**Objective**

<table>
<thead>
<tr>
<th>TASK</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify and interpret welding symbols on a provided drawing.</td>
<td></td>
</tr>
</tbody>
</table>
**Performance Profile Sheet**

**Craft:** Welding  
**Module Number:** 29202-09  
**Module Title:** Reading Welding Detail Drawings

**Trainee Name:** _____________________________________________________________

**Trainee Social Security Number:** _________________________________________

**Class:** __________________________________________________________________

**Training Program Sponsor:** _______________________________________________

**Instructor:** _______________________________________________________________

---

**Rating Levels:**  
(1) Passed: performed task  
(2) Failed: did not perform task  
Also, list the date the testing for each task was completed.

**Recognition:**  
When testing for the NCCER Standardized Craft Training Program,  
be sure to record Performance testing results on Craft Training Report  
Form 200, and submit the results to the Training Program Sponsor.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Task</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1. Draw or sketch a welding drawing based on a given image or drawing.</td>
<td></td>
</tr>
</tbody>
</table>
Module 29203-09 has no Performance Profile Sheet; no performance testing is required for this module.
### Objective TASK RATING

<table>
<thead>
<tr>
<th>Objective</th>
<th>TASK</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1. Preheat base metal to 350°F and verify preheat using a temperature-indicating device.</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>TASK</td>
<td>RATING</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>5</td>
<td>1. Set up GMAW and FCAW equipment with appropriate shielding gases and filler metals.</td>
<td></td>
</tr>
</tbody>
</table>
TRAINER NAME: _____________________________________________________________

TRAINEE SOCIAL SECURITY NUMBER: _________________________________________

CLASS: ____________________________________________________________________

TRAINING PROGRAM SPONSOR: _____________________________________________

__________________________________________________

INSTRUCTOR: _______________________________________________________________

Rating Levels: (1) Passed: performed task  (2) Failed: did not perform task
Also, list the date the testing for each task was completed.

Recognition: When testing for the NCCER Standardized Craft Training Program, be sure to record Performance testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

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<tr>
<th>Objective</th>
<th>TASK</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1. Make multiple-pass GMAW-S (short-circuit) fillet welds on carbon steel plate coupons in the following positions, using solid or composite wire:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4F</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Objective</th>
<th>TASK</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2. Make multiple-pass FCAW-G/GM (gas-shielded) or FCAW-S (self-shielded) fillet welds on carbon steel plate coupons in the following positions:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4F</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3. Make multiple-pass FCAW-G/GM (gas-shielded) or FCAW-S (self-shielded) V-groove welds on carbon steel plate coupons in the following positions (with or without backing):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4G</td>
<td></td>
</tr>
</tbody>
</table>

continued
<table>
<thead>
<tr>
<th>Objective</th>
<th>TASK</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4. Make multiple-pass GMAW-S (short-circuit) V-groove welds on carbon steel plate coupons in the following positions (with or without backing), using solid or composite wire:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4G</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5. Make multiple-pass GMAW spray fillet welds on carbon steel plate coupons in the following positions, using solid or composite wire:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2F</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6. Make multiple-pass GMAW spray V-groove welds on carbon steel plate coupons in the 1G position (with or without backing), using solid or composite wire.</td>
<td></td>
</tr>
</tbody>
</table>
MAKE A FILLET WELD IN THE (1F) FLAT POSITION

As directed by the instructor, use GMAW (spray and/or short-circuiting transfer), FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld size ±1/16"  
- Smooth flat transition with complete fusion at the toes of the welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No excessive undercut
- No overlap
- No inclusions
As directed by the instructor, use GMAW (spray and/or short-circuiting transfer), FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

**Criteria for Acceptance**

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld size ±\(1/16\)"
- Smooth flat transition with complete fusion at the toes of the welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No excessive undercut
- No overlap
- No inclusions
MAKE A FILLET WELD IN THE (3F) VERTICAL POSITION

As directed by the instructor, use GMAW, FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a vertical fillet weld on carbon steel plate, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{6}\)"
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE A FILLET WELD IN THE (4F) OVERHEAD POSITION

As directed by the instructor, use GMAW, FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ± 1/6"
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (1G) FLAT POSITION

As directed by the instructor, use GMAW (spray and/or short-circuiting transfer), FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a multiple-pass groove weld using stringer beads on carbon steel plate, with or without backing, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/16"
- Acceptable weld profile in accordance with the applicable code or standard
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8", if applicable
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (2G) HORIZONTAL POSITION

As directed by the instructor, use GMAW, FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without backing, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±¼"
- Acceptable weld profile in accordance with the applicable code or standard
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of ¼", if applicable
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (3G) VERTICAL POSITION

As directed by the instructor, use GMAW, FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without backing, as shown.

Note: Run the root vertical up or vertical down as specified by your instructor.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±1/16"
- Acceptable weld profile in accordance with the applicable code or standard
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/16", if applicable
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE A GROOVE WELD, WITH OR WITHOUT BACKING, IN THE (4G) OVERHEAD POSITION

As directed by the instructor, use GMAW, FCAW, or both processes with carbon steel solid or flux-cored electrode wire sizes, and, if required, appropriate shielding gas to make a multiple-pass groove weld on carbon steel plate, with or without backing, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{16}\)"
- Acceptable weld profile in accordance with the applicable code or standard
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of \(\frac{1}{8}\)", if applicable
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
**Objective** | **TASK** | **RATING**
--- | --- | ---
4 | 1. Select shielding gas for a given application. |  
3 | 2. Select filler metal for a given application. |  
4, 5 | 3. Connect the shielding gas and set the flow rate. |  
5 | 4. Select and prepare the electrode. |  
2, 5 | 5. Break down and reassemble a GTAW torch. |  

When testing for the NCCER Standardized Craft Training Program, be sure to record Performance testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.
### Objective 1

1. Build a pad with stringer beads on carbon steel plate coupons in the flat (1G) position using GTAW equipment and carbon steel filler metal.

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<tr>
<td>1</td>
<td>1. Build a pad with stringer beads on carbon steel plate coupons in the flat (1G) position using GTAW equipment and carbon steel filler metal.</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>Objective</th>
<th>TASK</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2. Perform multiple-pass fillet welds on carbon steel plate coupons in the following positions, using GTAW equipment and carbon steel filler metal:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4F</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3. Perform multiple-pass V-groove welds on carbon steel plate in the following positions, using GTAW equipment and carbon steel filler metal:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 3G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 4G</td>
<td></td>
</tr>
</tbody>
</table>
As directed by the instructor, use GTAW process with carbon steel filler metal to build a pad on a carbon steel coupon in the flat position.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{32}\)" 
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
As directed by the instructor, use GTAW process with carbon steel filler metal to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld size ±\(\frac{1}{16}\)"
- Smooth flat transition with complete fusion at the toes of the welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No excessive undercut
- No overlap
- No inclusions
- No cracks
As directed by the instructor, use GTAW process with carbon steel solid filler metal to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

**Criteria for Acceptance**

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld size ±\(\frac{1}{16}\)" 
- Smooth flat transition with complete fusion at the toes of the welds
- Acceptable weld profile in accordance with the applicable code or standard
- No porosity
- No excessive undercut
- No overlap
- No inclusions
- No cracks
MAKE MULTIPLE-PASS FILLET WELDS ON CARBON STEEL PLATE IN THE (3F) VERTICAL POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make a vertical fillet weld on carbon steel plate, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width ±\(\frac{1}{16}\)" 
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE MULTIPLE-PASS FILLET WELDS ON CARBON STEEL PLATE IN THE (4F) OVERHEAD POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make a six-pass fillet weld using stringer beads on carbon steel plate, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld width $\pm \frac{1}{16}$"  
- Acceptable weld profile in accordance with the applicable code or standard
- Smooth flat transition with complete fusion at the toes of the weld
- No porosity
- No excessive undercut
- No inclusions
- No cracks
MAKE MULTIPLE-PASS V-GROOVE WELDS ON CARBON STEEL PLATE IN THE FLAT (1G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple-pass V-groove welds on carbon steel plate in the flat (1G) position, as shown.

Criteria for Acceptance

• Uniform rippled appearance on the bead face ____________
• Craters and restarts filled to the full cross section of the weld ____________
• Uniform weld size ± 1/16" ____________
• Acceptable weld profile in accordance with the ASME Boiler and Pressure Vessel Code ____________
• Smooth transition with complete fusion at the toes of the weld ____________
• Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8" ____________
• No porosity ____________
• No overlap ____________
• No excessive undercut ____________
• No inclusions ____________
• No cracks ____________
• No pinholes (fish eyes) ____________
As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple-pass V-groove welds on carbon steel plate in the horizontal (2G) position, as shown.

**Criteria for Acceptance**

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld size ±1/16”
- Acceptable weld profile in accordance with the *ASME Boiler and Pressure Vessel Code*
- Smooth transition with complete fusion at the toes of the weld
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8”
- No porosity
- No overlap
- No excessive undercut
- No inclusions
- No cracks
- No pinholes (fish eyes)
MAKE MULTIPLE-PASS V-GROOVE WELDS ON CARBON STEEL PLATE IN THE VERTICAL (3G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple-pass V-groove welds on carbon steel plate in the vertical (3G) position, as shown.

Criteria for Acceptance

- Uniform rippled appearance on the bead face
- Craters and restarts filled to the full cross section of the weld
- Uniform weld size ±1/16"
- Acceptable weld profile in accordance with the ASME Boiler and Pressure Vessel Code
- Smooth transition with complete fusion at the toes of the weld
- Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8"
- No porosity
- No overlap
- No excessive undercut
- No inclusions
- No cracks
- No pinholes (fisheyes)
Performance Accreditation Tasks  
Module 29208-09

MAKE MULTIPLE-PASS V-GROOVE WELDS ON CARBON STEEL PLATE IN THE OVERHEAD (4G) POSITION

As directed by the instructor, use GTAW process with carbon steel filler metal to make multiple-pass V-groove welds on carbon steel plate in the overhead (4G) position, as shown.

NOTE: BASE METAL, CARBON STEEL PLATE AT LEAST 1/4” THICK

Criteria for Acceptance
• Uniform rippled appearance on the bead face ____________
• Craters and restarts filled to the full cross section of the weld ____________
• Uniform weld size ± 1/16” ____________
• Acceptable weld profile in accordance with the ASME Boiler and Pressure Vessel Code ____________
• Smooth transition with complete fusion at the toes of the weld ____________
• Complete uniform root reinforcement at least flush with the base metal to a maximum buildup of 1/8” ____________
• No porosity ____________
• No overlap ____________
• No excessive undercut ____________
• No inclusions ____________
• No cracks ____________
• No pinholes (fish eyes) ____________