HOBART FILLER METALS

Causes and Cures of Common Welding Troubles

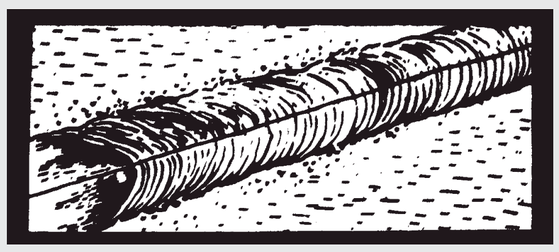
Porous Welds

Why

1. Excessively long or short arc length
2. Welding current too high
3. Too fast travel speed
4. Base metal surface covered with oil, grease, moisture, rust, mill scale, etc.
5. Wet, unclean or damaged electrode

What to Do

1. Maintain proper arc length
2. Use proper welding current
3. Reduce travel speed
4. Properly clean base metal prior to welding
5. Properly maintain and store electrode



Cracked Welds

Why

1. Insufficient weld size
2. Excessive joint restraint
3. Poor joint design and/or preparation
4. Filler metal does not match base metal
5. Rapid cooling rate
6. Base metal surface covered with oil, grease, moisture, rust, dirt or mill scales

What to Do

1. Adjust weld size to part thickness
2. Reduce joint restraint through proper design
3. Select the proper joint design
4. Use more ductile filler
5. Reduce cooling rate through preheat
6. Properly clean base metal prior to welding

Undercutting

Why

1. Faulty electrode manipulation
2. Welding current too high
3. Too fast travel speed
4. Arc blow

What to Do

1. Pause at each side of the weld bead when using a weaving technique
2. Use proper electrode angles
3. Use proper welding current for electrode size and welding position
4. Reduce travel speed
5. Reduce effects of arc blow

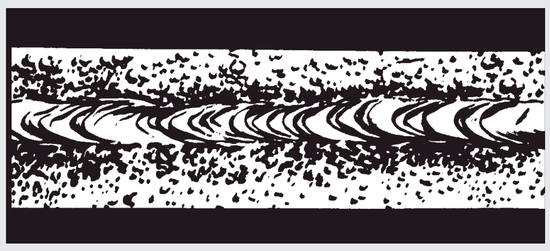
Distortion

Why

1. Improper tack welding and/or faulty joint preparation
2. Improper bead sequence
3. Improper set-up and fixturing
4. Excessive weld size

What to Do

1. Tack weld parts with allowance for distortion
2. Use proper bead sequencing
3. Tack or clamp parts securely
4. Make welds to specified size



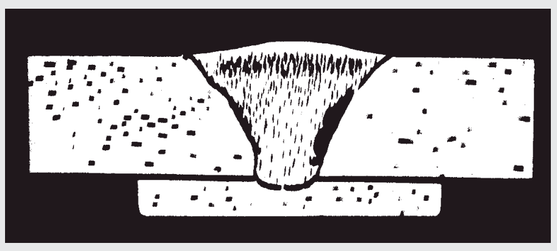
Spatter

Why

1. Arc blow
2. Welding current too high
3. Too long an arc length
4. Wet, unclean or damaged electrode
5. Unclean welding surface

What to Do

1. Attempt to reduce the effect of arc blow
2. Reduce working current
3. Reduce arc length
4. Properly maintain and store electrodes
5. Clean welding surface



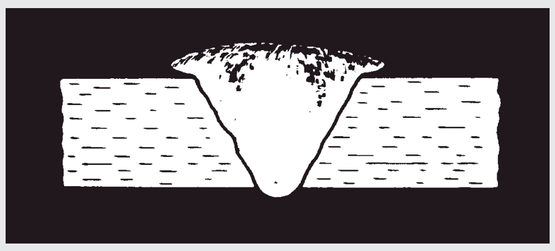
Lack of Fusion

Why

1. Improper travel speed
2. Welding current too low
3. Faulty joint preparation
4. Too large an electrode diameter
5. Magnetic arc blow
6. Wrong electrode angle

What to Do

1. Reduce travel speed
2. Increase welding current
3. Weld design should allow electrode accessibility to all surfaces within the joint
4. Reduce electrode diameter
5. Reduce effects of magnetic arc blow
6. Use proper electrode angles



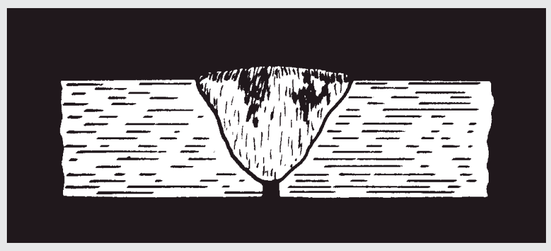
Overlapping

Why

1. Too slow travel speed
2. Incorrect electrode angle
3. Too large an electrode

What to Do

1. Increase travel speed
2. Use proper electrode angles
3. Use a smaller electrode size



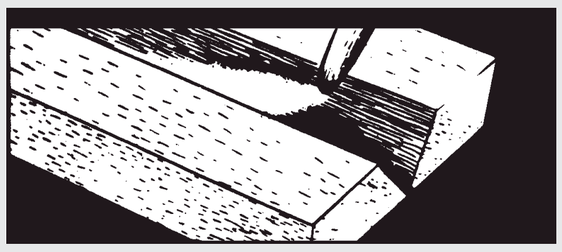
Poor Penetration

Why

1. Travel speed too fast
2. Welding current too low
3. Poor joint design and/or preparation
4. Electrode diameter too large
5. Wrong type of electrode
6. Excessively long arc length

What to Do

1. Decrease travel speed
2. Increase welding current
3. Increase root opening or decrease root face
4. Use smaller electrode
5. Use electrode with deeper penetration characteristics
6. Reduce arc length



Magnetic Arc Blow

Why

1. Unbalanced magnetic field during welding
2. Excessive magnetism in parts or fixture

What to Do

1. Change the location of the ground connection on the workpiece
2. Reduce welding current and arc length
3. Use alternating current

Inclusions

Why

1. Incomplete slag removal between passes
2. Erratic travel speed
3. Too wide a weaving motion
4. Too large an electrode
5. Letting slag run ahead of arc

What to Do

1. Completely remove slag between passes
2. Use a uniform travel speed
3. Reduce width of weaving technique
4. Use a smaller electrode size for better access to joint
5. Increase travel speed or change electrode angle or reduce arc length