



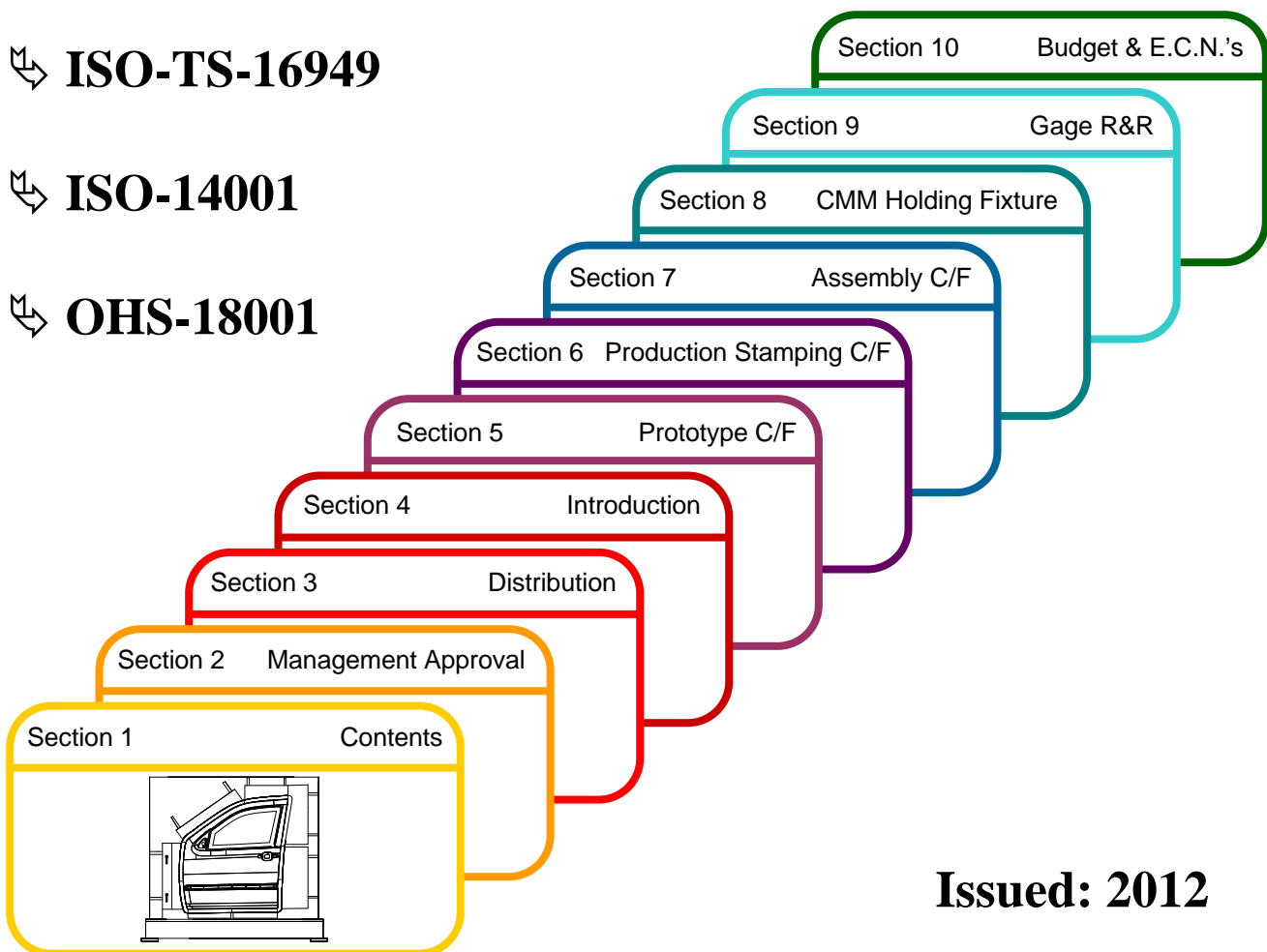
Ogihara America Corporation

Checking Fixture / Gage Build Specifications

↪ **ISO-TS-16949**

↪ **ISO-14001**

↪ **OHS-18001**



Issued: 2012

DOM-QE.10 Rev. 1

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Ogihara America Corporation

Checking Fixture Engineering Technical Standard



Issued By:

Director of Manufacturing
John Ruhman

Date _____

Quality Manager
Brett Smith

Date _____

Quality Tooling Engineer
Brent Jacques

Date _____

Checking Fixture Specifications

Distribution

Original	Ogihara Quality Department
Copy # 1	Ogihara Purchasing Department
Copy # 2	OAC Purchasing Department
Copy # 3	OAC Die Maintenance Department
Copy # 4	Ogihara Japan Main Office
Copy # 5	Ogihara Japan East Plant Q.C. Department
Copy # 6	Ogihara Prototype Supplier
Copy # 7	Ogihara Prototype Supplier
Copy # 8	Ogihara Prototype Supplier
Copy # 9	Ogihara Prototype Supplier
Copy # 10	Ogihara Prototype Supplier
Copy # 11	Ogihara Current Fixture Supplier
Copy # 12	Ogihara Current Fixture Supplier
Copy # 13	Ogihara Current Fixture Supplier
Copy # 14	Ogihara Current Fixture Supplier
Copy #15	Ogihara Current Fixture Supplier
Copy #16	Ogihara Current Fixture Supplier

Ogihara America Corporation is dedicated to meet or exceed all of our customer requirements. This commitment to customer covers all areas of our manufacturing processes. This checking fixture specification book covers all of OAC's checking fixture requirements. Specific requirements for gage manufacturing will be referenced from OAC's customer specifications. It is the checking fixture manufacturer's responsibility to fully understand all of the customer requirements for each checking fixture. The assembly checking fixture manufacturer must understand the customers locating systems, measuring systems, and gage design requirements. It is our responsibility as a team to provide our customer with the best quality checking fixtures available.

If there are any procedures that require updating due to technical advancements or other reasons, the Quality Systems Engineers identified below will distribute the information to the Ogihara America Corporation purchasing Department. Ogihara America purchasing department will notify all fixture suppliers of the updates.

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QUALITY MANAGER

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BRENT JACQUES

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CHECKING FIXTURE SPECIFICATIONS

PROTOTYPE CHECKING FIXTURES

- 1.0 RFS locating pins are not permissible under any condition. MMC pins only.
- 2.0 Stamp actual start dimensions in three planes and identify with "mm" symbol.
- 3.0 Stamp or identify the amount of feeler clearance between part and checking surface, (to be visible when part is in fixture) and identify with "mm" symbol.
- 4.0 Stamp or identify surfaces used for flush checking with the word "Flush".
- 5.0 Stamp the following information on identification plate: Fixture number, Part number, Part number that the fixture also checks, Actual weight, Part name, Engineering level, Construction source, and Inspectors identification.
- 6.0 Break all sharp corners.
- 7.0 Construction balls remain with fixtures and be covered with protective caps.
- 8.0 Set-up lines and line block location must be identified.
- 9.0 Clamps, Hinges, Flippers, Plugs, and Slides must be in working condition and free of play. This applies to commercial and non-commercial details.
- 10.0 Deviations from tool drawing must be in writing and approved by plant manufacturing engineering and checking fixture design section (staff).
- 11.0 Use dowels and socket head cap screws unless otherwise shown.
- 12.0 All fixture hardware and fasteners must be Metric standard.
- 13.0 Interchangeable details are to be mounted on fixture unless shown otherwise. Non-Mounted units must be shipped in same crate as fixture.
- 14.0 All Non-gaging surfaces are to be painted with specified enamel and metal checking surfaces must be black oxide. Observe all color code specifications identified at line up and according to this standard manual.

15.0 Checking fixture color specifications:

Rest Area	Bright yellow
Master Control Surface	Bright orange
Detail Panel C/F inspection surf.	Gray, with black sight check features
Steel assembly checking fixtures	The same color as the project dies and assembly equipment

16.0 It is the supplier's responsibility to understand all customer locating drawings. Example: Ford Ideas, Metaphase system.

17.0 All gages will be designed with the clamps and nets independent of the checking fixture form rail.

18.0 All checking fixtures will have the identification plate mounted in an accessible area while the panel is in the gage.

19.0 Full flush and feeler rails around all panels and assemblies unless otherwise specified.

20.0 All checking fixtures must have operation instructions which include a picture of the panel. This instruction sheet must be in an accessible area while the panel is in the gage.

21.0 All gage concepts and sketches require buy off by an Ogihara quality systems representative. If the gage manufacturer builds the gage without Ogihara approval, the supplier assumes all responsibilities that may occur if the gage is not built to OAC specifications.

22.0 All checking fixtures must have measuring points (SPC) labeled to customer specifications and nomenclature.

- 1.0 The supplier must verify the gage will comply with the part geometric dimensioning and tolerancing.
- 2.0 The supplier must verify that the gage will comply with all part measuring specifications provided by O.A.C.
- 3.0 The supplier is responsible to make sure that all tooling was built to design and that the data required for inspection matches. Also, all dimensional inspection reports prepared by the supplier should have sufficient check points to substantiate vendor certification.
- 4.0 Dimensional inspection reports are required on all checking fixtures, unless otherwise indicated on the purchase order. All data is to show part numbers and indicate R.H. or L.H. data for each unit and detail.
- 6.0 Establish whether checking fixtures, etc. should be source inspected or shipped to OAC for inspection. If the checking fixtures are rejected from OAC inspection, they will be returned to the supplier at the supplier's expense.
- 7.0 On any new dimensional reports prepared, all new data should accompany the fixture.
- 8.0 On all approved checking fixtures, place all inspection data and forms in an envelope and place in a shipping container along with one set of prints. This is applicable to fixtures shipped to stamping plants and purchased part suppliers who supply parts to OAC only. Copies of forms applicable and dimensional inspection data must be retained for future reference.

- 1.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 2.0 The checking fixture concept must clearly identify all master control holes & surfaces.
- 3.0 The checking fixture concept must include the most updated part outline. Product changes after fixture completion will be priced accordingly.

To be completed by Fixture Designer prior to OAC buy-off

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Date:	Percent:
Design Source:	Build Source:

	Fixture Design Checklist	Ok	Reject	Approved By
1	Design reflects proper part number and E.C. levels.			
2	Locators conform to customer GD&T.			
3	Locations of datums are identified.			
4	All measuring points are incorporated into design according to customer specifications.			
5	All coordinates for measuring points are listed on prints.			
6	All clamp pivot points are in line with pressure points.			
7	Adequate clearance is provided for part loading and unloading.			
8	All checking fixtures are practical and accessible.			
9	All swing and slide details are clear of other components.			
10	All swing and slide details fall within the confines of the base when they are in the opened position.			
11	All details and units are identified properly.			
12	Provisions have been made for handling.			
13	Lift cables and chains clear all fixture details.			
14	Overall size and weight has been reviewed for in plant use.			
15	Design addresses ergonomical and operational safety issues.			
16	Design to OAC or customer standards			

Comments/Concerns:

OAC Checking Fixture Engineer

Date:

OAC Quality Systems Engineer

Date:

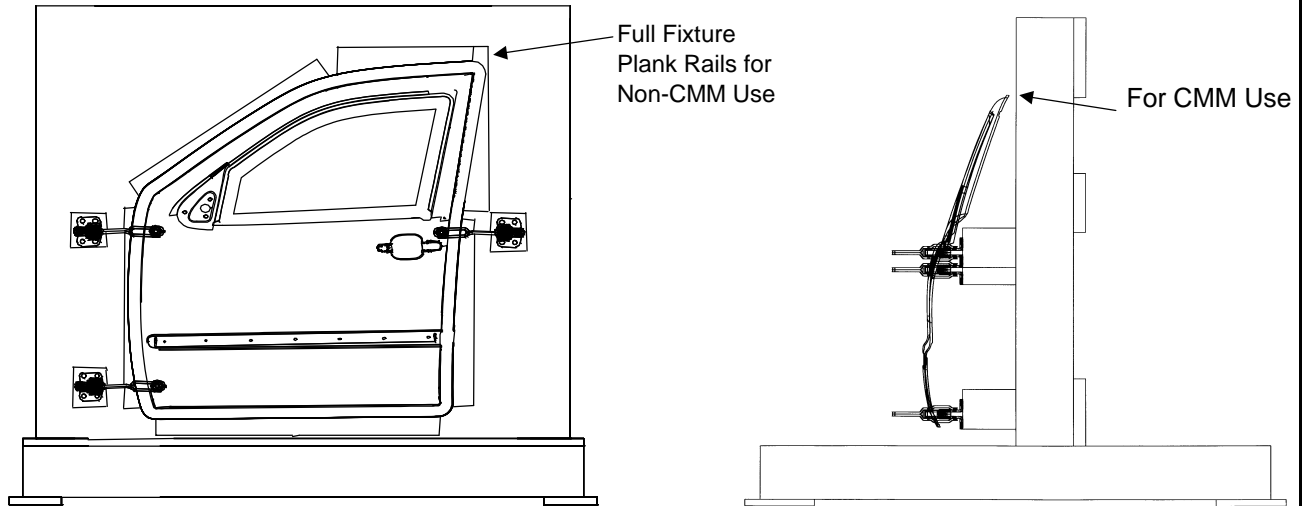
Manufacturing Source:

Date:

Customer approval:

Date:

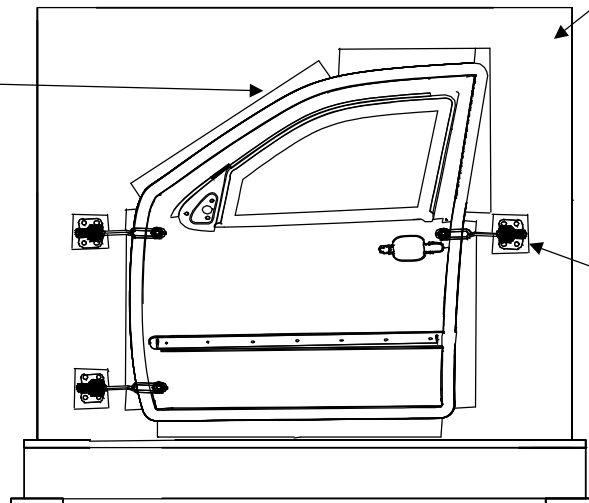
This is a typical Ogihara prototype assembly checking fixture.



All prototype assembly checking fixtures share the construction features as identified in the below examples

Step #1

Sub base
mounting
surface



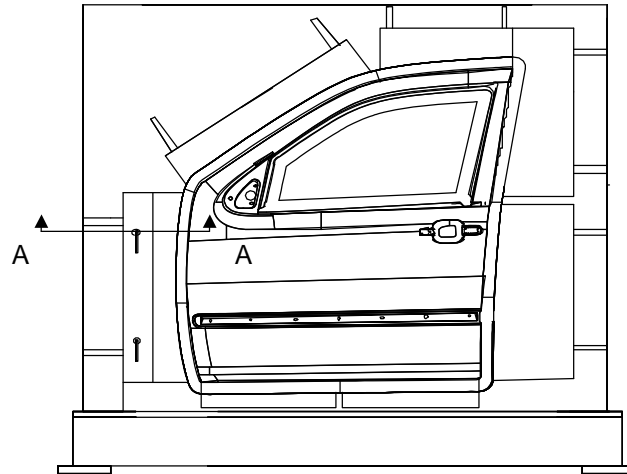
Fabricated Upright

Clamps and Nets
independent of the
sub base surfaces

Fabricated upright (Steel) to include machined base structure.

** This structure alone will act as a CMM holding fixture when required.

Step #2



Sub Base details require steel or aluminum construction.

Hardened "L" Pin Bushings required in each Sub Base for repeatable checking fixture assembly.

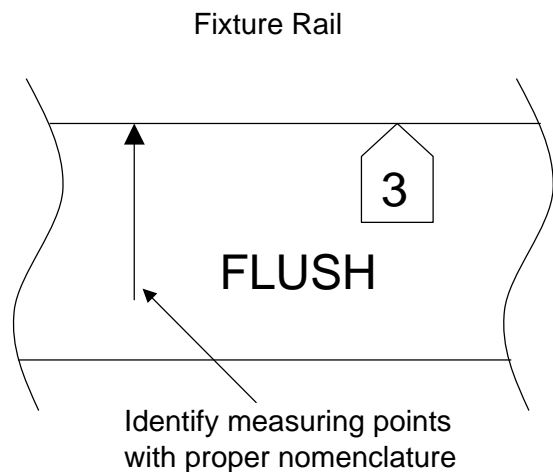
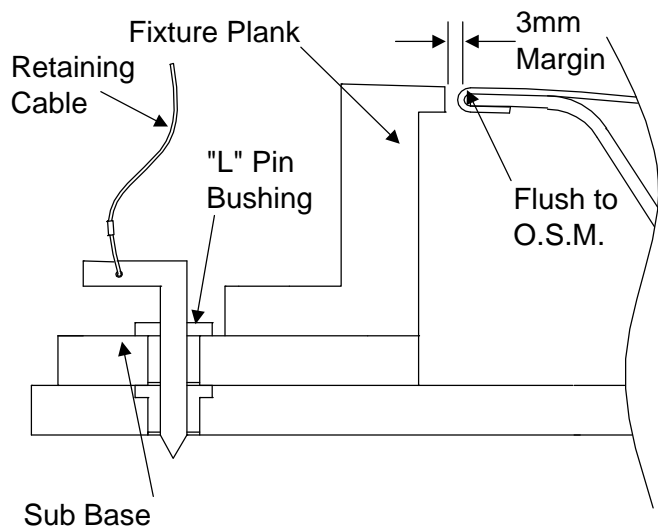
All Check Rails manufactured from Fixture Plank material.

Flush to O.S.M./Feeler 3mm from completed feature.

Identify all measuring points on the check fixture rails (see example).

** This structure will act as a Ring Gage when complete.

Section A-A



Step #3

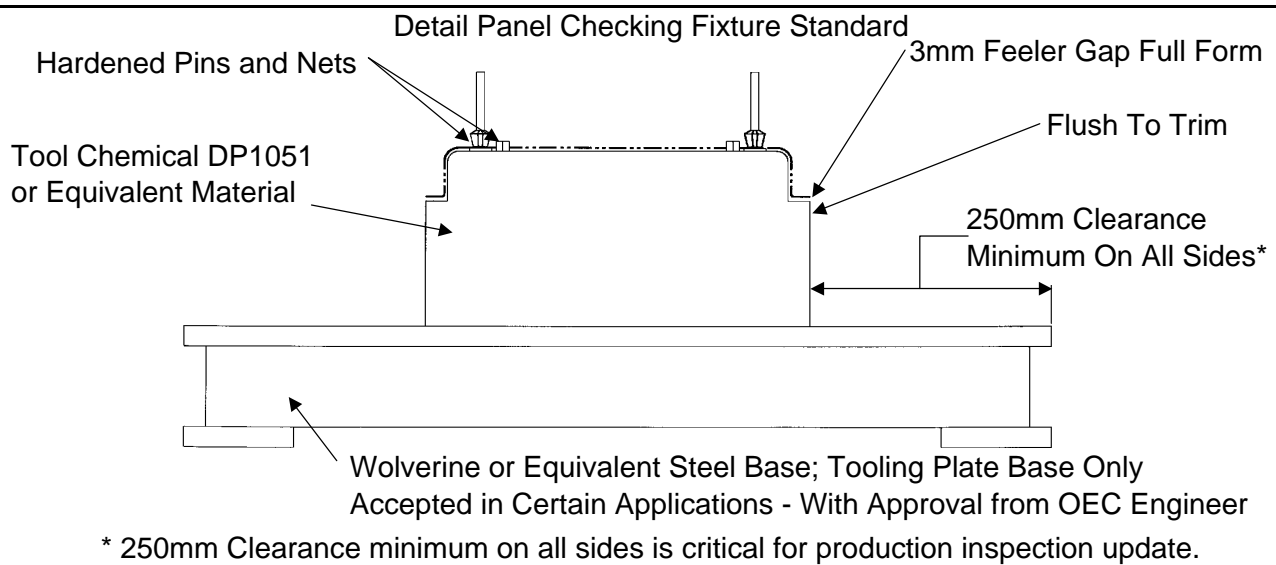
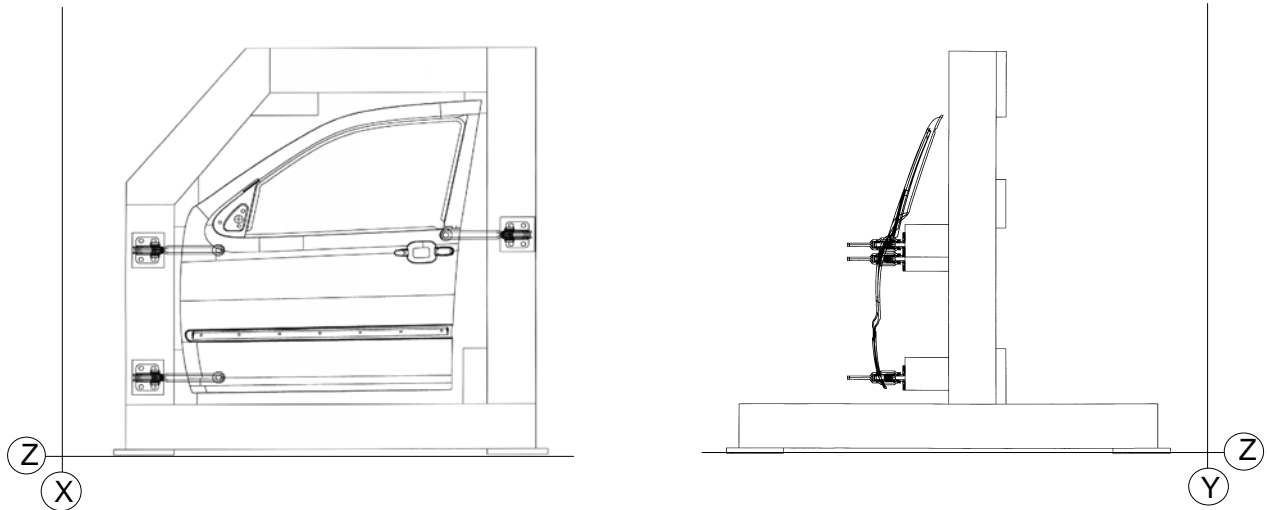
Add set up procedure and clamping sequence to gage.

Certify locators and check rails. Attach Ogihara buy off check list and E.C.N. tracking level plate.

Run Gage R prior to using the gage.

Contact Ogihara quality systems associate for final buy off.

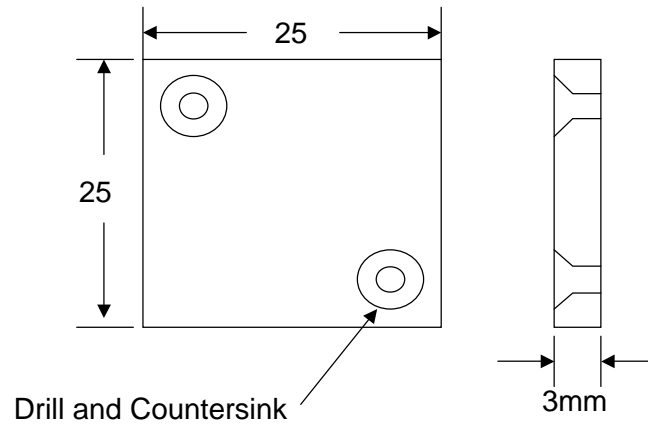
All shipping unit assembly checking fixtures in body position unless specified otherwise from Ogihara Quality Department.



Locator Net Pads

For all checking fixtures, all locator pads will be 25mm by 25mm square, unless specified by customer requirements and/or location restrictions. The pads must be hardened and ground to 3mm thick, unless otherwise specified.

In complex areas, locator pads must be N.C. cut to accommodate product surface.



Assembly checking fixtures which hold detail stampings must incorporate hardened steel locator pads for the assembly, and brass locator pads for the detail stamping. The brass locator pads must be identified and in a storage unit when not in use.

Plugs and Locator Pins

Plugs and pins on checking fixtures are used for locating a part and/or for checking location of holes. (Only upon request of the Process Engineer is a plug for checking hole size required.)

Use locating pins to locate the part when the part is not located by critical surfaces.

Use plugs to locate the part when the part is not located by critical surfaces and it is not practical to use locating pins.

Plugs are normally to be a two-step design, a pilot diameter and locating or checking diameter (see illustration).

Plugs, locating fingers, and locating pins must be hardened and ground.

Plugs and pins must be self-contained in checking fixture when practical.

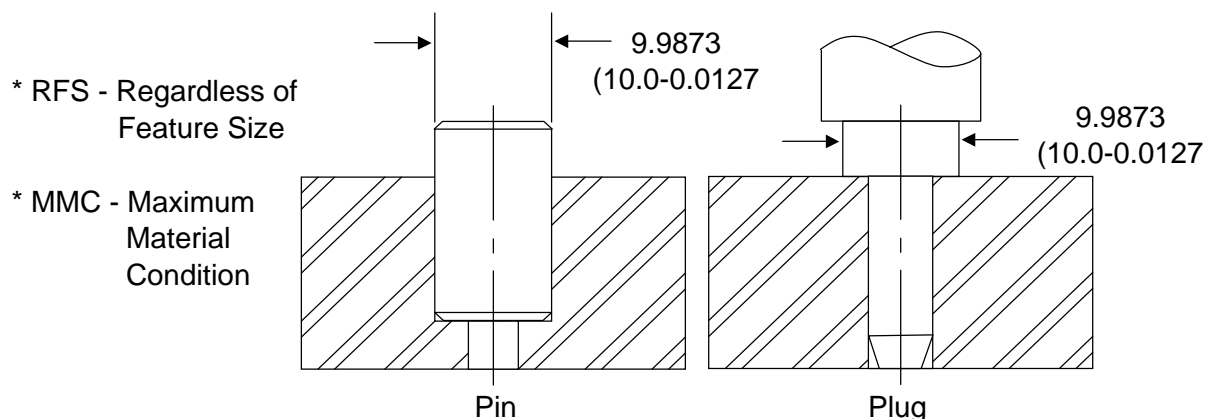
If a plug cannot be self-contained, then a nylon cable must be provided to attach a plug to the fixture. Means of storing plugs also must be provided.

Use a hardened bushing when plugging into a soft material such as Aluminum or Magnesium.

All plugs must have a minimum penetration into the fixture equal to the diameter of the pilot, before checking diameter makes contact with the panel. A ratio of 1-1/2 times the diameter is preferred. Provide an air-vent if the plug is used in a blind hole.

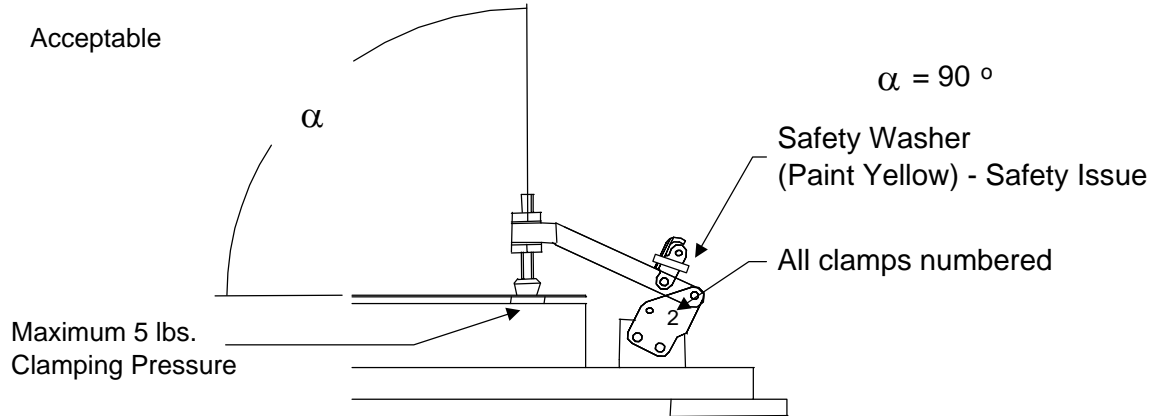
Gaging member of a plug must penetrate a minimum of 1.5mm beyond metal thickness of panel.

No taper (RFS) locating pins allowed, straight (MMC) pins only.



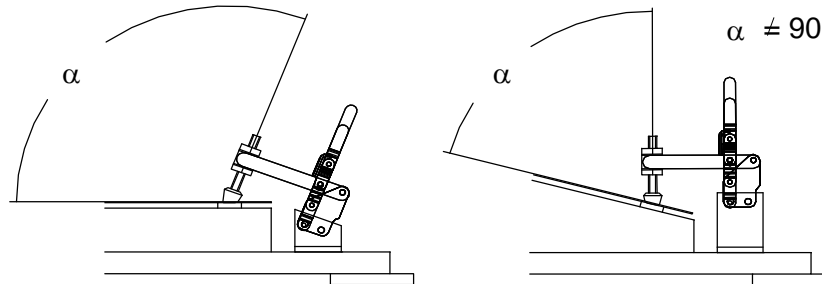
Clamping Specifications

Design all clamps 90 degrees to product.

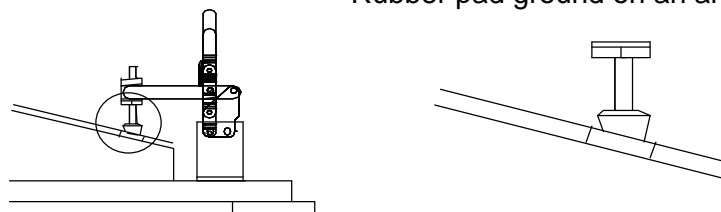


Not Acceptable

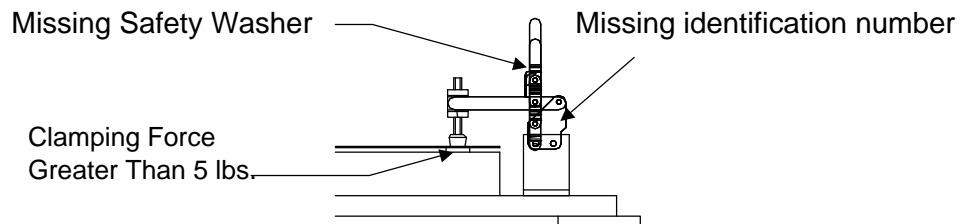
1)



2)



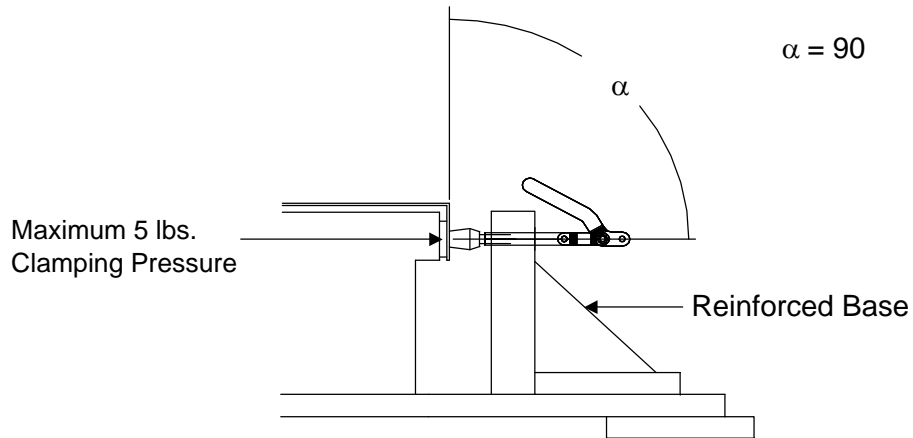
3)



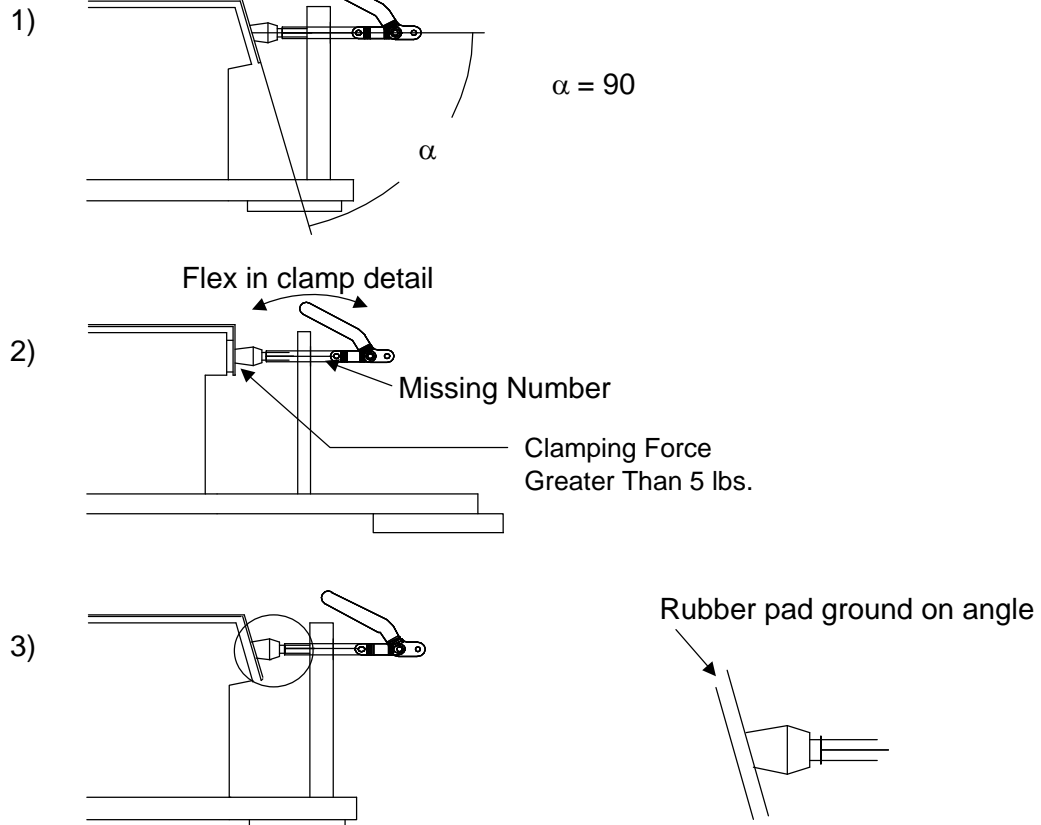
Clamping Specifications

Design all clamps 90 degrees to product.

Acceptable



Not Acceptable



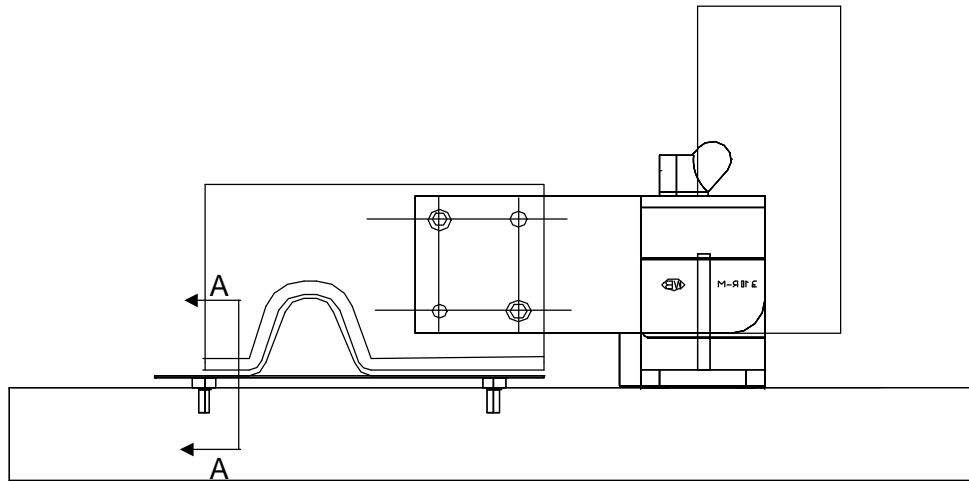
Template Drop Assembly Reference Information

All template construction to be free of movement when locked in position.

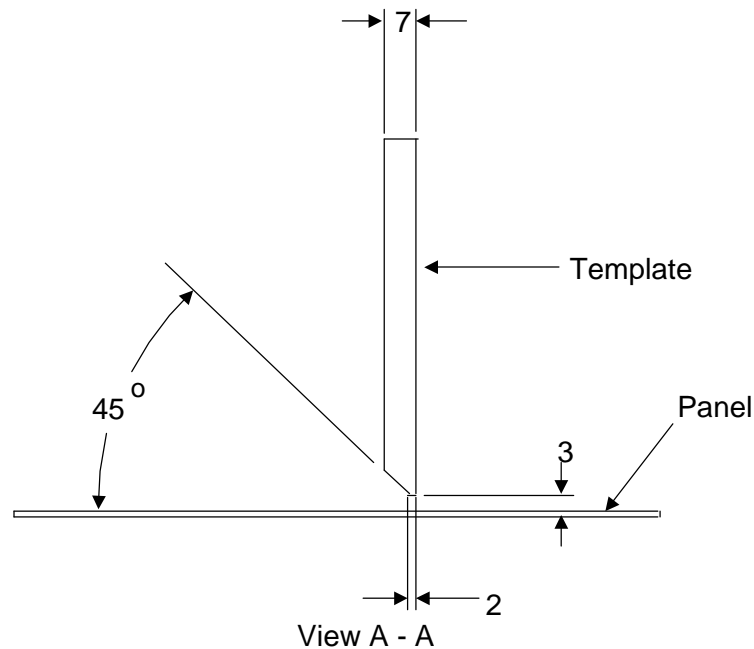
All templates and additional details to be Metric standard.

All templates must have 45 degree chamfer (see sketch).

Wolverine Bronze or equivalent quality template drop assembly required.



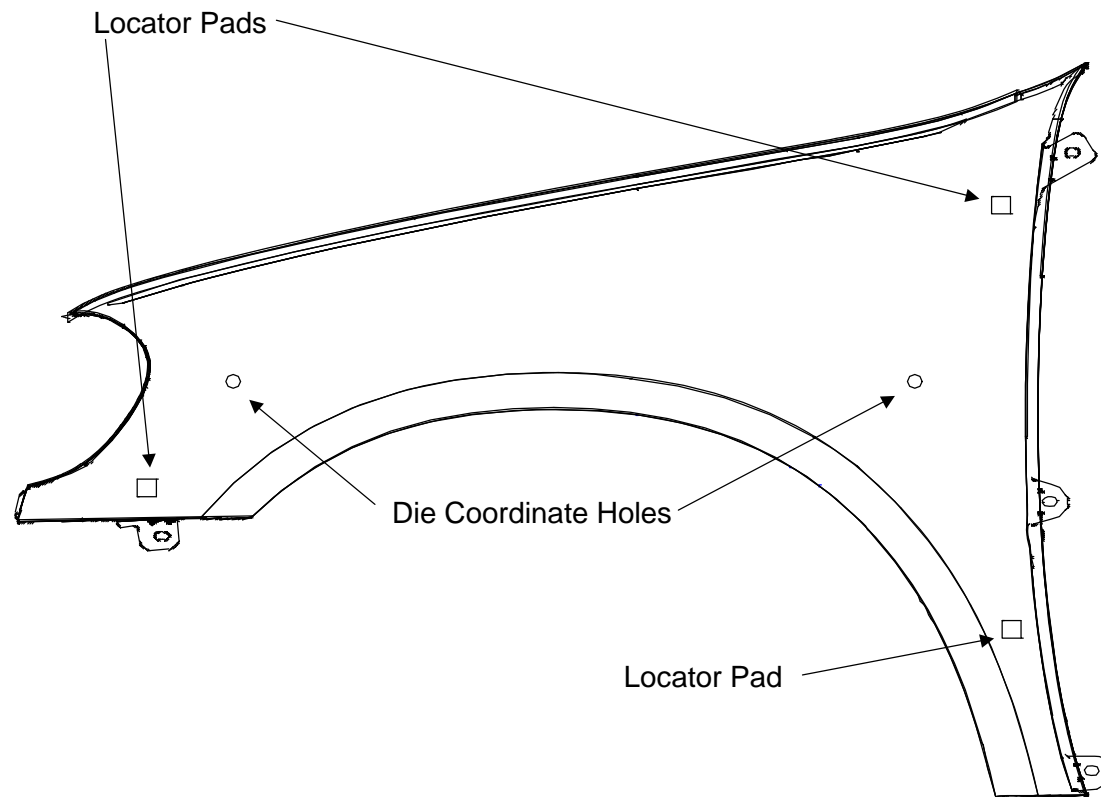
Reference dimensions for template construction



Die Development Locators

Fixture build companies may be requested to add die development locators to the checking fixture.

These locators are used by OAC's die suppliers to develop dies and to measure variation between die processes during die tryout.



Die development locators may consist of 3 or more 25mm by 25mm locator pads on the bottom of the draw surface.

There will also be two die coordinate holes to locate the panel in the secondary and tertiary axis.

Ogihara Checking Fixture Tolerances

These tolerances are to be used in the construction and certification of stamping/assembly checking fixtures unless otherwise specified by Ogihara America Corporation - Quality Tooling department.

1. CMM starts to machined edge of base = $\pm 0.125\text{mm}$
2. Surface locators to CMM starts = $\pm 0.05\text{mm}$ controlling direction.
3. Locators to CMM starts = $\pm 0.2\text{mm}$ non-controlling direction.
4. Positional tolerance of pin locator to CMM starts = $\pm 0.05\text{mm}$.
5. Nominal pin diameter is to be M.M.C. of hole design as toleranced.
6. Pin diameter tolerance is $\pm 0.0127\text{mm}$.
7. Check rails profile to CMM starts = $\pm 0.15\text{mm}$.
8. (4) way (H) locator pin to - (2) way (H) locator pin relationship = $\pm 0.05\text{mm}$ controlling direction.
9. (4) way (H) locator pin - (2) way (H) locator pin relationship = $\pm 0.1\text{mm}$ non-controlling direction.
10. Template (flipper details) surface profile = $\pm 0.15\text{mm}$.
11. Probe bushing for Data Myte measuring points from CMM starts $\pm 0.20\text{mm}$ non-controlling direction.
12. Probe bushing for Data Myte measuring points from CMM starts $\pm 0.10\text{mm}$ controlling direction.
13. Base must have a flat and parallel to $\pm 0.10\text{mm}$.
14. Base must be level to 0.125 total overall tolerance.
15. Generic holding fixture - columns machined flatness and parallel hole to hold = $\pm 0.05\text{mm}$.
16. Generic holding fixture - columns square to base within 0.075mm.
17. Master Body Gage (Blue Buck) overall tolerance from front to back = $\pm 0.13\text{mm}$ all directions.
18. Master Body Gage locating pin relationships, pin to pin = $\pm 0.13\text{mm}$ all directions.
19. Check rail flush, check trim line 90 degrees to surface of metal when angle is over 7 degrees.
20. Check rail flush, check trim line to surface of base when angle is under 7 degrees.

OGIHARA AMERICA CORPORATION CHECK FIXTURE SET UP INSTRUCTIONS

CUSTOMER:

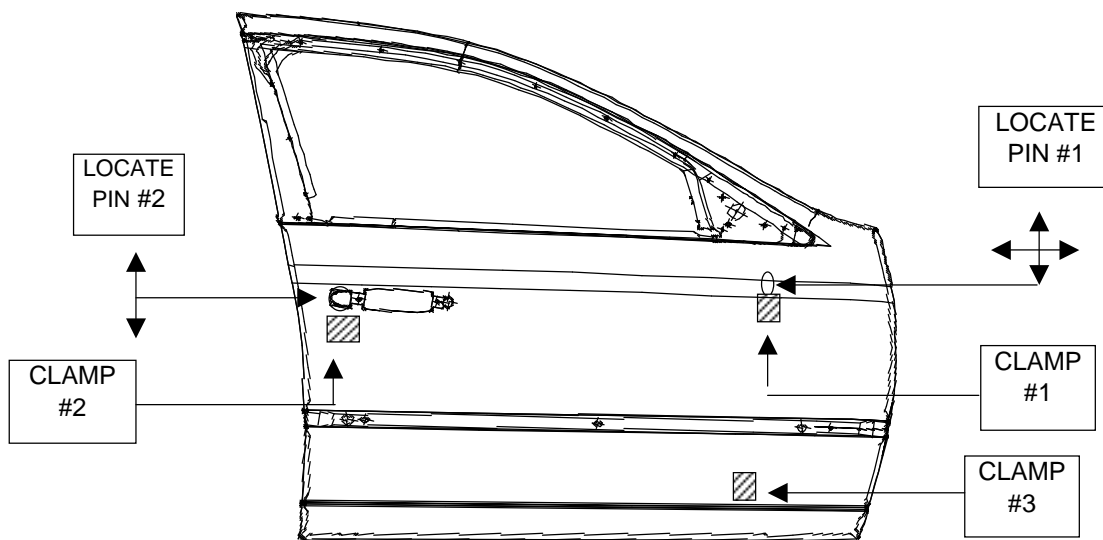
FORD WIXOM

PART NAME:

DEW (98) RH FRT DR ASSY

PART NUMBER:

XW43-5420124



- 1.) LOAD PART ON TO LOCATOR PINS #1 AND 2.
- 2.) GO TO THE BACK OF THE FIXTURE AND SET CLAMPS 1,2 & 3.
THE #4 CLAMP IS USED FOR INNER SUB ASSY ONLY.
- 3.) SLIDE WINDOW DETAILS AND PIN THEM IN PLACE.
- 4.) PERFORM ALL SIGHT CHECKS.
- 5.) VERIFY ALL NETS WITH .10mm FEELER. RESET PART IF NECESSARY. CONTACT FACILATOR IF PROBLEM CONTINUES.
- 6.) COMPLETE ALL LEVEL 4 POINTS, REFER TO POINT & METHOD.

4.2.P1.M1

To be completed by Fixture Manufacturer prior to OAC buy-off

Date: _____

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Checking Fixture Engineer:	
Build Source:	

	Fixture Construction Checklist	Ok	Reject	Approved By
1	Approved Design signed off by OAC Representative.			
2	Latest E.C incorporated & stamped on tag.			
3	Fixture built to design.			
4	Fixture built to OAC standards.			
5	Templates operational.			
6	Locking pins operational.			
7	Flush checks identified.			
8	Feeler checks identified (3mm).			
9	Sight checks.			
10	Probe / SPC checks operational.			
11	Clamps (90 deg., numbered, operational).			
12	Locators / Locating scheme (OAC approved)			
13	Measuring points identified to customer specs. (OAC approved)			
14	Fixture built in body position (or 90 deg.)			
15	Body lines identified.			
16	Start points identified.			
17	Check rails.			
18	Hand applies.			
19	Plug checks / Keepers - Cables.			
20	Gage / Scribe pins (Fit to bushings).			
21	Proper paint scheme.			
22	Sequence of operations / Tags / Attached in clear view.			
23	Safety hoist rings / Eye bolts / Handling holes / Carts.			
24	Gage R&R.			
25	Fixture Certification.			
26	Electronic fixture design received.			

Comments/Concerns:

_____	Date: _____
OAC Quality Tooling Engineer	
_____	Date: _____
OAC Engineer	
_____	Date: _____
Manufacturing Source:	

- 1.0 RFS locating pins are not permissible under any condition. MMC pins only.
- 2.0 Stamp actual start dimensions in three planes and identify with "mm" symbol.
- 3.0 Stamp or identify the amount of feeler clearance between part and checking surface, (to be visible when part is in fixture) and identify with "mm"
- 4.0 Stamp or identify surfaces used for flush checking with the word "Flush".
- 5.0 Stamp the following information on identification plate: fixture number, part number, that the fixture also checks. Actual weight, part name, engineering level, construction source and inspectors identification.
- 6.0 Break all sharp corners.
- 7.0 Construction balls remain with fixtures and be covered with protective caps.
- 8.0 Set-up lines and line block location must be identified.
- 9.0 Clamps, Hinges, Flippers, Plugs, and Slides must be in working condition and free of play. This applies to commercial and non-commercial details.
- 10.0 Deviations from tool drawing must be in writing and approved by plant manufacturing engineering and checking fixture design section (staff).
- 11.0 Use dowels and socket head cap screws unless otherwise shown.
- 12.0 All fixture hardware and fasteners must be Metric standard.
- 13.0 Interchangeable details are to be mounted on fixture unless shown otherwise. Non-Mounted units mounted units must be shipped in same crate as fixture.
- 14.0 All Non-gaging surfaces are to be painted with specified enamel and metal checking surfaces must be surfaces must be oxidized. Observe all color code specification identified at line up and according to this standard manual.

15.0 Checking fixture color specifications:

Rest Area	Bright yellow
Master Control Surface	Bright orange
Detail Panel C/F inspection surf.	Gray, with black sight check features
Steel assembly checking fixtures	The same color as the project dies and assembly equipment

16.0 It is the supplier's responsibility to understand all customer locating drawings. Example: Ford Ideas, Metaphase system.

17.0 All gages will be designed with the clamps and nets independent of the checking fixture form rail.

18.0 All checking fixtures will have the identification plate mounted in an accessible area while the panel is in the gage.

19.0 Full flush and feeler rails around all panels and assemblies unless otherwise specified.

20.0 All checking fixtures must have operation instructions which include a picture of the panel. This instruction sheet must be in an accessible area while the panel is in the gage.

21.0 All gage designs require design buy off by an Ogihara quality systems representative. If the gage manufacturer builds the gage without Ogihara approval, the supplier assumes all responsibilities that may occur if the gage is not built to OAC specifications.

22.0 All checking fixtures must have measuring points (SPC) labeled to customer specifications and nomenclature.

- 1.0 The supplier must verify the gage will comply with the part geometric dimensioning and tolerancing.
- 2.0 The supplier must verify the gage will comply with all part measuring specifications.
- 3.0 The supplier is responsible to make sure that all tooling was built to design and that the data required for inspection matches. Also, all dimensional inspection reports prepared by the supplier should have sufficient check points to substantiate vendor certification.
- 4.0 Dimensional inspection reports are required on all checking fixtures, unless otherwise indicated on the purchase order. All data is to show part numbers and indicate R.H. or L.H. data for each unit and detail.
- 5.0 Specific construction and inspection data required will also be shown on each fixture or gage design.
- 6.0 Establish whether checking fixtures, etc. should be sourced inspected or shipped to OAC for inspection. If the checking fixtures are rejected from OAC inspection, they will be returned to the supplier at the supplier's expense.
- 7.0 On any new dimensional reports prepared, all new data should accompany the fixture.
- 8.0 On all approved checking fixtures, place all inspection data and forms in an envelope and place in a shipping container along with one set of prints. This is applicable to fixtures shipped to stamping plants and purchased part suppliers who supply parts to OAC only. Copies of forms applicable and dimensional inspection data must be retained for future reference.

- 1.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 2.0 The checking fixture design must clearly identify all master control holes & surfaces.
- 3.0 The checking fixture design must clearly identify all measuring point features.
- 4.0 The gage design must include the most updated part outline.
- 5.0 Completed CAD designs are to include all rail surface data, as well as structure. All revisions and / or engineering changes that affect require the same.
- 6.0 The design intent should include specific gage requirements including written descriptions.
- 7.0 The design must consider the environment in which the gage is to be used when choosing material, pins, clamps, etc., and ensure that they will remain functional throughout the life of the gage.
- 8.0 All check surfaces must be clearly identified using a separate color.
- 9.0 OAC Customer design reviews will be conducted at concept, 50%, and 90% prior to design buyoff.
- 10.0 OAC requires a sequence of operations "sign off".
- 11.0 (1) Key sheet required per set of designs.
- 12.0 Ogihara CUSTOMER standard title block required on all design sets.
- 13.0 The supplier may utilize any of the following media types: CD ROM. Suppliers may also directly connect via phone lines, Win 95, NT 4.0, or above are required.

- 1.0 CAD data, Part prints, Die models, Master templates, Mylar prints, and / or Numerical Control tapes are to be used in the design of checking fixtures.
- 2.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 3.0 The checking fixture design must clearly identify all master control holes & surfaces.
- 4.0 The checking fixture design must clearly identify all measuring point features.
- 5.0 The gage design must include the most updated part outline.
- 6.0 The design intent should include specific gage requirements including written descriptions.
- 7.0 The design must consider the environment in which the gage is to be used when choosing material, pins, clamps, etc., and ensure that they will remain functional throughout the life of the gage.
- 8.0 All check surfaces & locators must be clearly identified.
- 9.0 OAC Customer design reviews will be conducted at concept, 50%, and 90% prior to design buyoff.
- 10.0 OAC requires a sequence of operations "sign-off".
- 11.0 (1) Key sheet is required per set of designs.
- 12.0 Ogihara CUSTOMER standard title block is required on all design sets.
- 13.0 All drawings must be full sized & accurate representations of the dimensions shown. Out of scale dimensions are not permitted.
- 14.0 Original designs must be drawn or plotted on Mylar.

CHECKING FIXTURE SPECIFICATIONS

DESIGN BUY-OFF REPORT

To be completed by Fixture Designer prior to OAC buy-off

Date: _____

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Checking Fixture Engineer:	
Design Source:	Build Source:

	Fixture Design Checklist	OK	Reject	Approved By
1	Design reflects proper part number and E.C. levels.			
2	Locators conform to customer GD&T.			
3	Locations of datums are identified.			
4	All measuring points are incorporated into design according to customer specifications.			
5	All coordinates for measuring points are listed on prints.			
6	All clamp pivot points are in line with pressure points.			
7	Adequate clearance is provided for part loading and unloading.			
8	All checking fixtures are practical and accessible.			
9	All swing and slide details are clear of other components.			
10	All swing and slide details fall within the confines of the base when they are in the opened position.			
11	All details and units are identified properly.			
12	Provisions have been made for handling.			
13	Lift cables and chains clear all fixture details.			
14	Overall size and weight has been reviewed for in plant use.			
15	Design addresses ergonomical and operational safety issues.			
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Comments/Concerns:

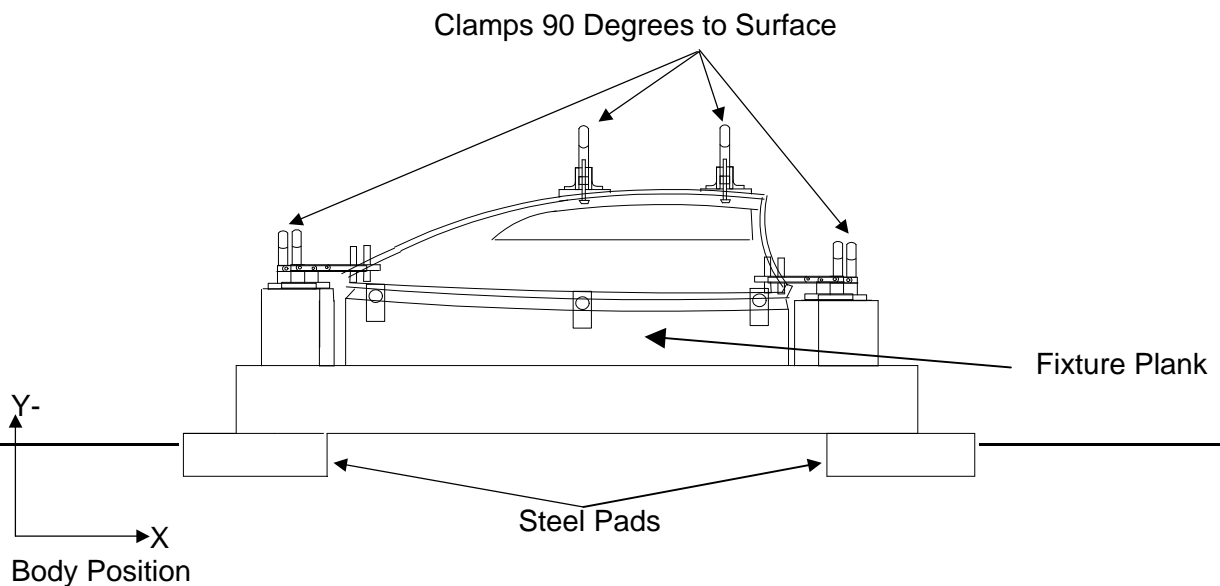
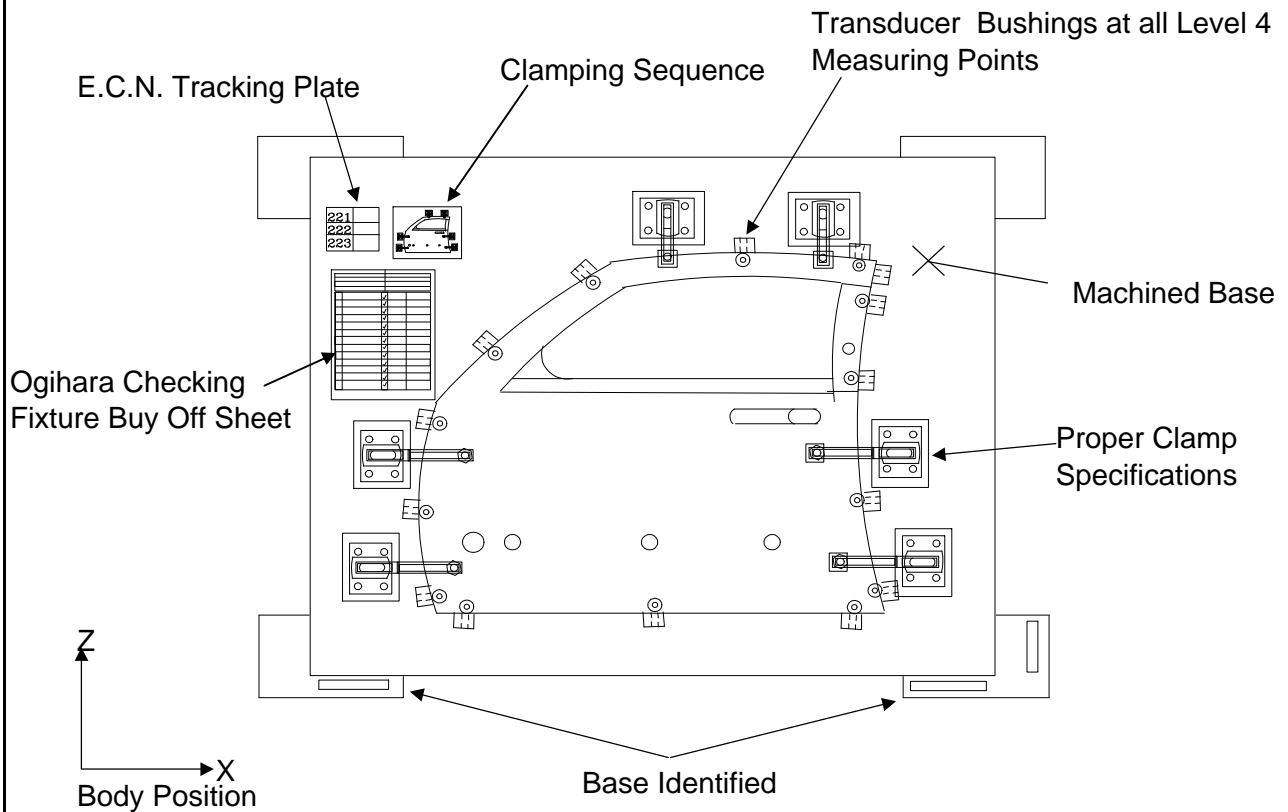
OAC Engineer

Date: _____

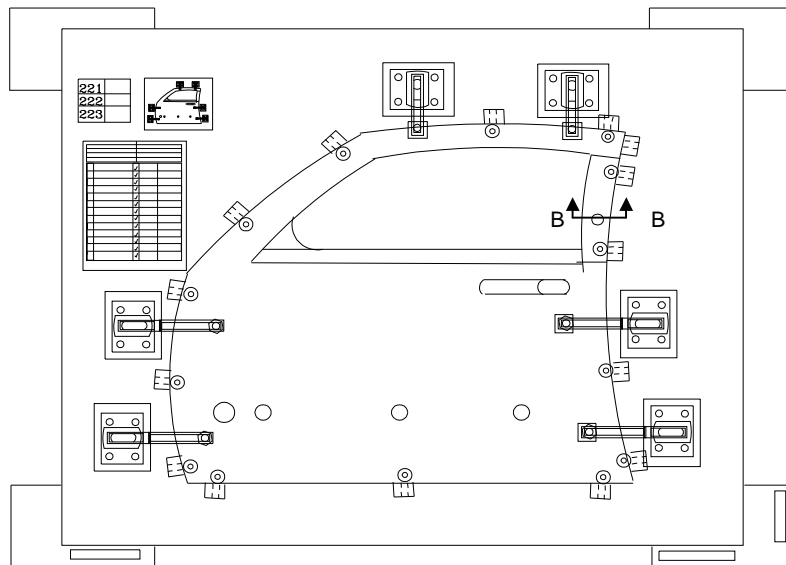
Manufacturing Source:

Date: _____

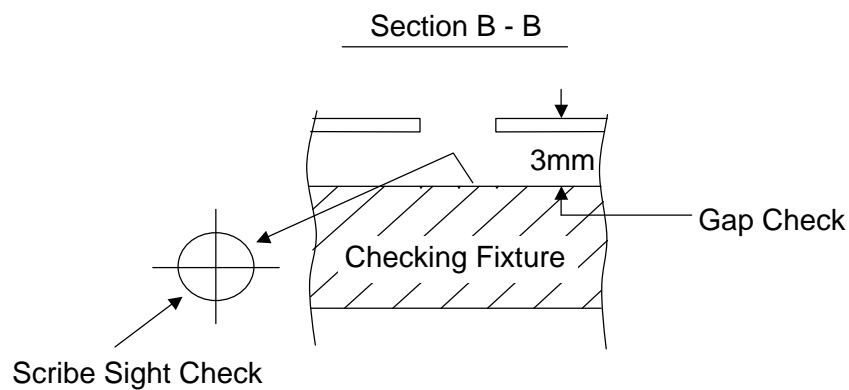
This is a typical Ogihara production detail panel checking fixture.



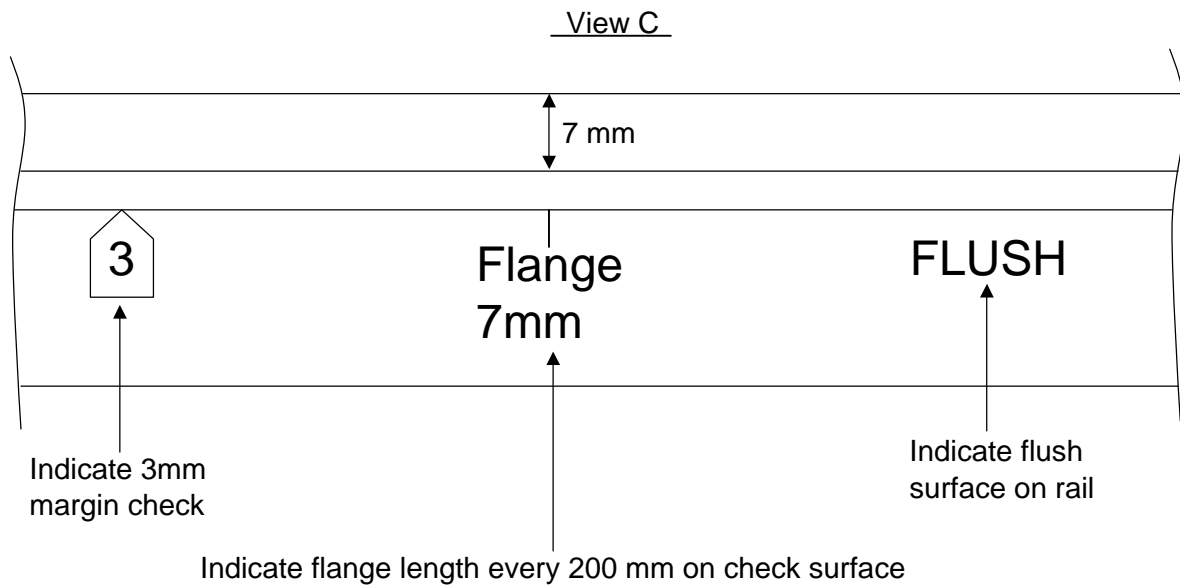
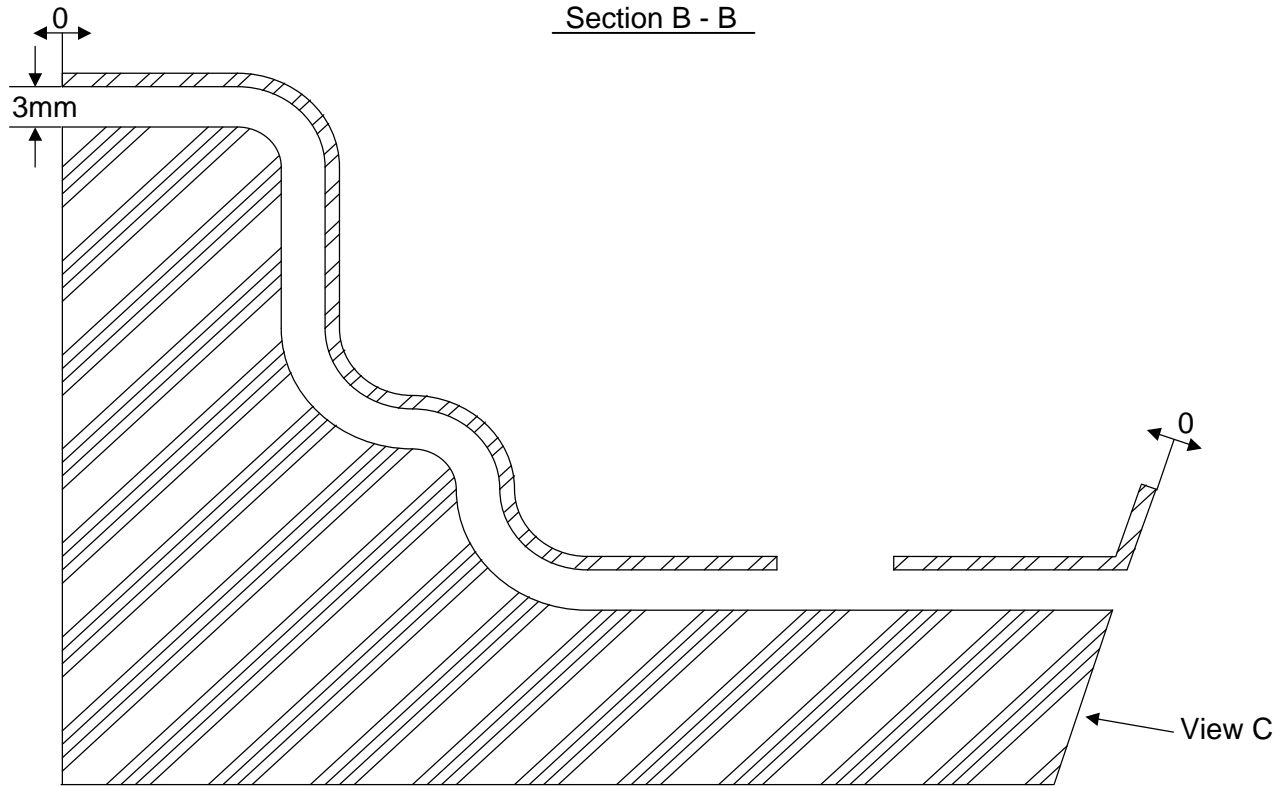
Construction features of production detail panel checking fixtures.



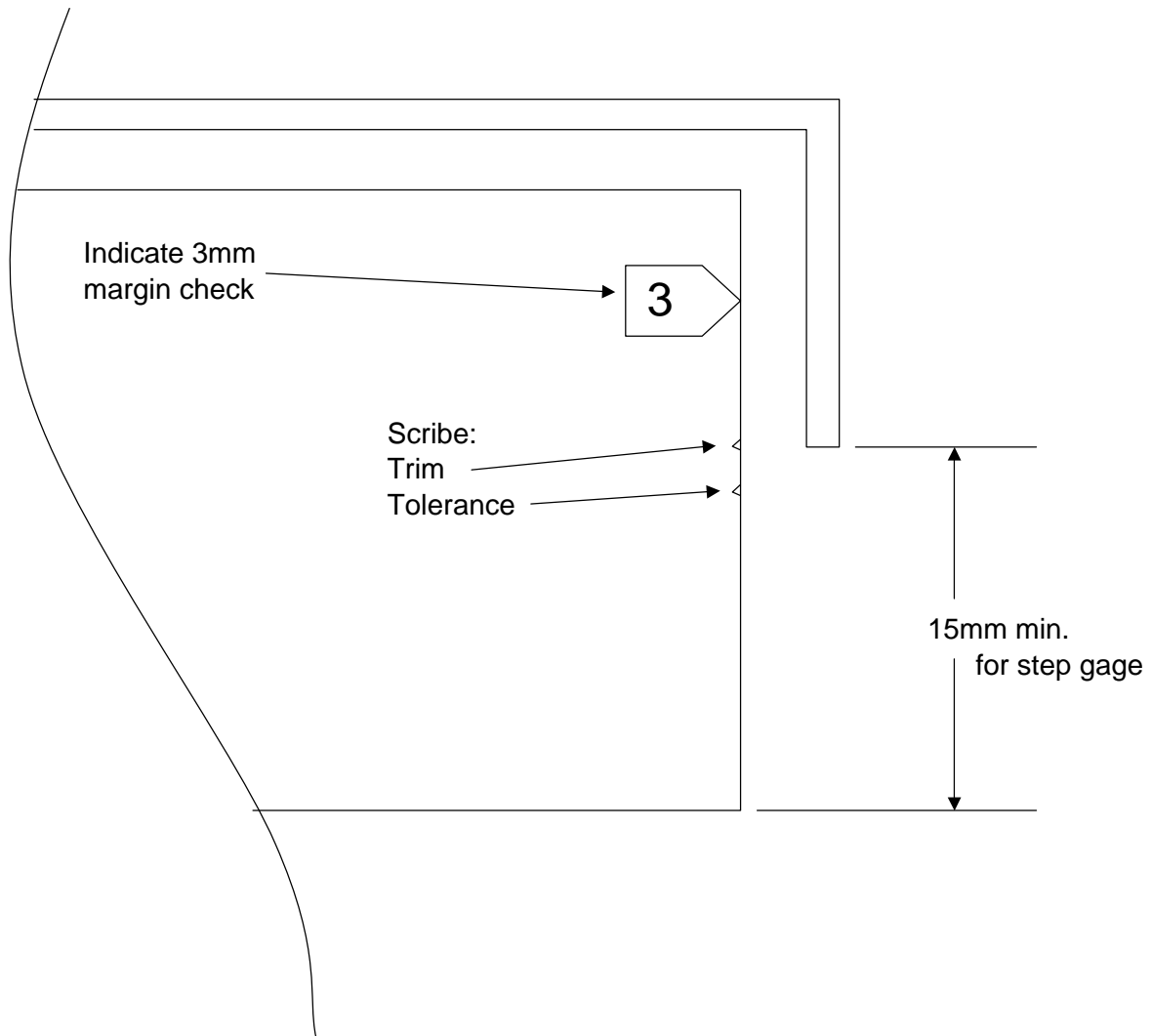
All holes require sight checks.



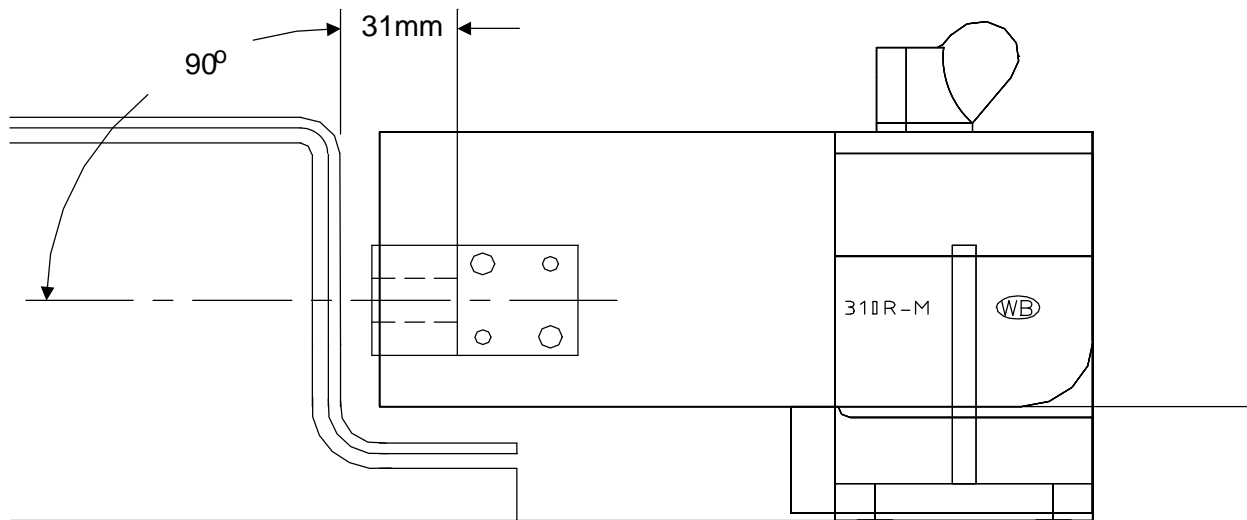
Full Flush and Feeler around periphery of panel required.



Acceptable trim check methods.



Transducer standards for detail production checking fixtures.



Typical drop template detail transducer bushing assembly

Template is Wolverine Bronze or Equivalent quality.

No shake in template drop.

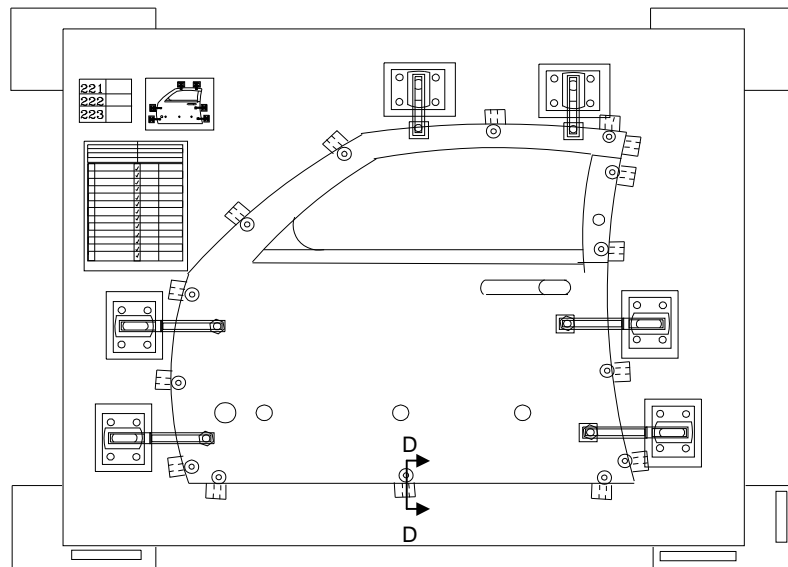
31mm nominal transducer set up.

Template drop 90 degrees from inspection surface.

Dowel transducer bushing details in position.

Number all transducer bushings.

Transducer standards for detail production checking fixtures.

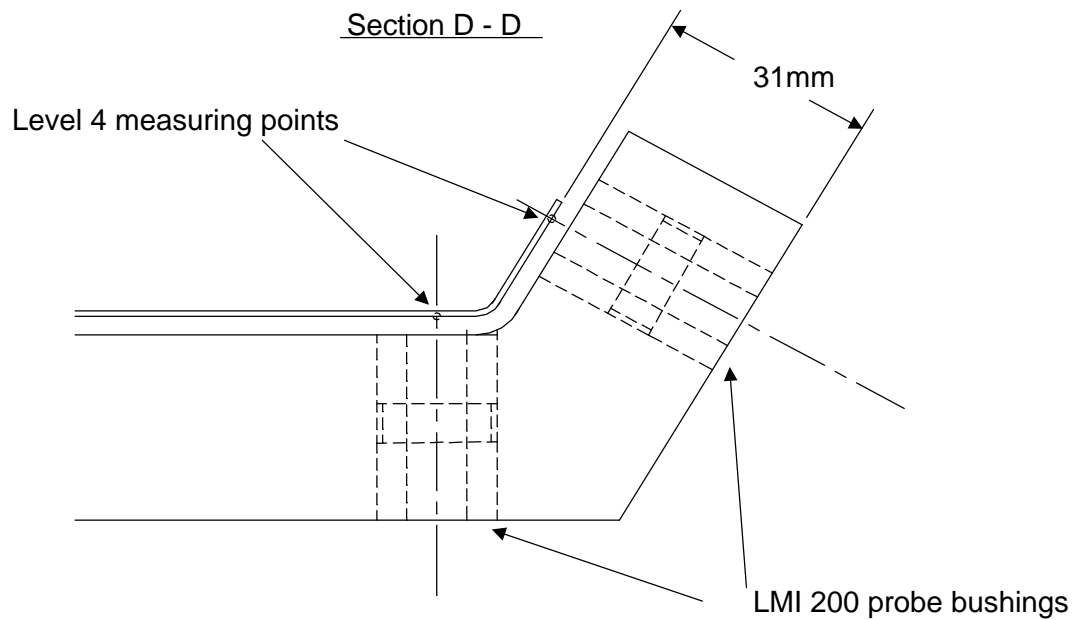


All transducer bushings L.M.I. 200 or equivalent quality.

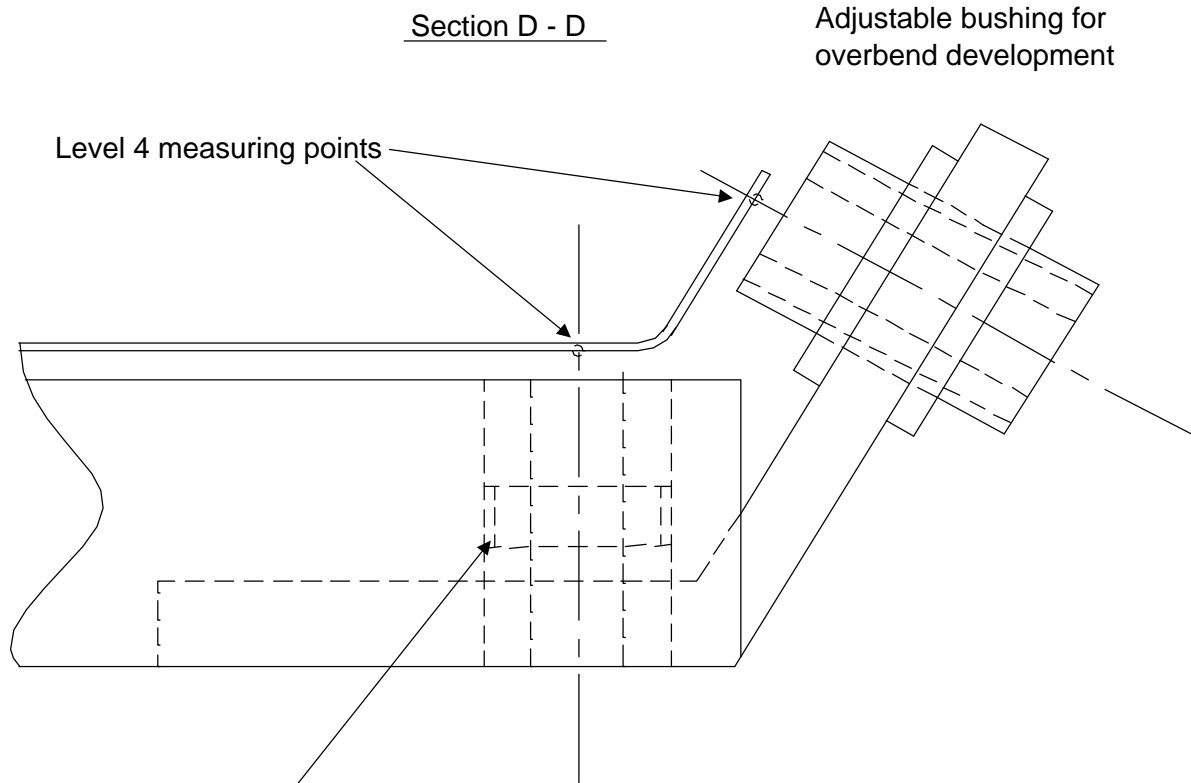
All bushings 90 degrees to the inspected surface.

31mm nominal for all transducer bushings.

Number all bushings with the customer's identification.



Adjustable bushing development and use for production detail panel checking fixtures.



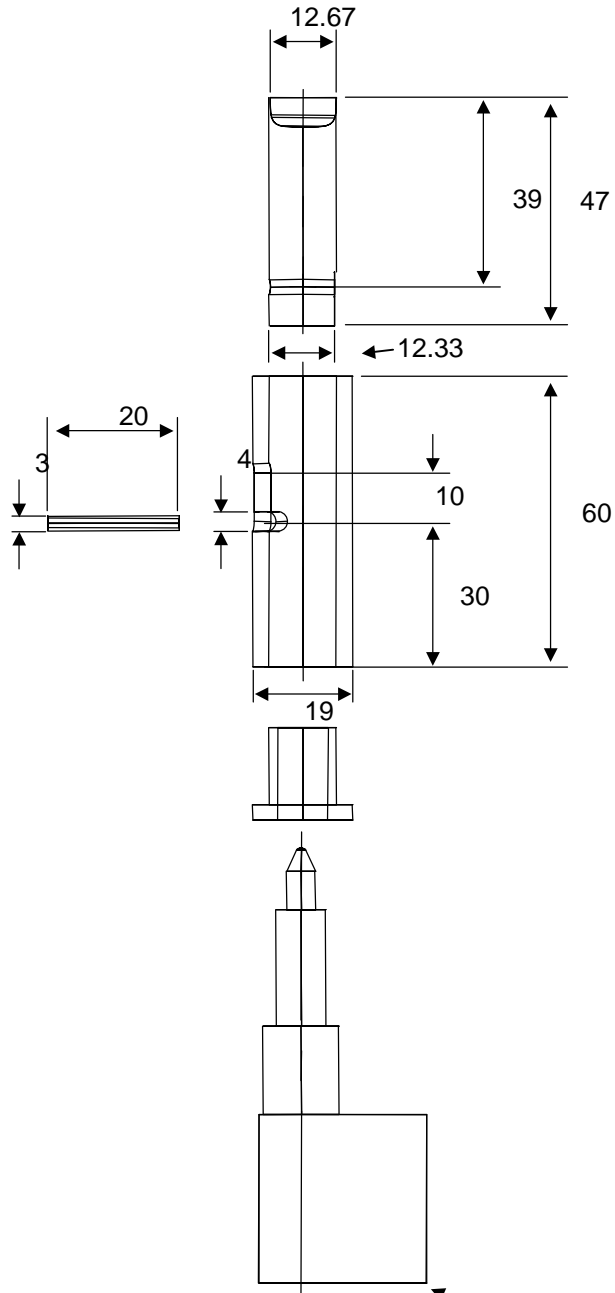
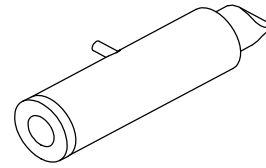
All permanent transducer bushings will have a feature which will allow the main fixture material to securely bond the bushing in place. Bushings which do not exhibit this feature and fail will be replaced at the supplier's expense.

Adjustable Bushings are used for overbend development.

- 1) Full fixture ring is developed to product nominal.
- 2) Adjustable transducer bushings are set to predetermined settings according to the die layouts.
- 3) At time of product and process acceptance, lock all adjustable bushings in place with a tack weld.

Ogihara standard trim and hem edge check detail.

Use on all Detail and Assembly Checking
Fixture trim and hem edge measuring points.



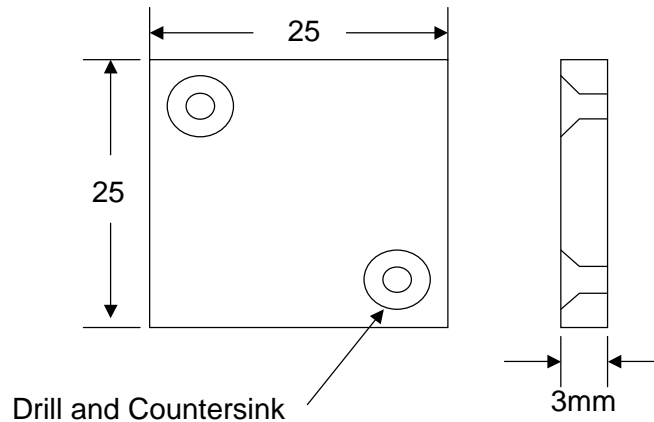
Check Detail

LMI-200 Transducer Probe

Locator Net Pads

For all checking fixtures, all locator pads will be 25mm by 25mm square, unless specified by customer requirements and/or location restrictions. The pads must be hardened and ground to 3mm thick, unless otherwise specified.

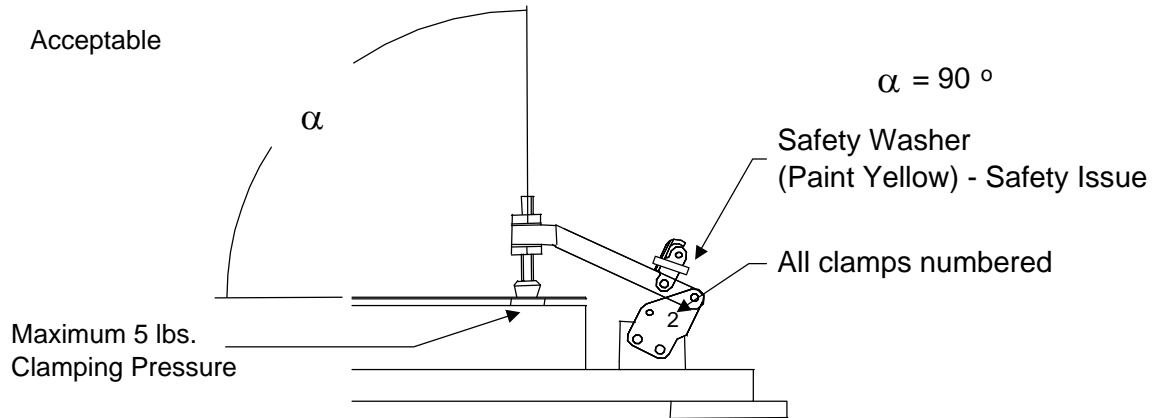
In complex areas, locator pads must be N.C. cut to accommodate product surface.



Assembly checking fixtures which hold detail stampings must incorporate hardened steel locator pads for the assembly, and brass locator pads for the detail stamping. The brass locator pads must be identified and in a storage unit when not in use.

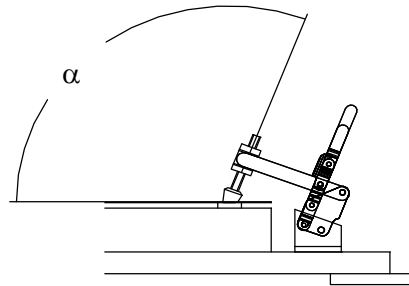
Clamping Specifications

Design all clamps 90 degrees to product.

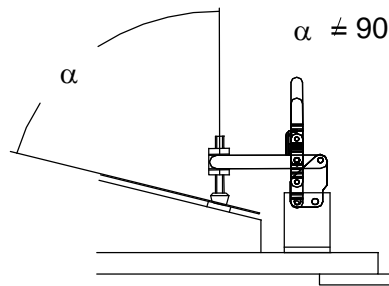


Not Acceptable

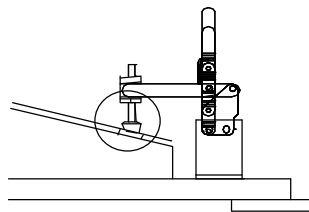
1)



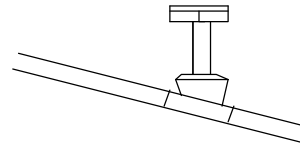
$\alpha \neq 90^\circ$



2)



Rubber pad ground on an angle.

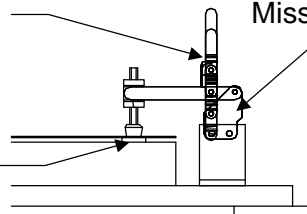


3)

Missing Safety Washer

Missing identification number

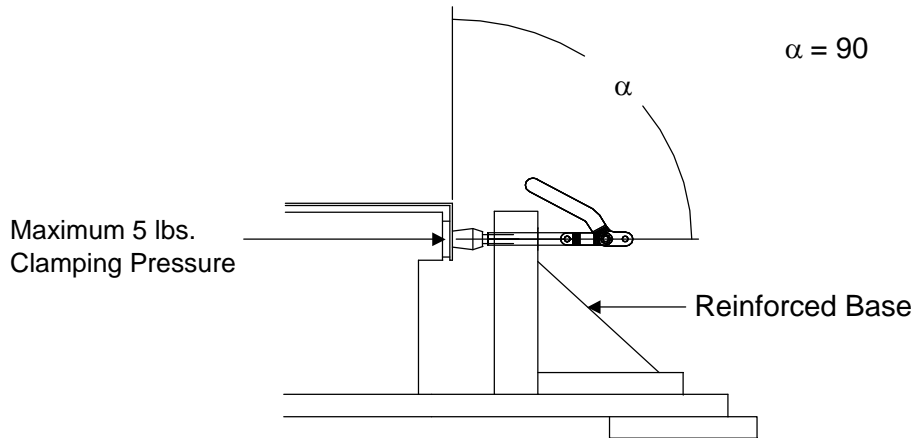
Clamping Force
Greater Than 5 lbs.



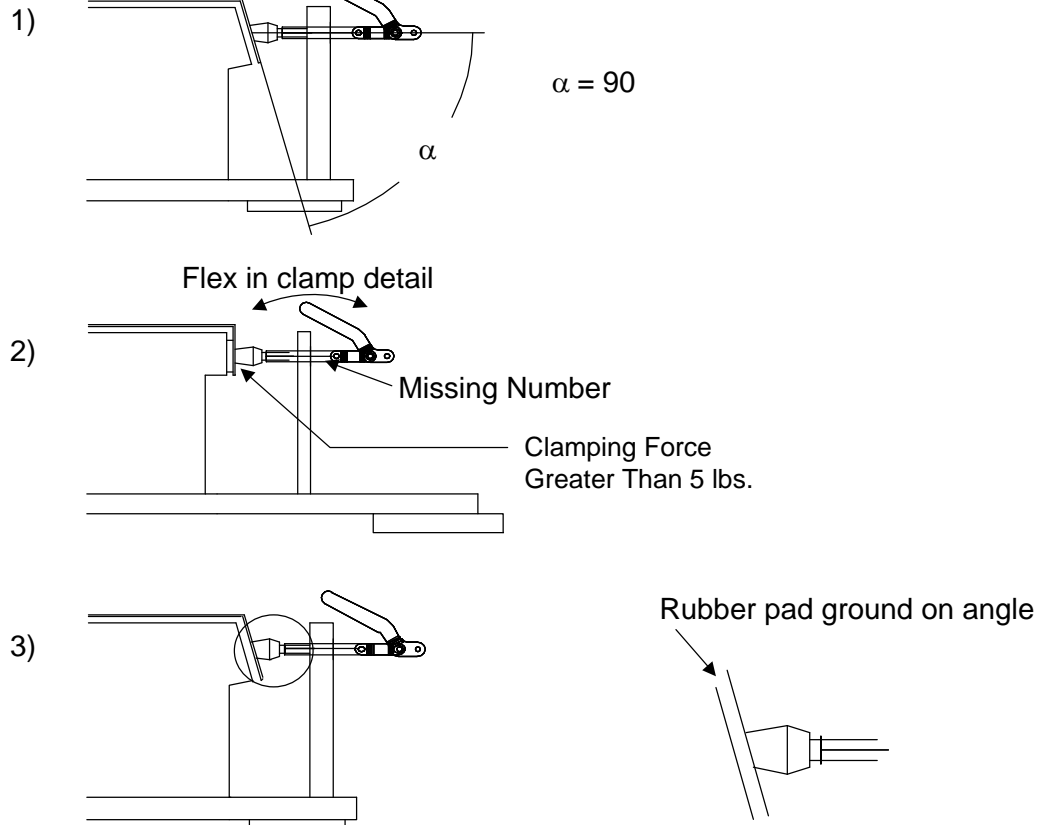
Clamping Specifications

Design all clamps 90 degrees to product.

Acceptable



Not Acceptable



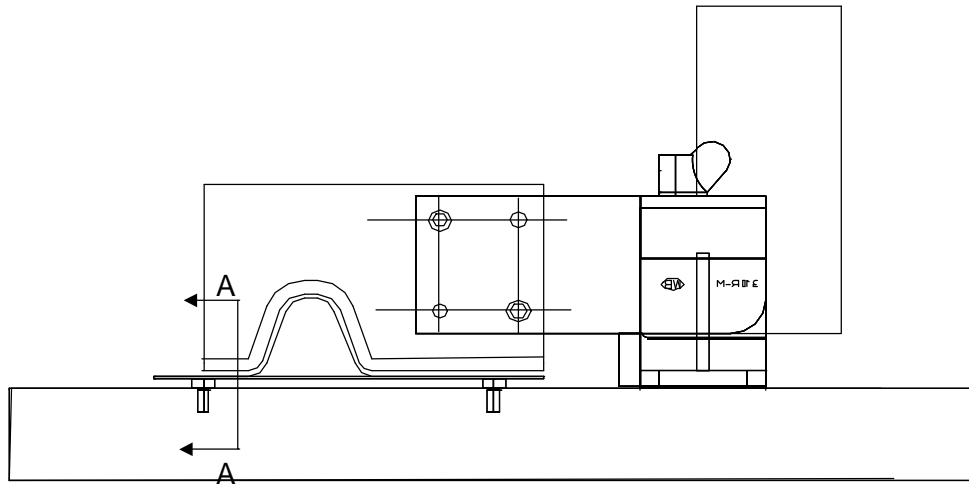
Template Drop Assembly Reference Information

All template construction to be free of movement when locked in position.

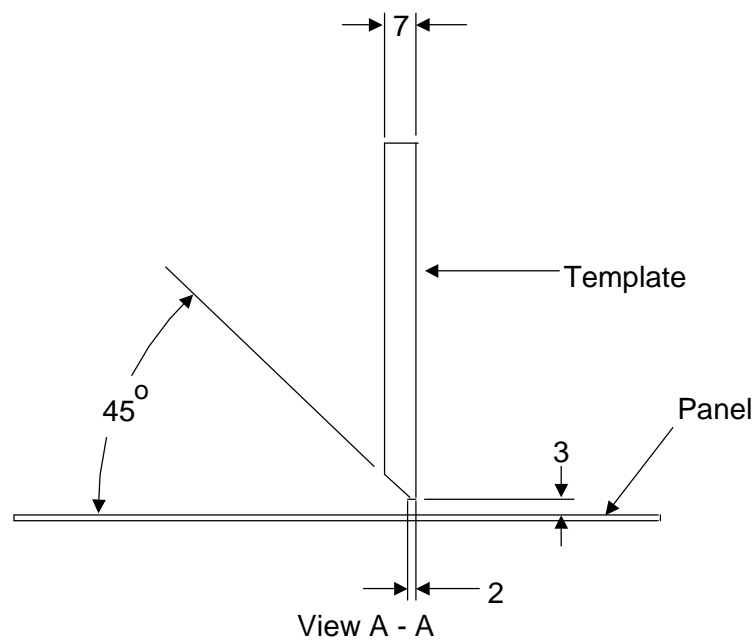
All templates and additional details to be Metric standard.

All templates must have 45 degree chamfer (see sketch).

Wolverine Bronze or equivalent quality template drop assembly required.



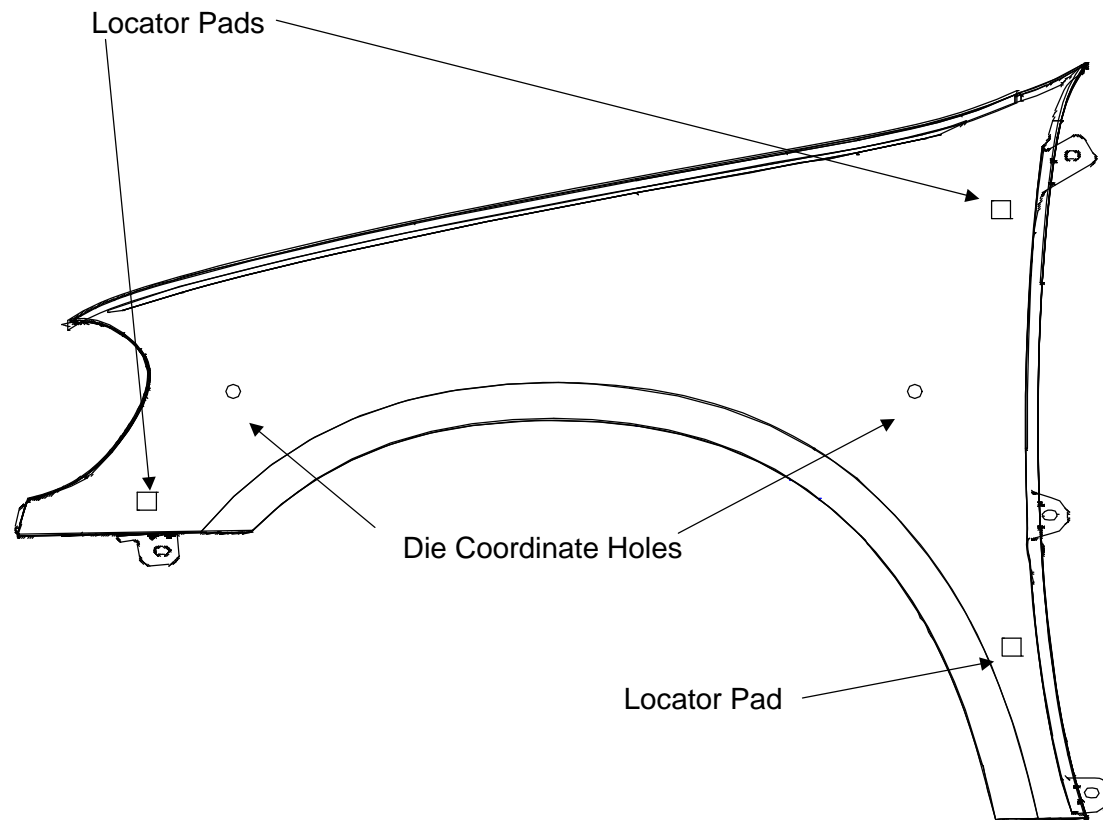
Reference dimensions for template construction



Die Development Locators

Fixture build companies may be requested to add die development locators to the checking fixture.

These locators are used by OAC's die suppliers to develop dies and to measure variation between die processes during die tryout.



Die development locators may consist of 3 or more 25mm by 25mm locator pads on the bottom of the draw surface.

There will also be two die coordinate holes to locate the panel in the secondary and tertiary axis.

OGIHARA AMERICA CORPORATION CHECK FIXTURE SET UP INSTRUCTIONS

CUSTOMER:

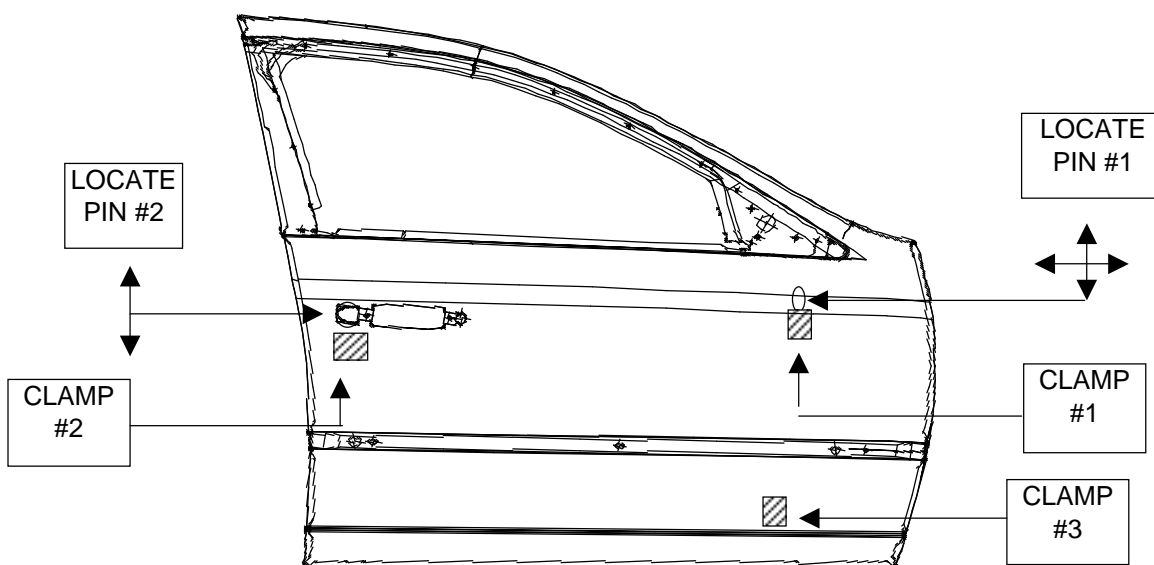
FORD WIXOM

PART NAME:

DEW (98) RH FRT DR ASSY

PART NUMBER:

XW43-5420124



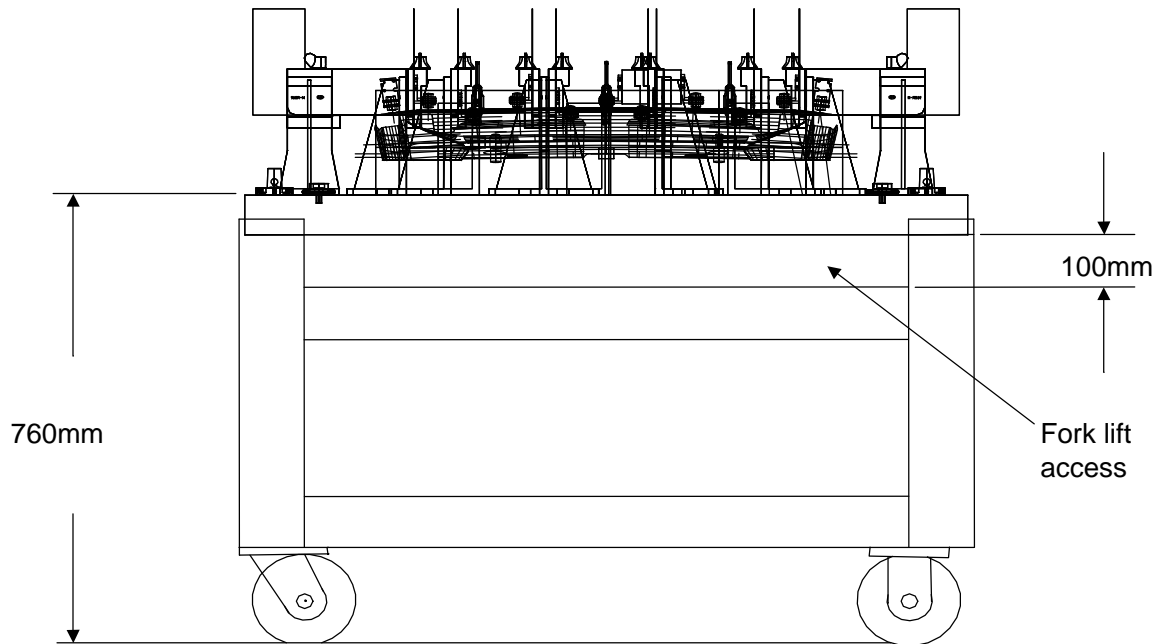
- 1.) LOAD PART ON TO LOCATOR PINS #1 AND 2.
- 2.) GO TO THE BACK OF THE FIXTURE AND SET CLAMPS 1,2 & 3.
THE #4 CLAMP IS USED FOR INNER SUB ASSY ONLY.
- 3.) SLIDE WINDOW DETAILS AND PIN THEM IN PLACE.
- 4.) PERFORM ALL SIGHT CHECKS.
- 5.) VERIFY ALL NETS WITH .10mm FEELER. RESET PART IF NECESSARY. CONTACT FACILATOR IF PROBLEM CONTINUES.
- 6.) COMPLETE ALL LEVEL 4 POINTS, REFER TO POINT & METHOD.

Ogihara Checking Fixture Tolerances

These tolerances are to be used in the construction and certification of stamping/assembly checking fixtures unless otherwise specified by Ogihara America Corporation - Quality Tooling department.

1. CMM starts to machined edge of base = $\pm 0.125\text{mm}$
2. Surface locators to CMM starts = $\pm 0.05\text{mm}$ controlling direction.
3. Locators to CMM starts = $\pm 0.2\text{mm}$ non-controlling direction.
4. Positional tolerance of pin locator to CMM starts = $\pm 0.05\text{mm}$.
5. Nominal pin diameter is to be M.M.C. of hole design as toleranced.
6. Pin diameter tolerance is $\pm 0.0127\text{mm}$.
7. Check rails profile to CMM starts = $\pm 0.15\text{mm}$.
8. (4) way (H) locator pin to - (2) way (H) locator pin relationship = $\pm 0.05\text{mm}$ controlling direction.
9. (4) way (H) locator pin - (2) way (H) locator pin relationship = $\pm 0.1\text{mm}$ non-controlling direction.
10. Template (flipper details) surface profile = $\pm 0.15\text{mm}$.
11. Probe bushing for Data Myte measuring points from CMM starts $\pm 0.20\text{mm}$ non-controlling direction.
12. Probe bushing for Data Myte measuring points from CMM starts $\pm 0.10\text{mm}$ controlling direction.
13. Base must have a flat and parallel to $\pm 0.10\text{mm}$.
14. Base must be level to 0.125 total overall tolerance.
15. Generic holding fixture - columns machined flatness and parallel hole to hold = $\pm 0.05\text{mm}$.
16. Generic holding fixture - columns square to base within 0.075mm.
17. Master Body Gage (Blue Buck) overall tolerance from front to back = $\pm 0.13\text{mm}$ all directions.
18. Master Body Gage locating pin relationships, pin to pin = $\pm 0.13\text{mm}$ all directions.
19. Check rail flush, check trim line 90 degrees to surface of metal when angle is over 7 degrees.
20. Check rail flush, check trim line to surface of base when angle is under 7 degrees.

The production detail stamping fixture must be at the proper work height for the user. A cart is not mandatory on all fixtures. Quote line up will specify cart requirements.



To be completed by Fixture Manufacturer prior to OAC buy-off

Date: _____

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Checking Fixture Engineer:	
Build Source:	

	Fixture Construction Checklist	Ok	Reject	Approved By
1	Approved Design signed off by OAC Representative.			
2	Latest E.C incorporated & stamped on tag.			
3	Fixture built to design.			
4	Fixture built to OAC standards.			
5	Templates operational.			
6	Locking pins operational.			
7	Flush checks identified.			
8	Feeler checks identified (3mm).			
9	Sight checks.			
10	Probe / SPC checks operational.			
11	Clamps (90 deg., numbered, operational).			
12	Locators / Locating scheme (OAC approved)			
13	Measuring points identified to customer specs. (OAC approved)			
14	Fixture built in body position (or 90 deg.)			
15	Body lines identified.			
16	Start points identified.			
17	Check rails.			
18	Hand applies.			
19	Plug checks / Keepers - Cables.			
20	Gage / Scribe pins (Fit to bushings).			
21	Proper paint scheme.			
22	Sequence of operations / Tags / Attached in clear view.			
23	Safety hoist rings / Eye bolts / Handling holes / Carts.			
24	Gage R&R.			
25	Fixture Certification.			
26	Electronic fixture design received.			

Comments/Concerns:

_____ Date: _____

OAC Quality Tooling Engineer

_____ Date: _____

OAC Engineer

_____ Date: _____

Manufacturing Source: _____

- 1.0 RFS locating pins are not permissible under any condition. MMC pins only.
- 2.0 Stamp actual start dimensions in three planes and identify with "mm" symbol.
- 3.0 Stamp or identify the amount of feeler clearance between part and checking surface, (to be visible when part is in fixture) and identify with "mm"
- 4.0 Stamp or identify surfaces used for flush checking with the word "Flush".
- 5.0 Stamp the following information on identification plate: fixture number, part number, that the fixture also checks. Actual weight, part name, engineering level, construction source and inspectors identification.
- 6.0 Break all sharp corners.
- 7.0 Construction balls remain with fixtures and be covered with protective caps.
- 8.0 Set-up lines and line block location must be identified.
- 9.0 Clamps, Hinges, Flippers, Plugs, and Slides must be in working condition and free of play. This applies to commercial and non-commercial details.
- 10.0 Deviations from tool drawing must be in writing and approved by plant manufacturing engineering and checking fixture design section (staff).
- 11.0 Use dowels and socket head cap screws unless otherwise shown.
- 12.0 All fixture hardware and fasteners must be Metric standard.
- 13.0 Interchangeable details are to be mounted on fixture unless shown otherwise. Non-Mounted units must be mounted units must be shipped in same crate as fixture.
- 14.0 All Non-gaging surfaces are to be painted with specified enamel and metal checking surfaces must be black surfaces must be oxidized. Observe all color code specification identified at line up and according to this standard manual.

CHECKING FIXTURE SPECIFICATIONS

ASSEMBLY CHECKING FIXTURES

- | | |
|---|--|
| <p>15.0 Rest Area
Master Control Surface
Detail Panel C/F Inspection Surf.
Steel Assembly Checking Fixtures</p> | <p>Bright Yellow
Bright Orange
Gray, with Black Sight Check Features
The Same Color as the Project Dies & Assembly Equipment</p> |
|---|--|
- 16.0 It is the supplier's responsibility to understand all customer locating drawings. Example: Ford Ideas, Metaphase system.
- 17.0 All gages will be designed with the clamps and nets independent of the checking fixture form rail.
- 18.0 All checking fixtures will have the identification plate mounted in an accessible area while the panel is in the gage.
- 19.0 Full flush and feeler rails around all panels and assemblies unless otherwise specified.
- 20.0 All checking fixtures must have operation instructions which include a picture of the panel. This instruction sheet must be in an accessible area while the panel is in the gage.
- 21.0 All gage designs require design buy off by an Ogihara quality systems representative. If the gage manufacturer builds the gage without Ogihara approval, the supplier assumes all responsibilities that may occur if the gage is not built to OAC specifications.
- 22.0 All checking fixtures must have measuring points (SPC) labeled to customer specifications and nomenclature.

- 1.0 The supplier must verify the gage will comply with the part geometric dimensioning and tolerancing.
- 2.0 The supplier must verify the gage will comply with all part measuring specifications.
- 3.0 The supplier is responsible to make sure that all tooling was built to design and that the data required for inspection matches. Also, all dimensional inspection reports prepared by the supplier should have sufficient check points to substantiate vendor certification.
- 4.0 Dimensional inspection reports are required on all checking fixtures, unless otherwise indicated on the purchase order. All data is to show part numbers and indicate R.H. or L.H. data for each unit and detail.
- 5.0 Specific construction and inspection data required will also be shown on each fixture or gage design.
- 6.0 Establish whether checking fixtures, etc. should be sourced inspected or shipped to OAC for inspection. If the checking fixtures are rejected from OAC inspection, they will be returned to the supplier at the supplier's expense.
- 7.0 On any new dimensional reports prepared, all new data should accompany the fixture.
- 8.0 On all approved checking fixtures, place all inspection data and forms in an envelope and place in a shipping container along with one set of prints. This is applicable to fixtures shipped to stamping plants and purchased part suppliers who supply parts to OAC only. Copies of forms applicable and dimensional inspection data must be retained for future reference.

- 1.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 2.0 The checking fixture design must clearly identify all master control holes & surfaces.
- 3.0 The checking fixture design must clearly identify all measuring point features.
- 4.0 The gage design must include the most updated part outline.
- 5.0 Completed CAD designs are to include all rail surface data, as well as structure. All revisions and / or engineering changes that affect require the same.
- 6.0 The design intent should include specific gage requirements including written descriptions.
- 7.0 The design must consider the environment in which the gage is to be used when choosing material, pins, clamps, etc., and ensure that they will remain functional throughout the life of the gage.
- 8.0 All check surfaces must be clearly identified using a separate color.
- 9.0 OAC Customer design reviews will be conducted at concept, 50%, and 90% prior to design buyoff.
- 10.0 OAC requires a sequence of operations "sign off".
- 11.0 (1) Key sheet required per set of designs.
- 12.0 Ogihara CUSTOMER standard title block required on all design sets.
- 13.0 The supplier may utilize any of the following media types: CD ROM. Suppliers may also directly connect via phone lines, Win 95, NT 4.0, or above are required.

- 1.0 CAD data, Part prints, Die models, Master templates, Mylar prints, and / or Numerical Control tapes are to be used in the design of checking fixtures.
- 2.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 3.0 The checking fixture design must clearly identify all master control holes & surfaces.
- 4.0 The checking fixture design must clearly identify all measuring point features.
- 5.0 The gage design must include the most updated part outline.
- 6.0 The design intent should include specific gage requirements including written descriptions.
- 7.0 The design must consider the environment in which the gage is to be used when choosing material, pins, clamps, etc., and ensure that they will remain functional throughout the life of the gage.
- 8.0 All check surfaces & locators must be clearly identified.
- 9.0 OAC Customer design reviews will be conducted at concept, 50%, and 90% prior to design buyoff.
- 10.0 OAC requires a sequence of operations "sign-off".
- 11.0 (1) Key sheet is required per set of designs.
- 12.0 Ogihara CUSTOMER standard title block is required on all design sets.
- 13.0 All drawings must be full sized & accurate representations of the dimensions shown. Out of scale dimensions are not permitted.
- 14.0 Original designs must be drawn or plotted on Mylar.

To be completed by Fixture Designer prior to OAC buy-off

Date: _____

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Checking Fixture Engineer:	
Design Source:	Build Source:

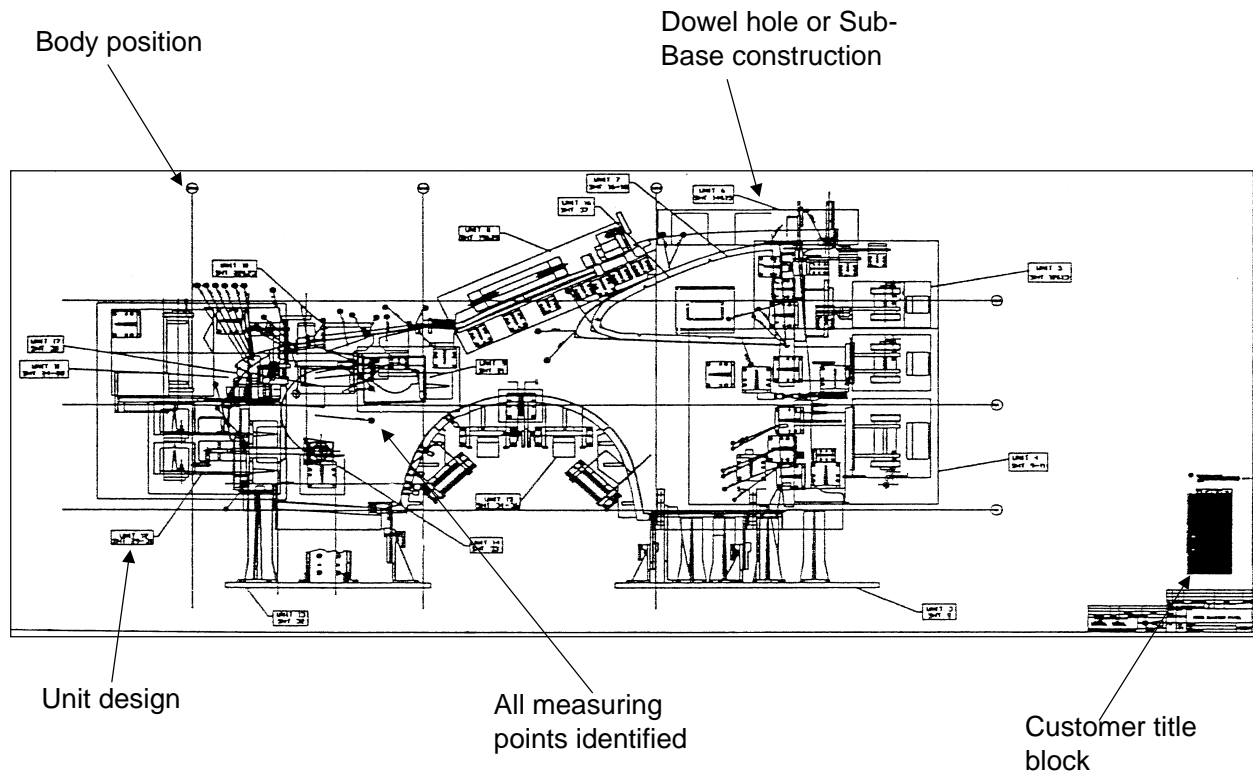
	Fixture Design Checklist	Ok	Reject	Approved By
1	Design reflects proper part number and E.C. levels.			
2	Locators conform to customer GD&T.			
3	Locations of datums are identified.			
4	All measuring points are incorporated into design according to customer specifications.			
5	All coordinates for measuring points are listed on prints.			
6	All clamp pivot points are in line with pressure points.			
7	Adequate clearance is provided for part loading and unloading.			
8	All checking fixtures are practical and accessible.			
9	All swing and slide details are clear of other components.			
10	All swing and slide details fall within the confines of the base when they are in the opened position.			
11	All details and units are identified properly.			
12	Provisions have been made for handling.			
13	Lift cables and chains clear all fixture details.			
14	Overall size and weight has been reviewed for in plant use.			
15	Design addresses ergonomical and operational safety issues.			
16				
17				
18				
19				
20				
21				
22				
23				
26				

Comments/Concerns:

OAC Engineer _____ Date: _____

Manufacturing Source: _____ Date: _____

Design and Build Specifications



One key sheet per design set.

All units and measuring points identified on key sheet.

All assembly checking fixtures in body position unless specified otherwise.

Ogihara customer standard title block on all designs.

Measuring Points

Significant characteristics.

Indicates significant characteristics points.

Stamp arrow, level no. & numbers S-1 through S- 1/8 high & fill with white paint at locations noted. See sheet.

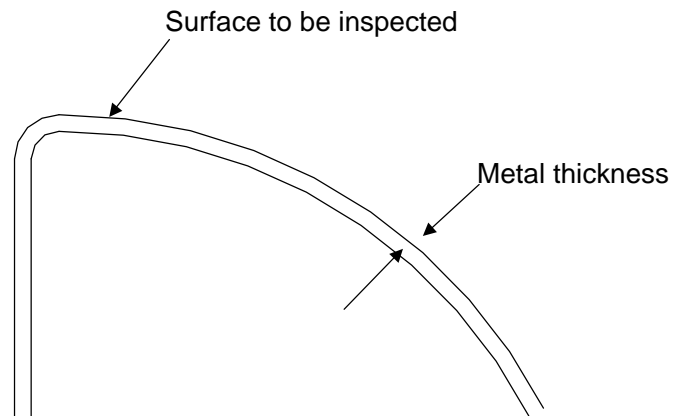
	POINT INDENT	COORDINATES		
		"X"	"Y"	"Z"
LEVEL 4	1			1200.00
LEVEL 4	2			900.00
LEVEL 4	3			1000.00
LEVEL 4	4			1000.00
LEVEL 4	5			700.00
LEVEL 4	6			700.00
LEVEL 4	7			475.00
LEVEL 4	8			475.00
LEVEL 4	9			475.00
LEVEL 4	10			545.00
LEVEL 4	11			545.00
LEVEL 4	12			650.00
LEVEL 4	13			650.00
LEVEL 4	43.0	3410.00		
LEVEL 4	44.0	3595.00		
LEVEL 4	45.0			1085.00
LEVEL 4	46.0			1085.00
LEVEL 4	47.0			1085.00
LEVEL 4	48.0	3700.00		
LEVEL 4	51.0	3950.00		
LEVEL 4	52.0	3950.00		
LEVEL 4	D3-1	4840.00	662.00	1093.27
LEVEL 4	D3-2	4840.00	657.56	1090.00
LEVEL 4	C10-2	4925.00	590.00	1045.31
LEVEL 4	D6-1	5000.00	682.00	1064.56
LEVEL 4	D6-2	5000.00	677.00	1062.00
LEVEL 4	D18-2	5060.00	624.42	1038.00
LEVEL 4	C8-1	5135.00	639.00	1005.82

Identify all measuring points according to customer specified format

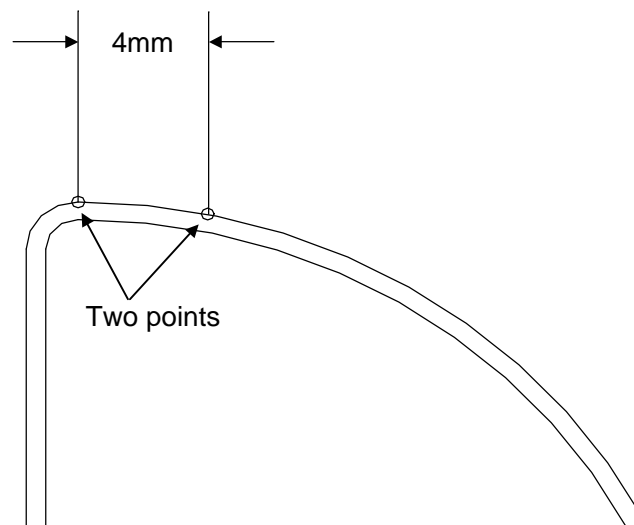
OAC Checking Fixture Rail Buy-Off Requirements

The Assembly Checking Fixture rails will be inspected to product in the following manner:

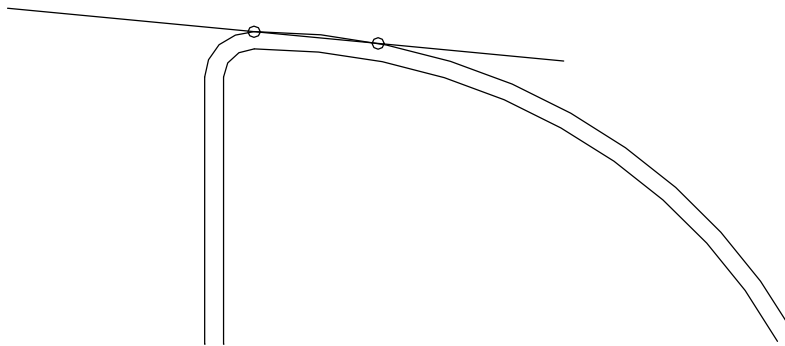
- 1) Cut a cross section of the panel and offset metal thickness if required



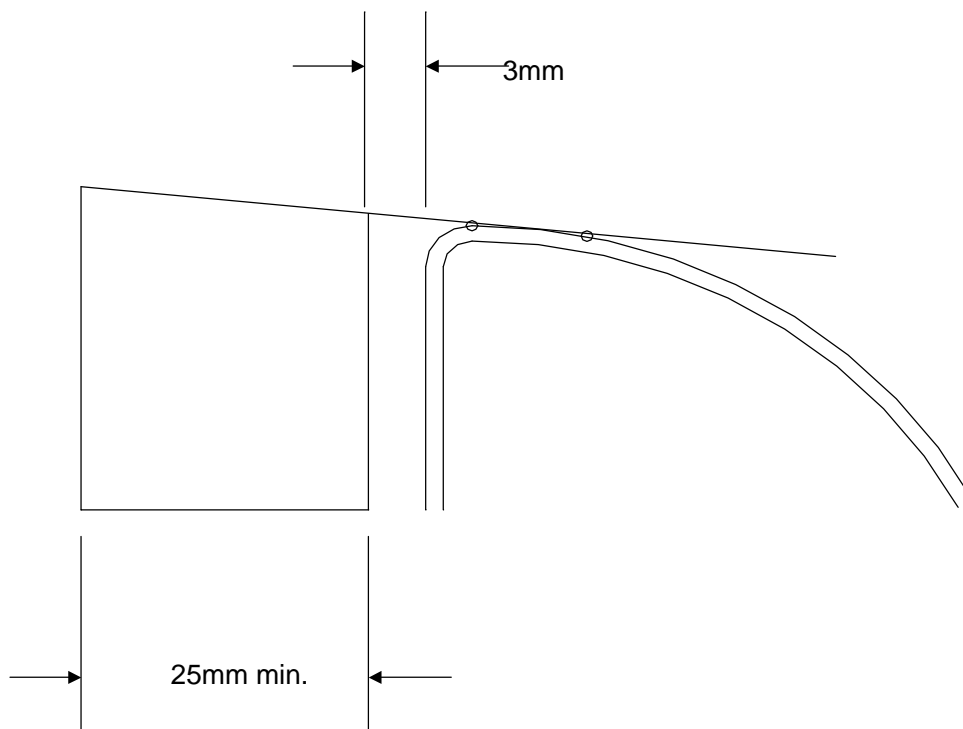
- 2) Pick two points on the surface to be inspected. One point on the tangent of the radius, and one point 4mm in front of the tangent.



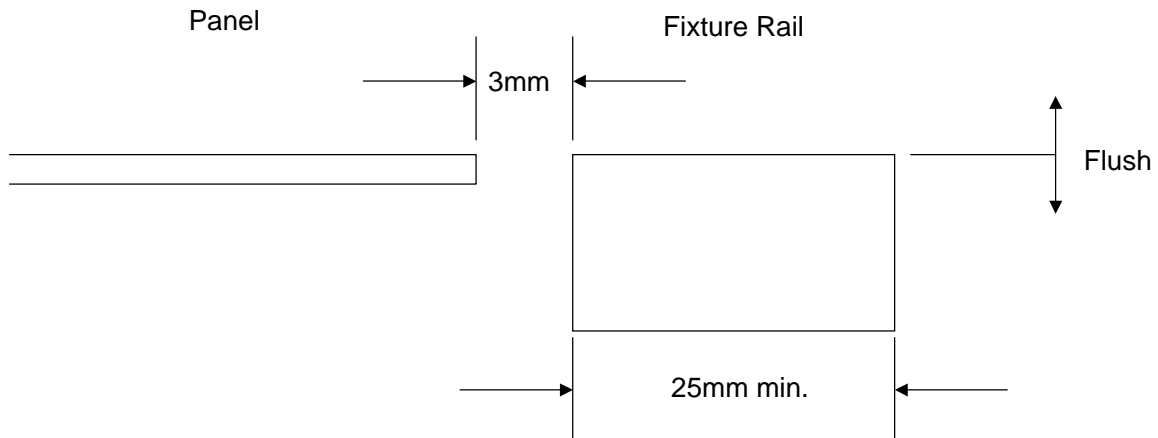
- 3) Create a straight line through the center of the two points



- 4) To create the margin surface, parallel offset 3mm from the inspected surface. The margin check must be a minimum of 25mm if possible.



Construction Features of Checking Fixtures

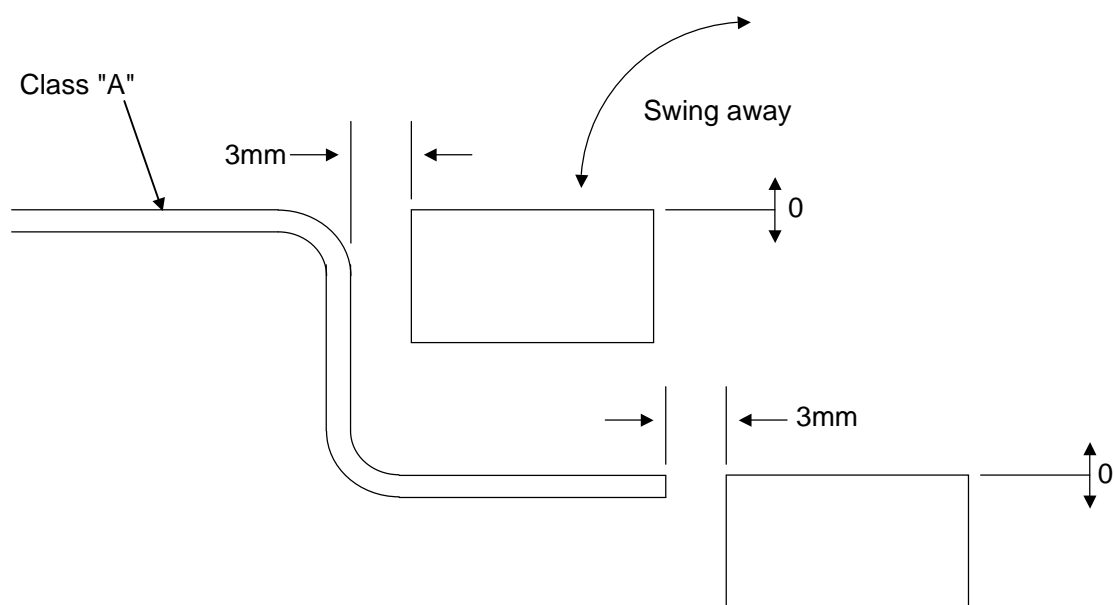


On all flange check rails, Ogihara requires the rail to be flush to the flange surface and 3mm from the trim edge. This allows Ogihara inspectors to collect variable data from the trim edge using a transducer detail if required.

Any deviation from the above specification, due to product limitations, must have Ogihara approval.

All check rails 25mm or greater in size.

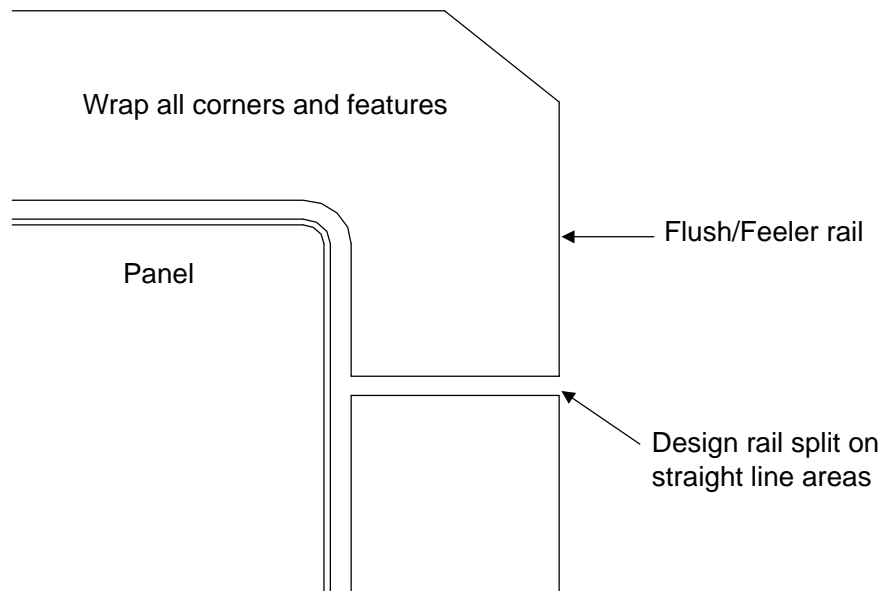
All surfaces certified to O.S.M. condition, unless specified otherwise.



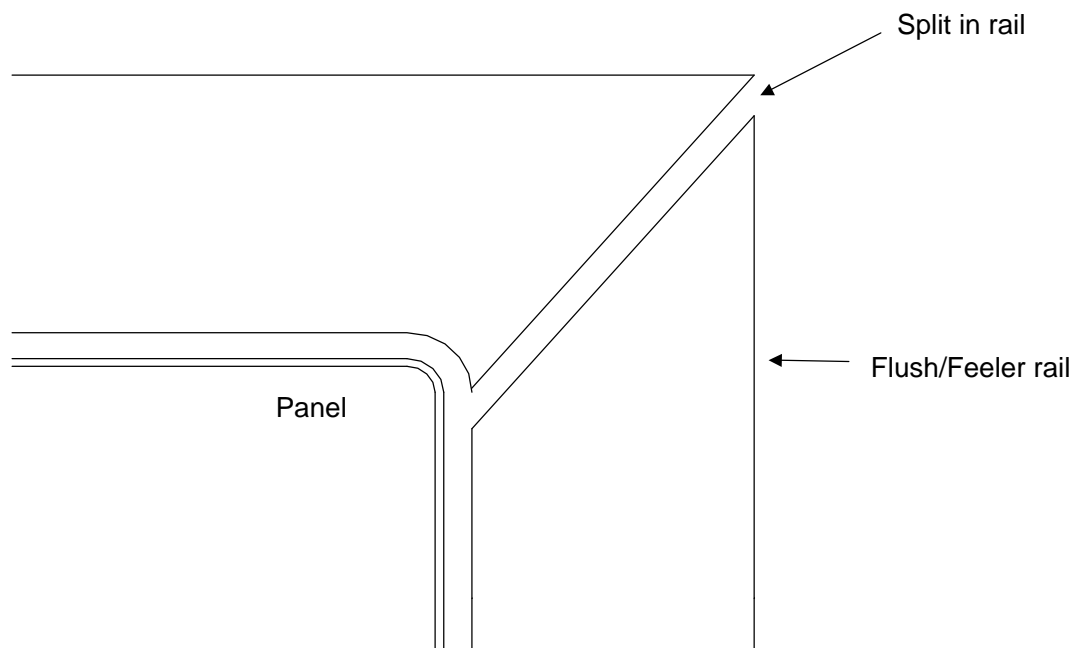
Measure all Class "A" hard lines and features. If the weld flange requires data collection at the same cross section, design the class "A" detail so that it will move away from the hard line. This will allow the inspector to collect data from the weld flange.

Fixture Rail Design

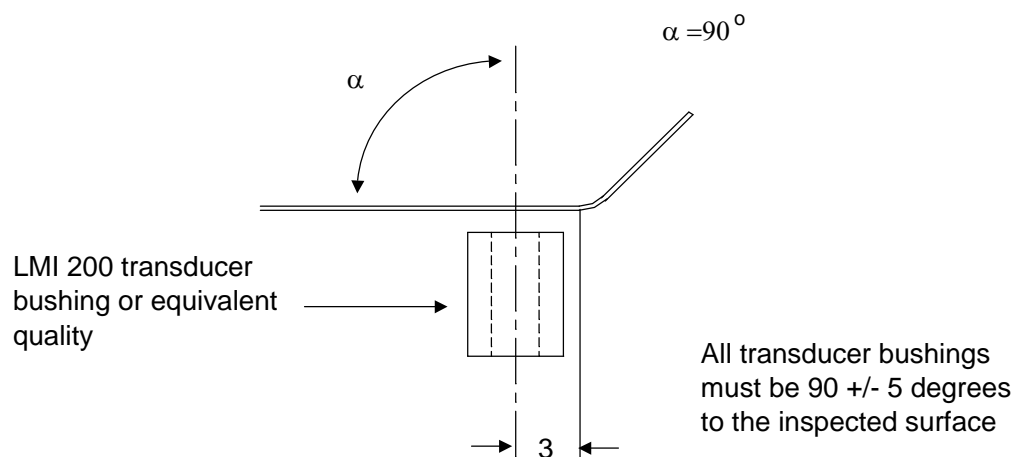
Correct Design



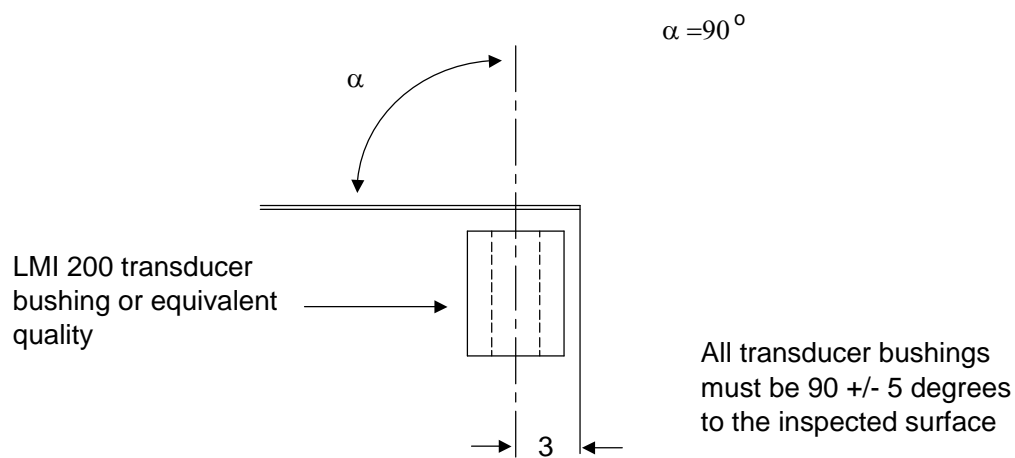
Incorrect Design



Transducer Standards for Assembly Checking Fixture Construction



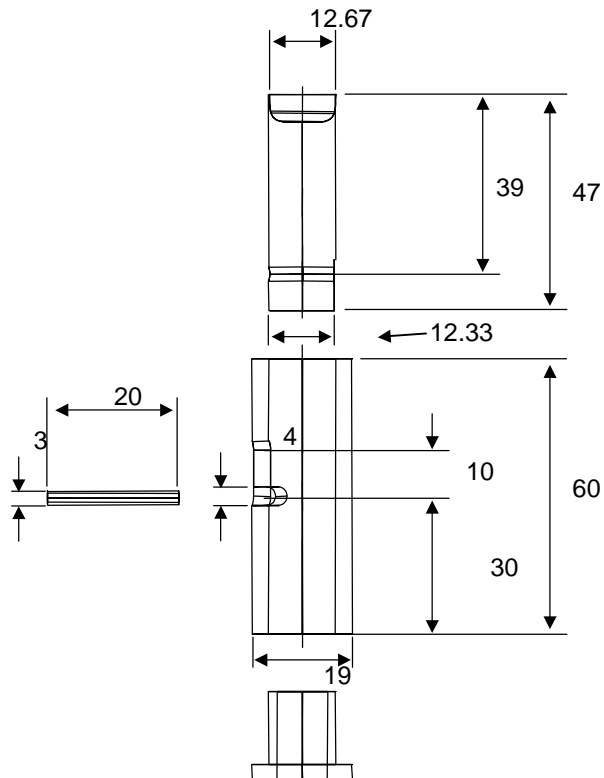
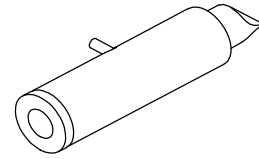
All surface measuring points must be 3 mm from the tangent of the radius, unless otherwise specified by Ogihara Engineer or customer documentation.



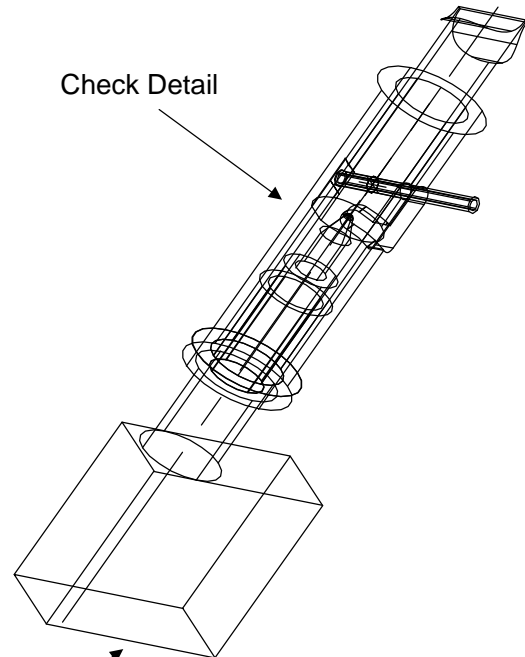
All surface measuring points must be 3 mm from the trim edge, unless otherwise specified by Ogihara Engineer or customer documentation.

Ogihara standard trim and hem edge check detail.

Use on all Detail and Assembly Checking
Fixture trim and hem edge measuring points.



Check Detail

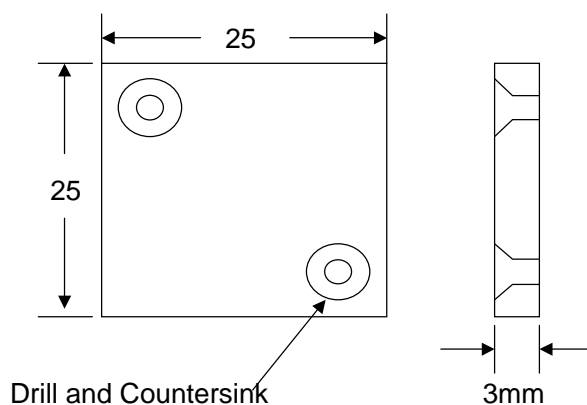


LMI-200 Transducer Probe

Locator Net Pads

For all checking fixtures, all locator pads will be 25mm by 25mm square, unless specified by customer requirements and/or location restrictions. The pads must be hardened and ground to 3mm thick, unless otherwise specified.

In complex areas, locator pads must be N.C. cut to accommodate product surface.



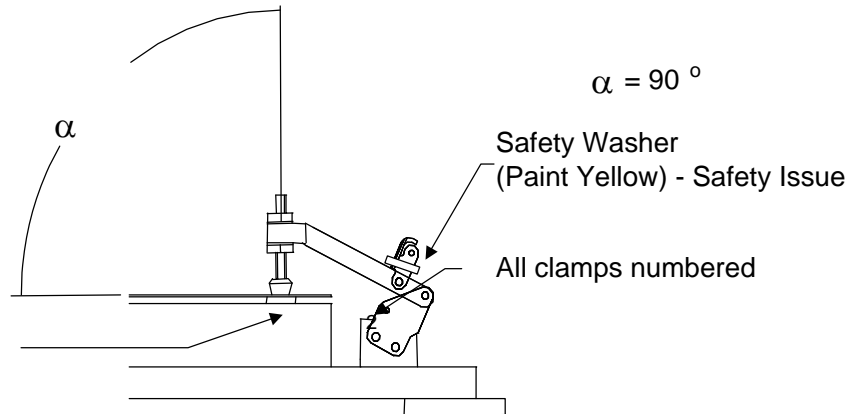
Assembly checking fixtures which hold detail stampings must incorporate hardened steel locator pads for the assembly, and brass locator pads for the detail stamping. The brass locator pads must be identified and in a storage unit when not in use.

Clamping Specifications

Design all clamps 90 degrees to product.

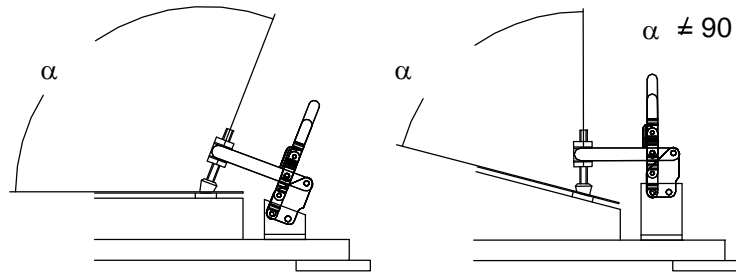
Acceptable

Maximum 5 lbs.
Clamping Pressure



Not Acceptable

1)



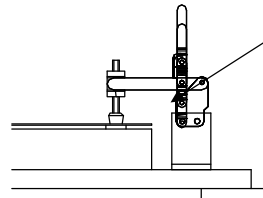
2)



Rubber pad ground on an angle.

3)

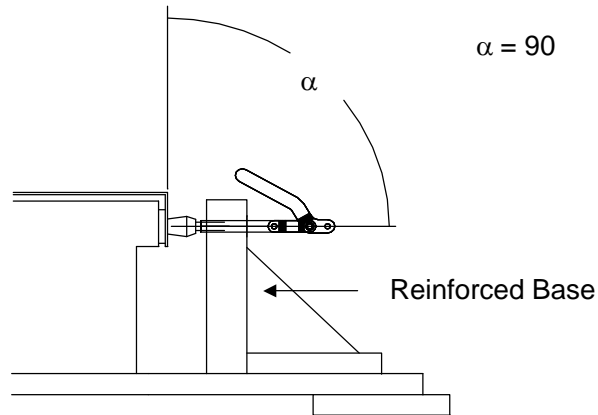
Missing identification number



Clamping Specifications

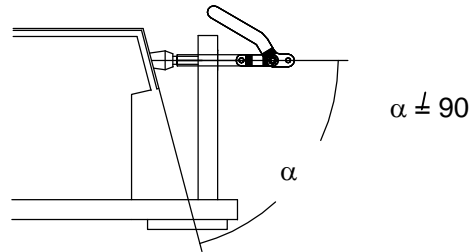
Design all clamps 90 degrees to product.

Acceptable

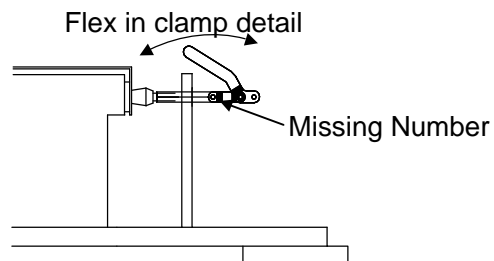


Not Acceptable

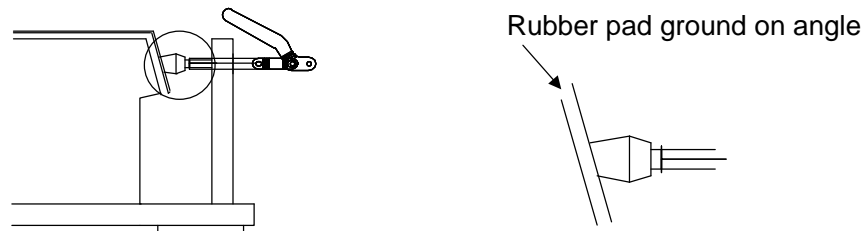
1)



2)



3)



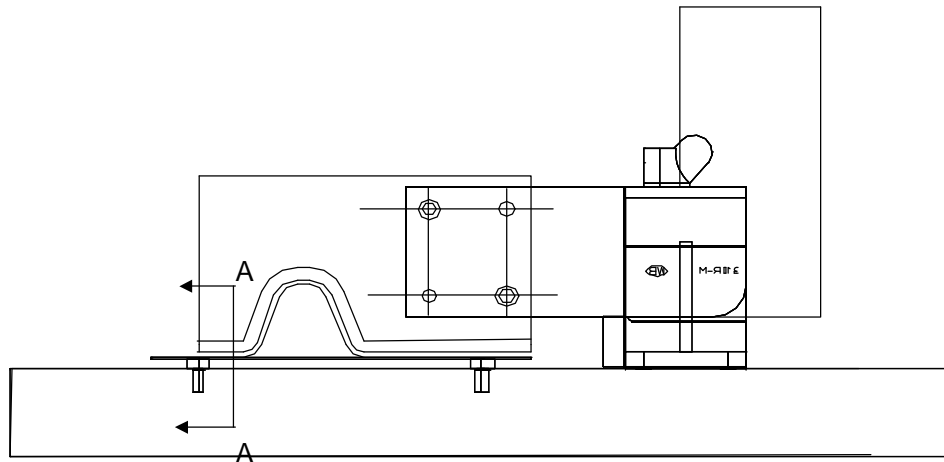
Template Drop Assembly Reference Information

All template construction to be free of movement when locked in position.

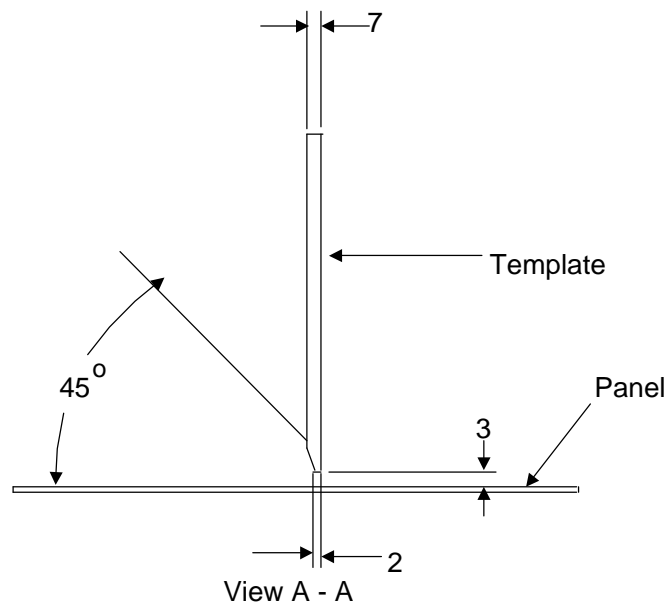
All templates and additional details to be Metric standard.

All templates must have 45 degree chamfer (see sketch).

Wolverine Bronze or equivalent quality template drop assembly required.



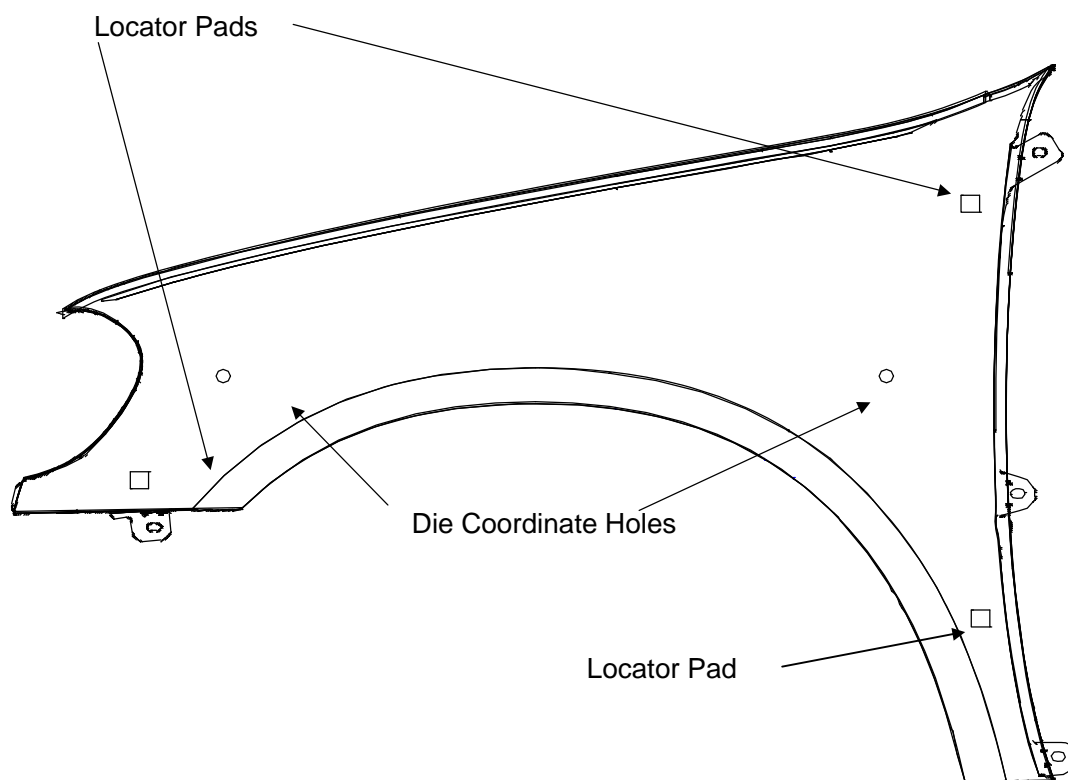
Reference dimensions for template construction



Die Development Locators

Fixture build companies may be requested to add die development locators to the checking fixture.

These locators are used by OAC's die suppliers to develop dies and to measure variation between die processes during die tryout.



Die development locators may consist of 3 or more 25mm by 25mm locator pads on the bottom of the draw surface.

There will also be two die coordinate holes to locate the panel in the secondary and tertiary axis.

OGIHARA AMERICA CORPORATION CHECK FIXTURE SET UP INSTRUCTIONS

CUSTOMER:

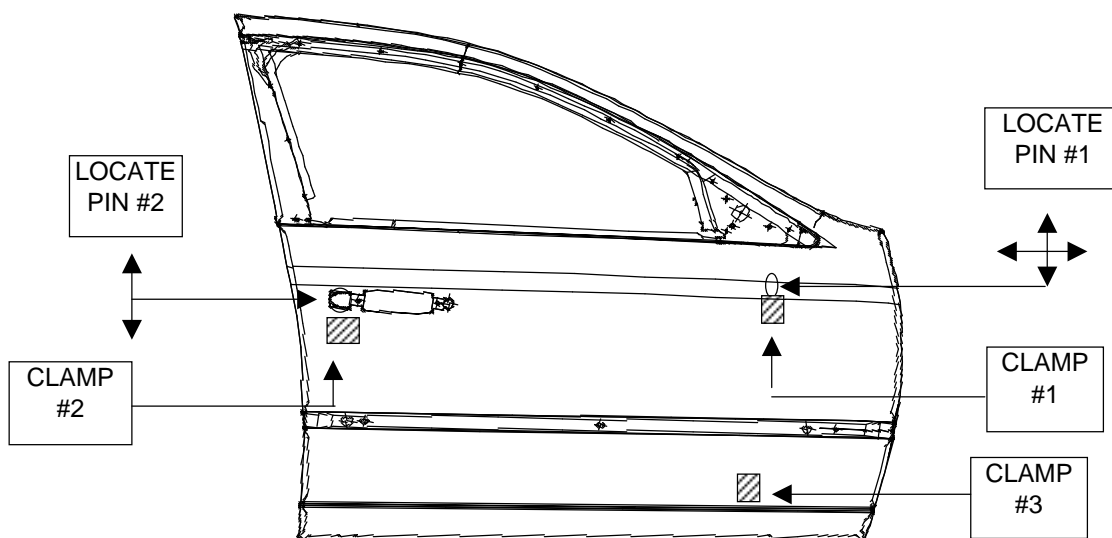
FORD WIXOM

PART NAME:

DEW (98) RH FRT DR ASSY

PART NUMBER:

XW43-5420124



- 1.) LOAD PART ON TO LOCATOR PINS #1 AND 2.
- 2.) GO TO THE BACK OF THE FIXTURE AND SET CLAMPS 1,2 & 3.
THE #4 CLAMP IS USED FOR INNER SUB ASSY ONLY.
- 3.) SLIDE WINDOW DETAILS AND PIN THEM IN PLACE.
- 4.) PERFORM ALL SIGHT CHECKS.
- 5.) VERIFY ALL NETS WITH .10mm FEELER. RESET PART IF NECESSARY. CONTACT FACILATOR IF PROBLEM CONTINUES.
- 6.) COMPLETE ALL LEVEL 4 POINTS, REFER TO POINT & METHOD.

4.2.P1.M1

To be completed by the Fixture Manufacturer prior to OAC buy-off

Part Name:		Part Number:	
Tool Number:		Part At E.C. Level:	
Fixture At Engineering Level:			
Checking Fixture Engineer:			
Build Source:			
	Fixture Construction Checklist	Ok	Reject
Approved By			
1	Approved Design signed off by OAC Representative.		
2	Functional Gauge Plan Approval Request form signed.		
3	Latest E.C incorporated & stamped on tag.		
4	Fixture built to design.		
5	Fixture built to OAC standards.		
6	Templates operational.		
7	Locking pins operational.		
8	Flush checks identified.		
9	Feeler checks identified (3mm).		
10	Sight checks.		
11	Probe / SPC checks operational.		
12	Clamps (90 deg., numbered, operational).		
13	Locators / Locating scheme (OAC approved)		
14	Measuring points identified to customer specs. (OAC approved)		
15	Fixture built in body position (or 90 deg.)		
16	Body lines identified.		
17	Start points identified.		
18	Check rails.		
19	Hand applies.		
20	Plug checks / Keepers - Cables.		
21	Gage / Scribe pins (Fit to bushings).		
22	Proper paint scheme.		
23	Sequence of operations / Tags / Attached in clear view.		
24	Safety hoist rings / Eye bolts / Handling holes / Carts.		
25	Gage R&R.		
26	Fixture Certification.		
27	Copy of Fixture Design received.		

Comments/Concerns:

OAC Checking Fixture Engineer

Date:

OAC Quality Systems Engineer

Date:

Manufacturing Source:

Date:

Customer approval:

Date:

- 1.0 RFS locating pins are not permissible under any condition. MMC pins only.
- 2.0 Stamp actual start dimensions in three planes and identify with "mm" symbol.
- 3.0 Stamp or identify the amount of feeler clearance between part and checking surface, (to be visible when part is in fixture) and identify with "mm" symbol.
- 4.0 Stamp or identify surfaces used for flush checking with the word "Flush".
- 5.0 Stamp the following information on identification plate: Fixture number, Part number, Part number that the fixture also checks, Actual weight, Part name, Engineering level, Construction source, and Inspectors identification.
- 6.0 Break all sharp corners.
- 7.0 Construction balls remain with fixtures and be covered with protective caps.
- 8.0 Set-up lines and line block location must be identified.
- 9.0 Clamps, Hinges, Flippers, Plugs, and Slides must be in working condition and free of play. This applies to commercial and non-commercial details.
- 10.0 Deviations from tool drawing must be in writing and approved by plant manufacturing engineering and checking fixture design section (staff).
- 11.0 Use dowels and socket head cap screws unless otherwise shown.
- 12.0 All fixture hardware and fasteners must be Metric standard.
- 13.0 Interchangeable details are to be mounted on fixture unless shown otherwise. Non-Mounted units must be shipped in same crate as fixture.
- 14.0 All Non-gaging surfaces are to be painted with specified enamel and metal checking surfaces must be black oxide. Observe all color code specifications identified at line up and according to this standard manual.

- 15.0 Checking fixture color specifications:
- | | |
|-----------------------------------|---|
| Rest Area | Bright yellow |
| Master Control Surface | Bright orange |
| Detail Panel C/F inspection surf. | Gray, with black sight check features |
| Steel assembly checking fixtures | The same color as the project dies and assembly equipment |
- 16.0 It is the supplier's responsibility to understand all customer locating drawings. Example: Ford Ideas, Metaphase system.
- 17.0 All gages will be designed with the clamps and nets independent of the checking fixture form rail.
- 18.0 All checking fixtures will have the identification plate mounted in an accessible area while the panel is in the gage.
- 19.0 Full flush and feeler rails around all panels and assemblies unless otherwise specified.
- 20.0 All checking fixtures must have operation instructions which include a picture of the panel. This instruction sheet must be in an accessible area while the panel is in the gage.
- 21.0 All gage designs require design buy off by an Ogihara quality systems representative. If the gage manufacturer builds the gage without Ogihara approval, the supplier assumes all responsibilities that may occur if the gage is not built to OAC specifications.
- 22.0 All checking fixtures must have measuring points (SPC) labeled to customer specifications and nomenclature.

- 1.0 The supplier must verify the gage will comply with the part geometric dimensioning and tolerancing.
- 2.0 The supplier must verify the gage will comply with all part measuring specifications.
- 3.0 The supplier is responsible to make sure that all tooling was built to design and that the data required for inspection matches. Also, all dimensional inspection reports prepared by the supplier should have sufficient check points to substantiate vendor certification.
- 4.0 Dimensional inspection reports are required on all checking fixtures, unless otherwise indicated on the purchase order. All data is to show part numbers and indicate R.H. or L.H. data for each unit and detail.
- 5.0 Specific construction and inspection data required will also be shown on each fixture or gage design.
- 6.0 Establish whether checking fixtures, etc. should be sourced inspected or shipped to OAC for inspection. If the checking fixtures are rejected from OAC inspection, they will be returned to the supplier at the supplier's expense.
- 7.0 On any new dimensional reports prepared, all new data should accompany the fixture.
- 8.0 On all approved checking fixtures, place all inspection data and forms in an envelope and place in a shipping container along with one set of prints. This is applicable to fixtures shipped to stamping plants and purchased part suppliers who supply parts to OAC only. Copies of forms applicable and dimensional inspection data must be retained for future reference.

- 1.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 2.0 The checking fixture design must clearly identify all master control holes & surfaces.
- 3.0 The checking fixture design must clearly identify all measuring point features.
- 4.0 The gage design must include the most updated part outline.
- 5.0 Completed CAD designs are to include all rail surface data, as well as structure. All revisions and / or engineering changes that affect require the same.
- 6.0 The design intent should include specific gage requirements including written descriptions.
- 7.0 The design must consider the environment in which the gage is to be used when choosing material, pins, clamps, etc., and ensure that they will remain functional throughout the life of the gage.
- 8.0 All check surfaces must be clearly identified using a separate color.
- 9.0 OAC Customer design reviews will be conducted at concept, 50%, and 90% prior to design buyoff.
- 10.0 OAC requires a sequence of operations "sign off".
- 11.0 (1) Key sheet required per set of designs.
- 12.0 Ogihara CUSTOMER standard title block required on all design sets.
- 13.0 The supplier may utilize any of the following media types: CD ROM. Suppliers may also directly connect via phone lines, Win 95, NT 4.0, or above are required.

- 1.0 CAD data, Part prints, Die models, Master templates, Mylar prints, and / or Numerical Control tapes are to be used in the design of checking fixtures.
- 2.0 Provide all necessary views, elevations, and cross sections to clearly show design intent.
- 3.0 The checking fixture design must clearly identify all master control holes & surfaces.
- 4.0 The checking fixture design must clearly identify all measuring point features.
- 5.0 The gage design must include the most updated part outline.
- 6.0 The design intent should include specific gage requirements including written descriptions.
- 7.0 The design must consider the environment in which the gage is to be used when choosing material, pins, clamps, etc., and ensure that they will remain functional throughout the life of the gage.
- 8.0 All check surfaces & locators must be clearly identified.
- 9.0 OAC Customer design reviews will be conducted at concept, 50%, and 90% prior to design buyoff.
- 10.0 OAC requires a sequence of operations "sign-off".
- 11.0 (1) Key sheet is required per set of designs.
- 12.0 Ogihara CUSTOMER standard title block is required on all design sets.
- 13.0 All drawings must be full sized & accurate representations of the dimensions shown. Out of scale dimensions are not permitted.
- 14.0 Original designs must be drawn or plotted on Mylar.

To be completed by Fixture Designer prior to OAC buy-off

Date: _____

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Checking Fixture Engineer:	
Design Source:	Build Source:

	Fixture Design Checklist	OK	Reject	Approved By
1	Design reflects proper part number and E.C. levels.			
2	Locators conform to customer GD&T.			
3	Locations of datums are identified.			
4	All measuring points are incorporated into design according to customer specifications.			
5	All coordinates for measuring points are listed on prints.			
6	All clamp pivot points are in line with pressure points.			
7	Adequate clearance is provided for part loading and unloading.			
8	All checking fixtures are practical and accessible.			
9	All swing and slide details are clear of other components.			
10	All swing and slide details fall within the confines of the base when they are in the opened position.			
11	All details and units are identified properly.			
12	Provisions have been made for handling.			
13	Lift cables and chains clear all fixture details.			
14	Overall size and weight has been reviewed for in plant use.			
15	Design addresses ergonomical and operational safety issues.			
16				
17				
18				
19				
20				
21				
22				
23				
26				

Comments/Concerns:

OAC Engineer

Date:

Manufacturing Source:

Date:

Fabricated upright (steel) to include machined base structure.

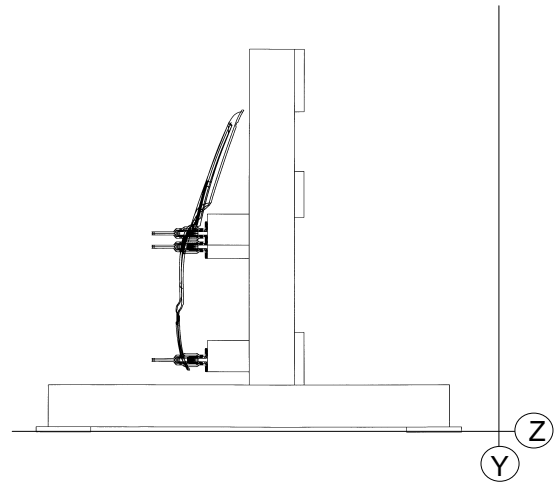
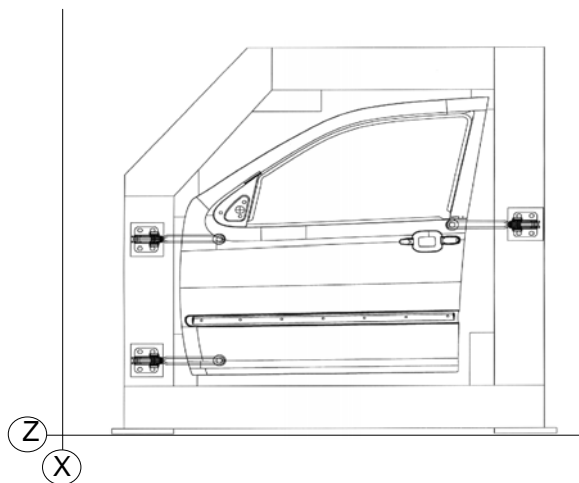
Add set up procedure and clamping sequence to fixture.

Certify Locators. Attach Ogihara buy off check list to include fixture ECN level identification plate.

Run gage R&R prior to using the gage.

Contact Ogihara Quality Systems associate for final buy off.

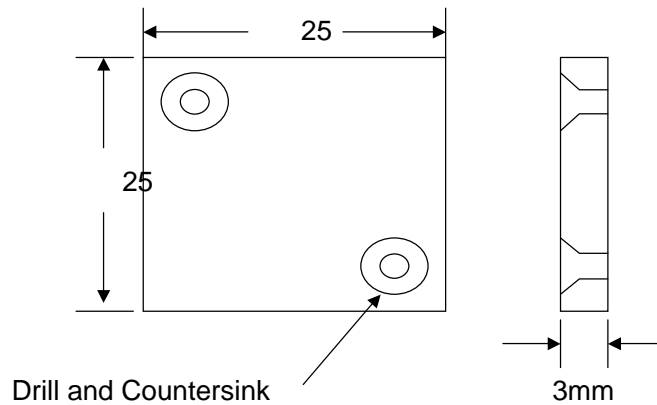
All shipping unit CMM Holding Fixtures in body position.



Locator Net Pads

For all checking fixtures, all locator pads will be 25mm by 25mm square. The pads must be hardened and ground to 3mm thick, unless otherwise specified.

In complex areas, locator pads must be N.C. cut to accommodate product surface.

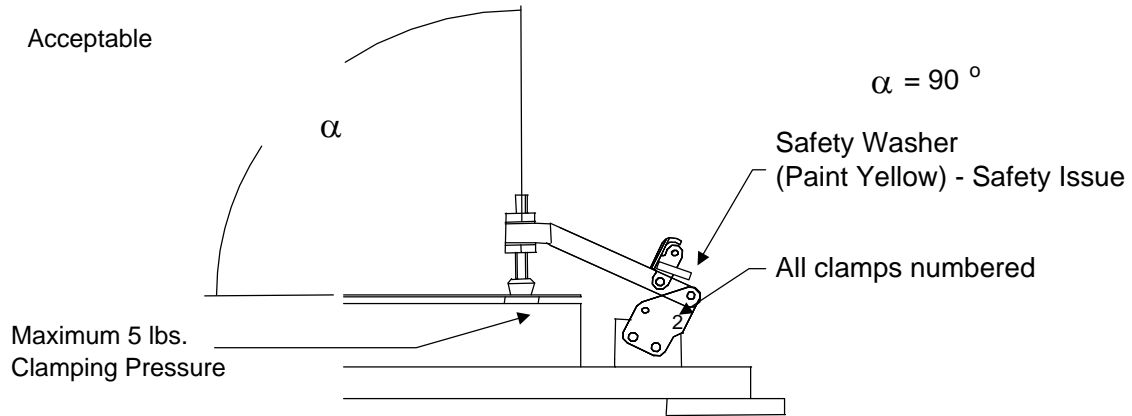


Assembly checking fixtures which hold detail stampings must incorporate hardened steel locator pads for the assembly, and brass locator pads for the detail stamping. The brass locator pads must be identified and in a storage unit when not in use.

Clamping Specifications

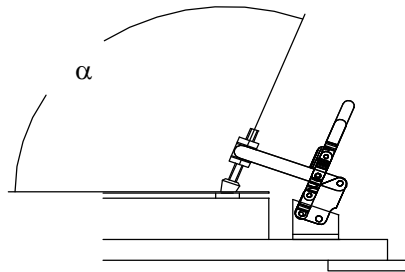
Design all clamps 90 degrees to product.

Acceptable

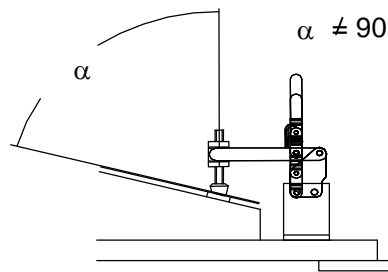


Not Acceptable

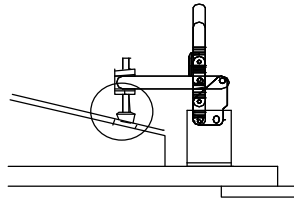
1)



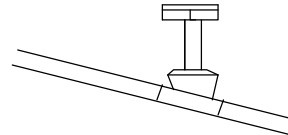
$\alpha \neq 90^\circ$



2)

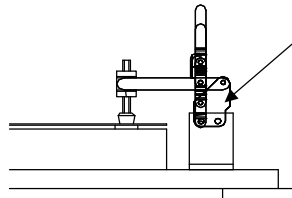


Rubber pad ground on an angle.



3)

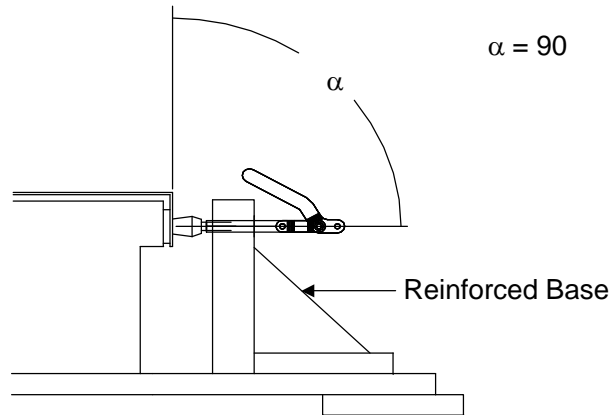
Missing identification number



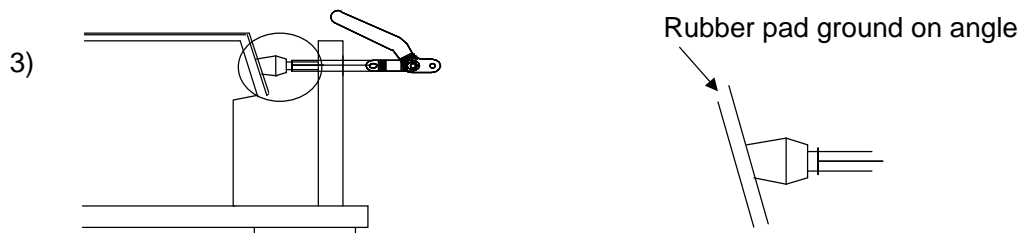
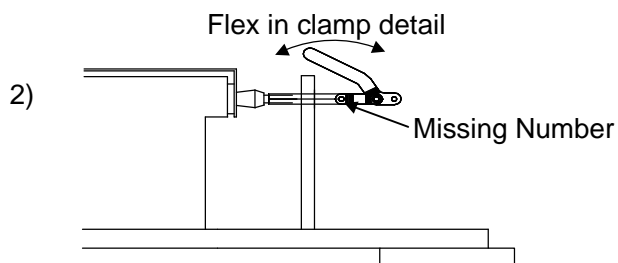
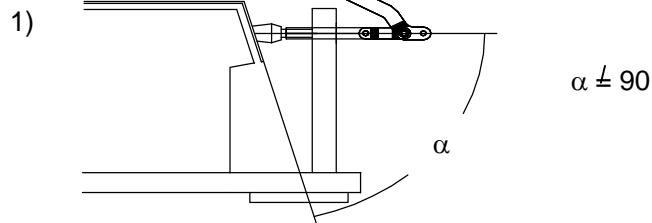
Clamping Specifications

Design all clamps 90 degrees to product.

Acceptable



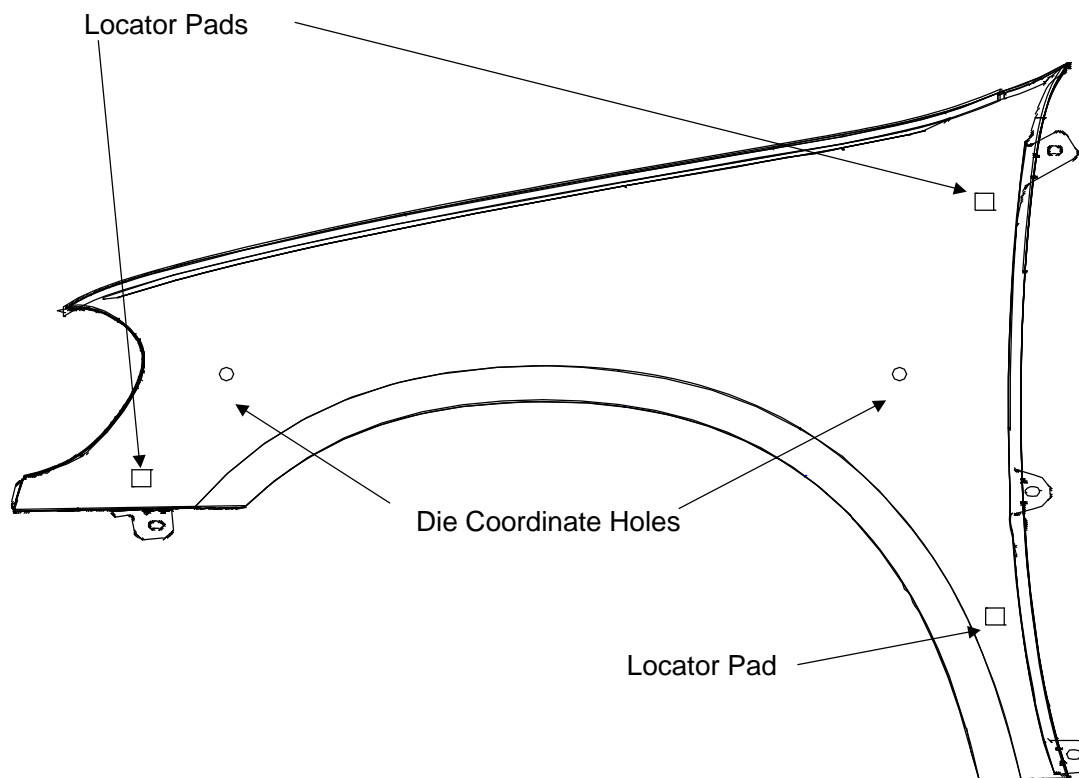
Not Acceptable



Die Development Locators

Fixture build companies may be requested to add die development locators to the checking fixture.

These locators are used by OAC's die suppliers to develop dies and to measure variation between die processes during die tryout.



Die development locators may consist of 3 or more 25mm by 25mm locator pads on the bottom of the draw surface.

There will also be two die coordinate holes to locate the panel in the secondary and tertiary axis.

OGIHARA AMERICA CORPORATION CHECK FIXTURE SET UP INSTRUCTIONS

CUSTOMER:

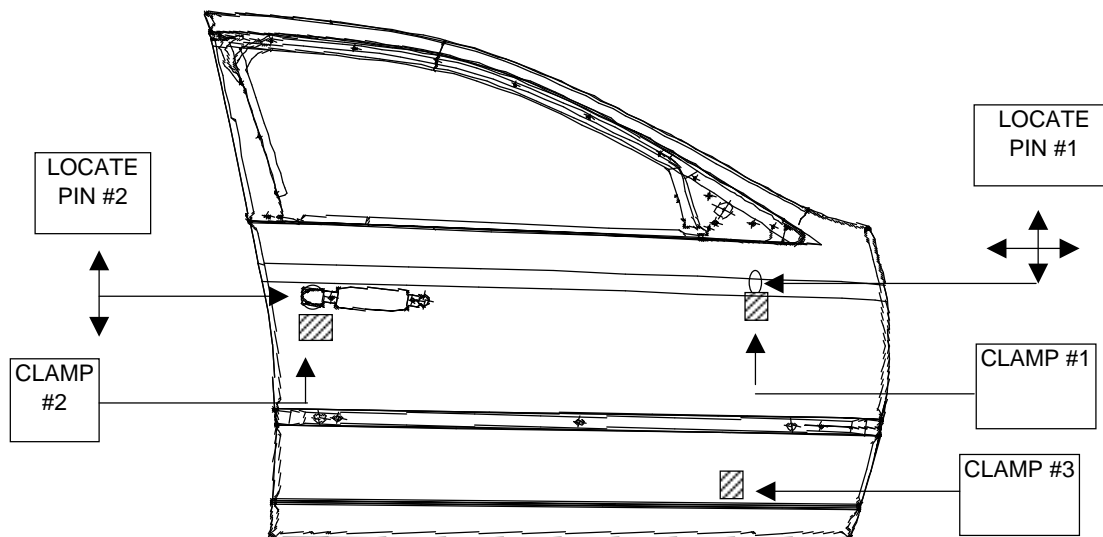
FORD WIXOM

PART NAME:

DEW (98) RH FRT DR ASSY

PART NUMBER:

XW43-5420124



- 1.) LOAD PART ON TO LOCATE PINS #1 AND 2.
- 2.) GO TO THE BACK OF THE FIXTURE AND SET CLAMPS 1,2 & 3.
THE #4 CLAMP IS USED FOR INNER SUB ASSY ONLY.
- 3.) SLIDE WINDOW DETAILS AND PIN THEM IN PLACE.
- 4.) PERFORM ALL SIGHT CHECKS.
- 5.) VERIFY ALL NETS WITH .10mm FEELER. RESET PART IF NECESSARY. CONTACT FACILATOR IF PROBLEM CONTINUES.
- 6.) COMPLETE ALL LEVEL 4 POINTS, REFER TO POINT & METHOD.

4.2.P1.M1

To be completed by Fixture Manufacturer prior to OAC buy-off

Date: _____

Part Name:	Part Number:
Tool Number:	Part At E.C. Level:
Fixture At Engineering Level:	
Checking Fixture Engineer:	
Build Source:	

	Fixture Construction Checklist	Ok	Reject	Approved By
1	Approved Design signed off by OAC Representative.			
2	Latest E.C incorporated & stamped on tag.			
3	Fixture built to design.			
4	Fixture built to OAC standards.			
5	Templates operational.			
6	Locking pins operational.			
7	Flush checks identified.			
8	Feeler checks identified (3mm).			
9	Sight checks.			
10	Probe / SPC checks operational.			
11	Clamps (90 deg., numbered, operational).			
12	Locators / Locating scheme (OAC approved)			
13	Measuring points identified to customer specs. (OAC approved)			
14	Fixture built in body position (or 90 deg.)			
15	Body lines identified.			
16	Start points identified.			
17	Check rails.			
18	Hand applies.			
19	Plug checks / Keepers - Cables.			
20	Gage / Scribe pins (Fit to bushings).			
21	Proper paint scheme.			
22	Sequence of operations / Tags / Attached in clear view.			
23	Safety hoist rings / Eye bolts / Handling holes / Carts.			
24	Gage R&R.			
25	Fixture Certification.			
26	IGES data (Received)			

Comments/Concerns:

OAC Engineer

Date: _____

Manufacturing Source:

Date: _____

1.0 Performing the Gage R&R

Customer requirements determine which method of Gage R&R is to be used. The number of parts being measured, the number of appraisers, and the number of times each appraiser measures each part is not fixed. A minimum study, according to AIAG standards, would consist of five parts, two appraisers, with two trials for each appraiser. Depending on availability of panels, a one panel, two appraiser, two trial method could be used until a time when more panels would be available. This would need approval by an OAC Quality Systems Engineer.

Example: Two appraisers measuring five parts.

1. Appraiser A takes the first panel out of its storage rack and loads it into the fixture, and then measures every SPC point, both Flush and Gap on the part.
2. Appraiser A then puts the panel into a rack and loads the next panel into the fixture and measures it. Steps 1 and 2 continue until 5 parts have been measured.
3. Appraiser B performs the same steps in the same order as Appraiser A.
4. When they have both completed all the steps, the first trial is done. To complete the entire study, two trials must be done.

2.0 Gage R&R Data Reports

You may use the enclosed AIAG "Gage repeatability and Reproducibility data sheet" to record your measurements for each of the SPC points on the fixture. You do not have to complete the entire data form. Only the data and the identification items must be completed.

The entire Gage R&R report must contain:

Cover Sheet:

1. Your company's name, address, and the name of the person in charge of the project for your company.
2. The part number, complete with engineering change level or prototype designation.
3. The names of the appraisers and the date(s) of the study.

Data Report:

1. All the required data, clearly organized to show the SPC point, characteristic being measured, engineering tolerance, the trial number, part being measured, which appraiser made the measurement, and the measurement made-to two decimals.

These other data report formats are acceptable:

1. Typed or clearly legible data report.
2. Printed report from a data collection software or transposed text.
3. Electronic media: text, Microsoft Word, or Microsoft Excel file format.

Terminology

- 1.0 Gage R&R studies are used to determine the amount of measurement error or variation present in the system.
- 2.0 Variation is the difference between the actual size of the object being measured and its reported size. This is also referred to as measurement error.
- 3.0 A trial consists of one complete sequence of all appraisers measuring each part.
- 4.0 For Gage R&R studies there are three general types of variation, Repeatability or Equipment Variations, Reproducibility or Appraiser Variations, and Part Variation. Equipment Variation is associated with the instrument that is used to make the measurement. Appraiser Variation is associated with the person taking the measurements. The Part Variation is the amount of error that is due to the part being measured repeatedly.
- 5.0 The completed Gage R&R Study shows the Equipment Variation, the Appraiser Variation, and the Part Variation separately. The percent R&R must be less than 10% to be considered unconditionally acceptable, but it may be as high as 30% and still be conditionally acceptable, with explanations. Any Percent R&R over 30% has to be corrected and reduced to an acceptable percentage. The Percent R&R is expressed as a percentage of the Process variation or as a percent of the engineering tolerance for the measurement being made. Either is an acceptable method of evaluating the R&R study.

Tips

- 1.0 Make sure that your instruments, calipers, flush gages, digital to analog transducers and data collectors, are set up properly and that they are calibrated and in good working order.
- 2.0 Always number the parts and make sure that they are measured in the same order for every trial.
- 3.0 Always follow the fixture loading instructions to the letter and in the proper order.
- 4.0 Take your time! Make sure of each measurement before you record it.



Enter the part
identification here

Appraiser Trial #	PART										Average
	1	2	3	4	5	6	7	8	9	10	
1 A. 1.											
2 2.			Enter the individual measurements made by								
3 3.	Auditor "A" here										
4 Average											\bar{X}_a
5 Range											\bar{R}_a
6 B. 1.											
7 2.											
8 3.	Enter Auditor "B" measurements here										
9 Average											\bar{X}_b
10 Range											\bar{R}_b
11 C. 1.											
12 2.											
13 3.											
14 Average											\bar{X}_c
15 Range											\bar{R}_c
16 Part Average											
17	{ [Range (A) + Range (B) + Range (C)] / (# of Appraisers) } = "R Double Bar"										
18	(Max (X) Bar) - (Min (X) Bar) = (X) Bar Difference										
19	("R Double Bar") x [D4] = UCL(R)										
20	("R Double Bar") x [D3] = LCL(R)										

* D4 = 3.27 for 2 trials and 2.58 for 3 trials. UCL represents the limit of individual R's. Circle those that are beyond this limit. Identify the cause and correct. Repeat these readings using the same appraiser and unit as originally used or discard values and re-average and recompute R and the limiting value from the remaining observations.
D3 = 0 , for up to 7 trials.