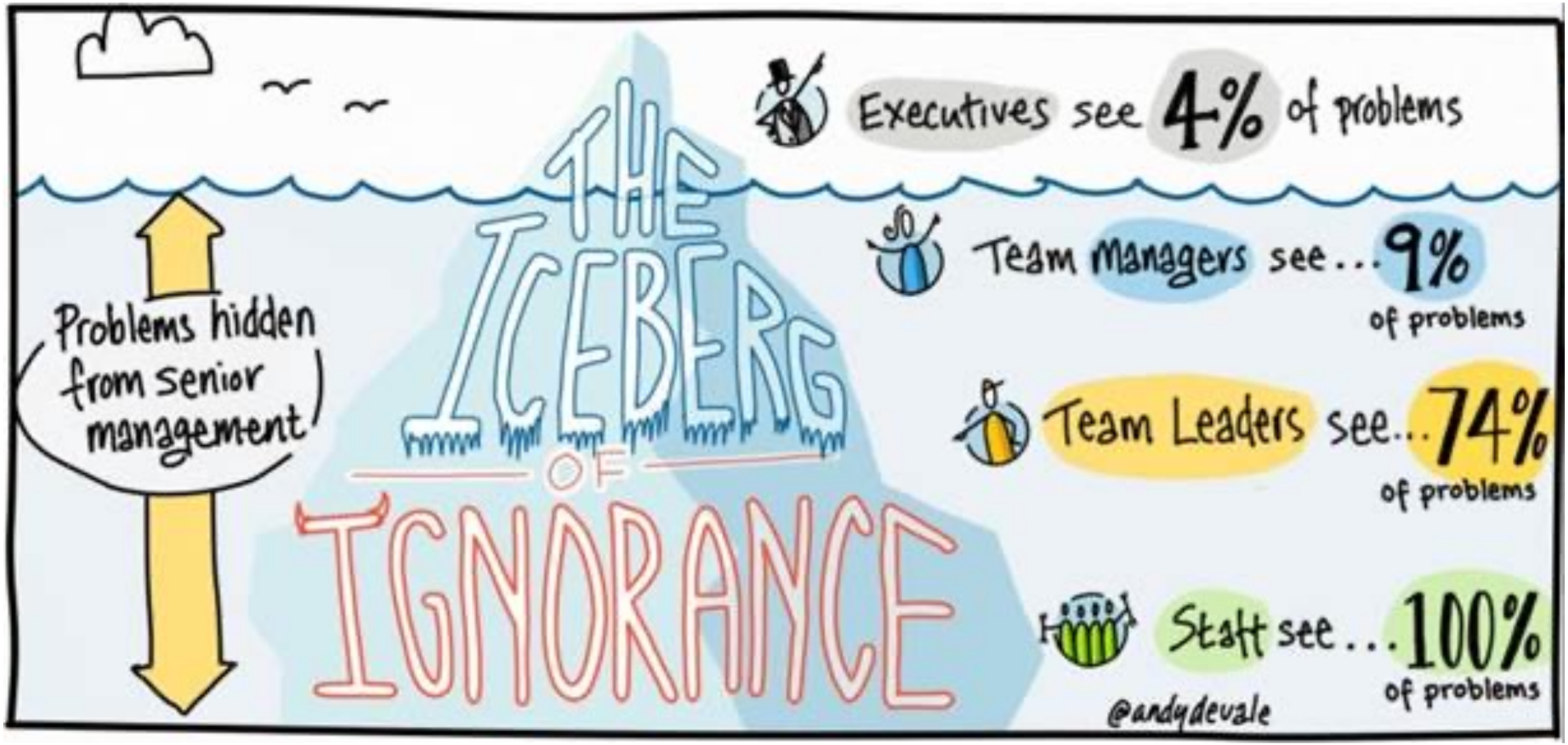


When considering observations made by others remember the

The Iceberg of Ignorance

&

… Be Understanding



SELJAN
PLASTIC & METAL MANUFACTURING
Thinking outside the box