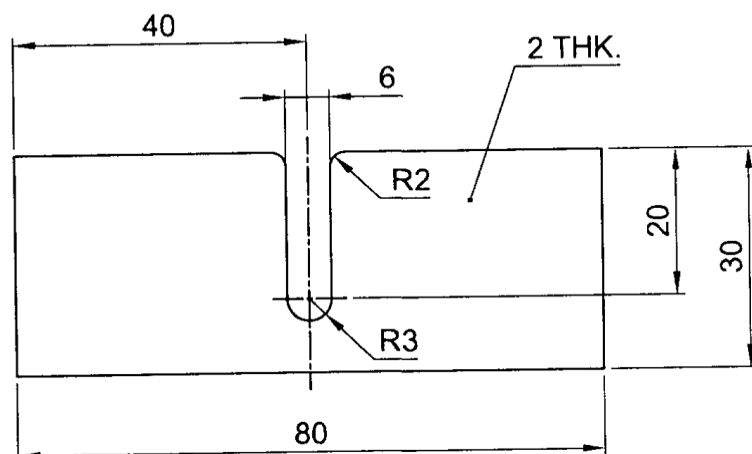
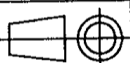


QUALITY OF WELD JOINTS REF, ISO: 5817



## UN CONTROLLED

| SURFACE ROUGHNESS |     | N12 | N11 | N10  | N9  | N8  | N7  | N6  | N5  | N4  | N3  | N2   | N1    |
|-------------------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|------|-------|
| GRADE             | No. |     |     |      |     |     |     |     |     |     |     |      |       |
| VALUE             |     | 50  | 25  | 12.5 | 6.3 | 3.2 | 1.6 | 0.8 | 0.4 | 0.2 | 0.1 | 0.05 | 0.025 |
| SYMBOL            |     | ~   | ▽   |      |     | ▽   |     | ▽   | ▽   | ▽   | ▽   | ▽    | ▽     |

|        |     |   |  |             |  |                                  |  |   |  |   |
|--------|-----|---|--|-------------|--|----------------------------------|--|---|--|---|
|        |     |   |  |             |  | 80 x 30 x 2 THK.                 |  | AL. ALLOY SHEET TO<br>Gr:51000-A, CONDITION 'O'<br>OF IS:737-1986 |  |   |
| SL No. | QTY | DRG. / STOCK No.                                  |  | DESCRIPTION |  | SIZE                             |  | COMPANY.STD/IS.STD  |  | Wt.Kg   |
|        |     | DETAIL PARTS                                      |  |             |  | MATERIAL                         |  |   |  |   |
|        |     |   |  |             |  | PRODUCT                          |  |   |  |   |
|        |     |   |  |             |  | DMRC BG METRO CARS               |  |   |  |   |
|        |     |   |  |             |  | SURFACE TREATMENT                |  |   |  |   |
|        |     |   |  |             |  | APPROVED <i>[Signature]</i> 12/9 |  |   |  |   |
|        |     |   |  |             |  | CHECKED <i>[Signature]</i> 12/9  |  |   |  |   |
|        |     |   |  |             |  | DRAWN ILYAS 12/9                 |  |   |  |   |
|        |     |   |  |             |  | REF DRG                          |  |   |  |   |
| 1      |     | NEXT ASSEMBLY<br>DETAILS UPDATED.<br>ECN:90900426 |  | 22.04.15    |  | SUNIL                            |  |   |  |   |
| ALT    |     | CHANGES / ECN No.                                 |  | DATE        |  | BY                               |  | CKD   |  | APP   |
|        |     |   |  |             |  |                                  |  | QTY   |  | NEXT ASSY   |
|        |     |   |  |             |  |                                  |  | MODEL   |  |   |
|        |     |   |  |             |  |                                  |  | SCALE 1:1   |  |  |
|        |     |   |  |             |  |                                  |  | SHEET OF  |  | Wt (Kg)   |
|        |     |   |  |             |  |                                  |  | DRG No.   |  | ALT   |
|        |     |   |  |             |  |                                  |  | 909-19543   |  | 1   |
|        |     |   |  |             |  |                                  |  | TITLE   |  |   |
|        |     |   |  |             |  |                                  |  | SPACER  |  |   |

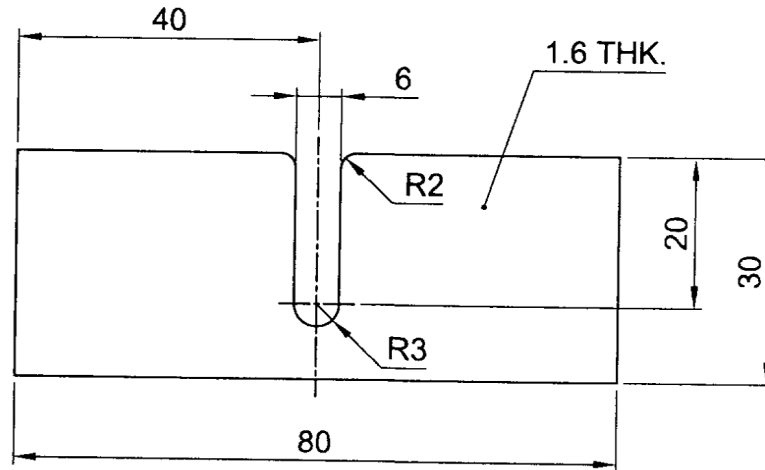
FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227

UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)

VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS.1012.C.

QUALITY OF WELD JOINTS REF, ISO: 5817

PROTO/PILOT/PRODUCTION



**UN CONTROLLED**

|                   |     |                  |  |             |  |                    |  |   |  |
|-------------------|-----|------------------|--|-------------|--|--------------------|--|---|--|
|                   |     |                  |  |             |  | 80 x 30 x 1.6 THK  |  | AL. ALLOY SHEET TO<br>Gr:51000-A, CONDITION 'O'<br>OF IS:737-1986 |  |
| SL No.            | QTY | DRG. / STOCK No. |  | DESCRIPTION |  | SIZE               |  | COMPANY.STD/IS.STD Wt.Kg  |  |
| DETAIL PARTS      |     |                  |  |             |  | MATERIAL           |  |   |  |
| PRODUCT           |     |                  |  |             |  | DMRC BG METRO CARS |  |   |  |
| SURFACE TREATMENT |     |                  |  |             |  |                    |  |   |  |
| APPROVED          |     |                  |  |             |  | 12/9               |  |   |  |
| CHECKED           |     |                  |  |             |  | 12/9               |  |   |  |
| DRAWN             |     |                  |  |             |  | 12/9               |  |   |  |
| REF DRG           |     |                  |  |             |  |                    |  |   |  |
| SCALE             |     |                  |  |             |  | SHEET Wt (Kg)      |  |   |  |
| 1:1               |     |                  |  |             |  | OF                 |  |   |  |
| DRG No.           |     |                  |  |             |  | ALT                |  |   |  |
| 909-19544         |     |                  |  |             |  | 1                  |  |   |  |

|   |   |          |       |     |     |        |           |           |       |
|---|---|----------|-------|-----|-----|--------|-----------|-----------|-------|
| 1   | NEXT ASSEMBLY<br>DETAILS UPDATED.<br>ECN:90900426 | 22.04.15 | SUNIL |     |     |        |           |           |       |
| ALT   | CHANGES / ECN No.                                 | DATE     | BY    | CKD | APP | QTY    | NEXT ASSY | MODEL     | TITLE |
| BEML LIMITED<br>R&D, BANGALORE COMPLEX<br>BANGALORE 560 075 |   |          |       |     |     | SPACER |           | 909-19544 |       |



BEML LIMITED  
R&D, BANGALORE COMPLEX  
BANGALORE 560 075

SPACER

909-19544

1

|           |       |      |     |     |     |     |     |     |     |      |     |     |       |        |                      |
|-----------|-------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-------|--------|----------------------|
| GRADE No. | N1    | N2   | N3  | N4  | N5  | N6  | N7  | N8  | N9  | N10  | N11 | N12 | VALUE | SYMBOL | SURFACE<br>ROUGHNESS |
|           | 0.025 | 0.05 | 0.1 | 0.2 | 0.4 | 0.8 | 1.6 | 3.2 | 6.3 | 12.5 | 25  | 50  |       |        |                      |

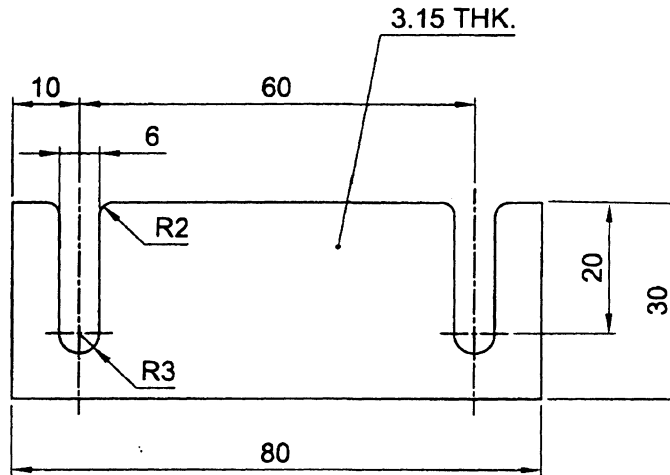
FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227

UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)

VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS.1012.C.

QUALITY OF WELD JOINTS REF, ISO: 5817

PROTO/PILOT/PRODUCTION



UN CONTROLLED

| GRADE No.         | N1    | N2   | N3  | N4  | N5  | N6  | N7  | N8  | N9  | N10  | N11 | N12 |
|-------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| VALUE             | 0.025 | 0.05 | 0.1 | 0.2 | 0.4 | 0.8 | 1.5 | 3.2 | 6.3 | 12.5 | 25  | 50  |
| SYMBOL            |       |      |     |     |     |     |     |     |     |      |     |     |
| SURFACE ROUGHNESS |       |      |     |     |     |     |     |     |     |      |     |     |

|   |                   |                  |                                  |                    |       |   |         |
|---|-------------------|------------------|----------------------------------|--------------------|-------|---|---------|
|   |                   |                  |                                  | 80 x 30 x 3.15 THK |       | AL. ALLOY SHEET TO Gr:51000-A, CONDITION 'O' OF IS:737-1986 |         |
| SL No.  | QTY               | DRG. / STOCK No. | DESCRIPTION                      |                    | SIZE  | COMPANY STD/IS STD  | Wt. Kg  |
| DETAIL PARTS  |                   |                  | MATERIAL                         |                    |       |   |         |
| PRODUCT   |                   |                  | DMRC BG METRO CARS               |                    |       |   |         |
|   |                   |                  | SURFACE TREATMENT                |                    |       |   |         |
|   |                   |                  | APPROVED <i>[Signature]</i> 12/9 |                    |       |   |         |
|   |                   |                  | CHECKED <i>[Signature]</i> 12/9  |                    |       |   |         |
|   |                   |                  | DRAWN ILYAS 12/9                 |                    |       |   |         |
| NEXT ASSEMBLY DETAILS UPDATED. ECN:90900426           |                   |                  | 22.04.15                         | SUNIL              | Guany | REF DRG EC05081-006   |         |
| 48  | EC05192           | DT-CAR           | SCALE 1:1                        |                    |       |   |         |
| 54  | EC05193           | M/T-CAR          | SHEET OF                         |                    |       |   |         |
| ALT   | CHANGES / ECN No. | DATE             | BY                               | CKD                | APP   | QTY   | Wt (Kg) |
| TITLE   |                   |                  | SPACER                           |                    |       | DRG No. 909-19545   |         |
| BETL LIMITED R&D, BANGALORE COMPLEX BANGALORE 560 075 |                   |                  |                                  |                    |       | ALT   |         |

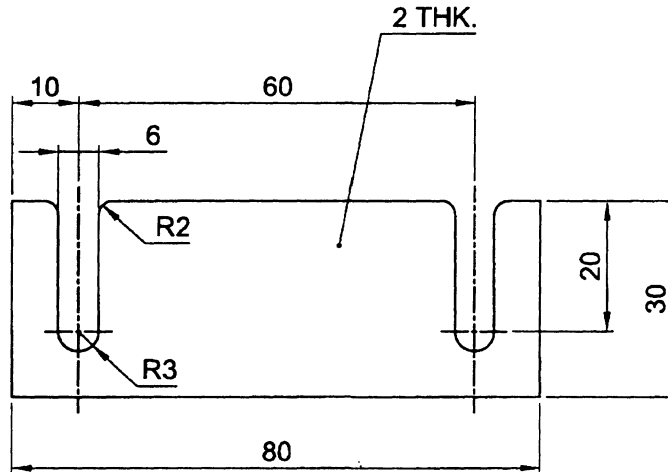
FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227

UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)

VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS.1012.C.

QUALITY OF WELD JOINTS REF, ISO: 5817

PROTO/PILOT/PRODUCTION



**UN CONTROLLED**

| GRADE No.         | N1    | N2   | N3  | N4  | N5  | N6  | N7  | N8  | N9  | N10  | N11 | N12 |
|-------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| VALUE             | 0.025 | 0.05 | 0.1 | 0.2 | 0.4 | 0.8 | 1.5 | 3.2 | 6.3 | 12.5 | 25  | 50  |
| SYMBOL            |       |      |     |     |     |     |     |     |     |      |     |     |
| SURFACE ROUGHNESS |       |      |     |     |     |     |     |     |     |      |     |     |

|        |     |                  |   |                  |           |   |         |
|--------|-----|------------------|---|------------------|-----------|---|---------|
|        |     |                  |   | 80 x 30 x 2 THK. |           | AL. ALLOY SHEET TO Gr:51000-A, CONDITION 'O' OF IS:737-1986 |         |
| SL No. | QTY | DRG. / STOCK No. | DESCRIPTION   |                  | SIZE      | COMPANY STD/IS STD  | Wt.Kg   |
|        |     |                  | DETAIL PARTS  |                  | MATERIAL  |   |         |
|        |     |                  | PRODUCT <b>DMRC BG METRO CARS</b>                     |                  |           |   |         |
|        |     |                  | SURFACE TREATMENT                                     |                  |           |   |         |
|        |     |                  | APPROVED  |                  |           |   |         |
|        |     |                  | CHECKED   |                  |           |   |         |
|        |     |                  | DRAWN ILYAS   |                  |           |   |         |
|        |     |                  | REF DRG EC05081-007                                   |                  |           |   |         |
| 1      |     |                  | NEXT ASSEMBLY DETAILS UPDATED. ECN:90900426           |                  | 48        | EC05192   | DT-CAR  |
|        |     |                  | 22.04.15  |                  | 54        | EC05193   | M/T-CAR |
|        |     |                  | SUNIL   |                  | SCALE 1:1 |   |         |
|        |     |                  | DATE  |                  | SHEET OF  |   |         |
|        |     |                  | BY  |                  | Wt (Kg)   |   |         |
|        |     |                  | CKD   |                  | ALT       |   |         |
|        |     |                  | APP   |                  | 1         |   |         |
| ALT    |     |                  | CHANGES / ECN No.                                     |                  | DRG No.   |   |         |
|        |     |                  | DATE  |                  | 909-19546 |   |         |
|        |     |                  | BY  |                  | ALT       |   |         |
|        |     |                  | CKD   |                  | 1         |   |         |
|        |     |                  | APP   |                  |           |   |         |
|        |     |                  | TITLE <b>SPACER</b>                                   |                  |           |   |         |
|        |     |                  | BEML LIMITED R&D, BANGALORE COMPLEX BANGALORE 560 075 |                  |           |   |         |

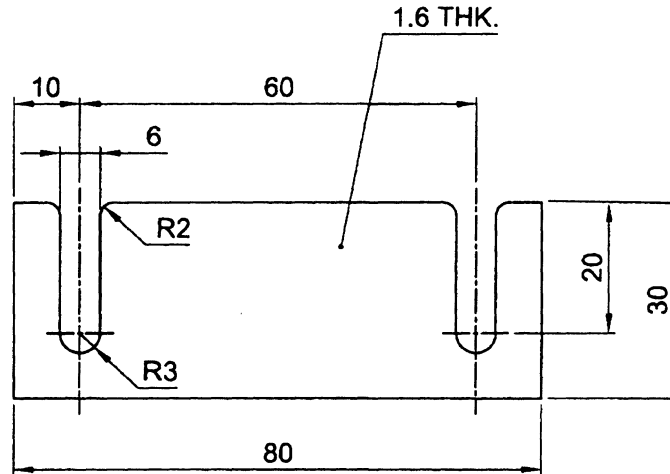
FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227

UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)

VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS.1012.C.

QUALITY OF WELD JOINTS REF, ISO: 5817

PROTO/PILOT/PRODUCTION



UN CONTROLLED

| GRADE No.         | N12 | N11 | N10  | N9  | N8  | N7  | N6  | N5  | N4  | N3  | N2   | N1    |
|-------------------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|------|-------|
| VALUE             | 50  | 25  | 12.5 | 6.3 | 3.2 | 1.6 | 0.8 | 0.4 | 0.2 | 0.1 | 0.05 | 0.025 |
| SYMBOL            | ▽   | ▽   | ▽    | ▽   | ▽   | ▽   | ▽   | ▽   | ▽   | ▽   | ▽    | ▽     |
| SURFACE ROUGHNESS |     |     |      |     |     |     |     |     |     |     |      |       |

|        |                   |   |         |                   |           |   |                            |
|--------|-------------------|---|---------|-------------------|-----------|---|----------------------------|
|        |                   |   |         | 80 x 30 x 1.6 THK |           | AL. ALLOY SHEET TO Gr:51000-A, CONDITION 'O' OF IS:737-1986 |                            |
| SL No. | QTY               | DRG. / STOCK No.                                      |         | DESCRIPTION       |           | SIZE  | COMPANY STD/IS STD   Wt.Kg |
|        |                   | DETAIL PARTS  |         |                   |           | MATERIAL  |                            |
|        |                   | PRODUCT DMRC BG METRO CARS                            |         |                   |           |   |                            |
|        |                   | SURFACE TREATMENT                                     |         |                   |           |   |                            |
|        |                   | APPROVED <i>[Signature]</i> 12/9                      |         |                   |           |   |                            |
|        |                   | CHECKED <i>[Signature]</i> 12/9                       |         |                   |           |   |                            |
|        |                   | DRAWN ILYAS 12/9                                      |         |                   |           |   |                            |
| △      |                   | NEXT ASSEMBLY DETAILS UPDATED. ECN:90900426           |         | 22.04.15          | SUNIL     | REF DRG EC05081-008   |                            |
|        |                   | 48  | EC05192 | DT-CAR            | SCALE 1:1 |   |                            |
|        |                   | 54  | EC05193 | M/T-CAR           | SHEET OF  |   |                            |
| ALT    | CHANGES / ECN No. | DATE  | BY      | CKD               | APP       | QTY   | Wt (Kg)                    |
|        |                   | TITLE   |         | SPACER            |           | DRG No. 909-19547   |                            |
|        |                   | BEML LIMITED R&D, BANGALORE COMPLEX BANGALORE 560 075 |         |                   |           | ALT 1   |                            |

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|   |           |       |        |          |           |          |           |           |            |    |
|---|-----------|-------|--------|----------|-----------|----------|-----------|-----------|------------|----|
| MACHINING DEVIATIONS<br>FOR LINEAR DIMENSIONS | RANGE     | 0 - 6 | 6 - 30 | 30 - 120 | 120 - 315 | 315-1000 | 1000-2000 | 2000-4000 | ABOVE 4000 | RA |
|   | TOLERANCE | ±0.1  | ±0.2   | ±0.3     | ±0.5      | ±0.8     | ±1.2      | ±2        | ±3         | ~  |

FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227

UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)

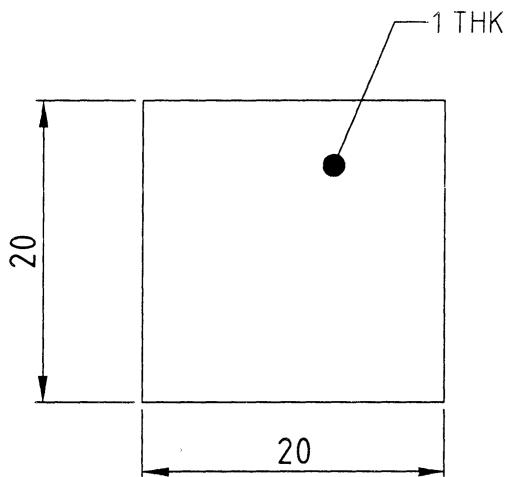
QUALITY OF WELD JOINTS REF. RD 230 MEDIUM

VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS. 1012.C

WELDING SHALL BE CARRIED OUT AS PER IS. 9595-96

STATUS:

## PRODUCTION



NOTE:

1. REMOVE ALL SHARP EDGES AND BURRS.

## UN CONTROLLED

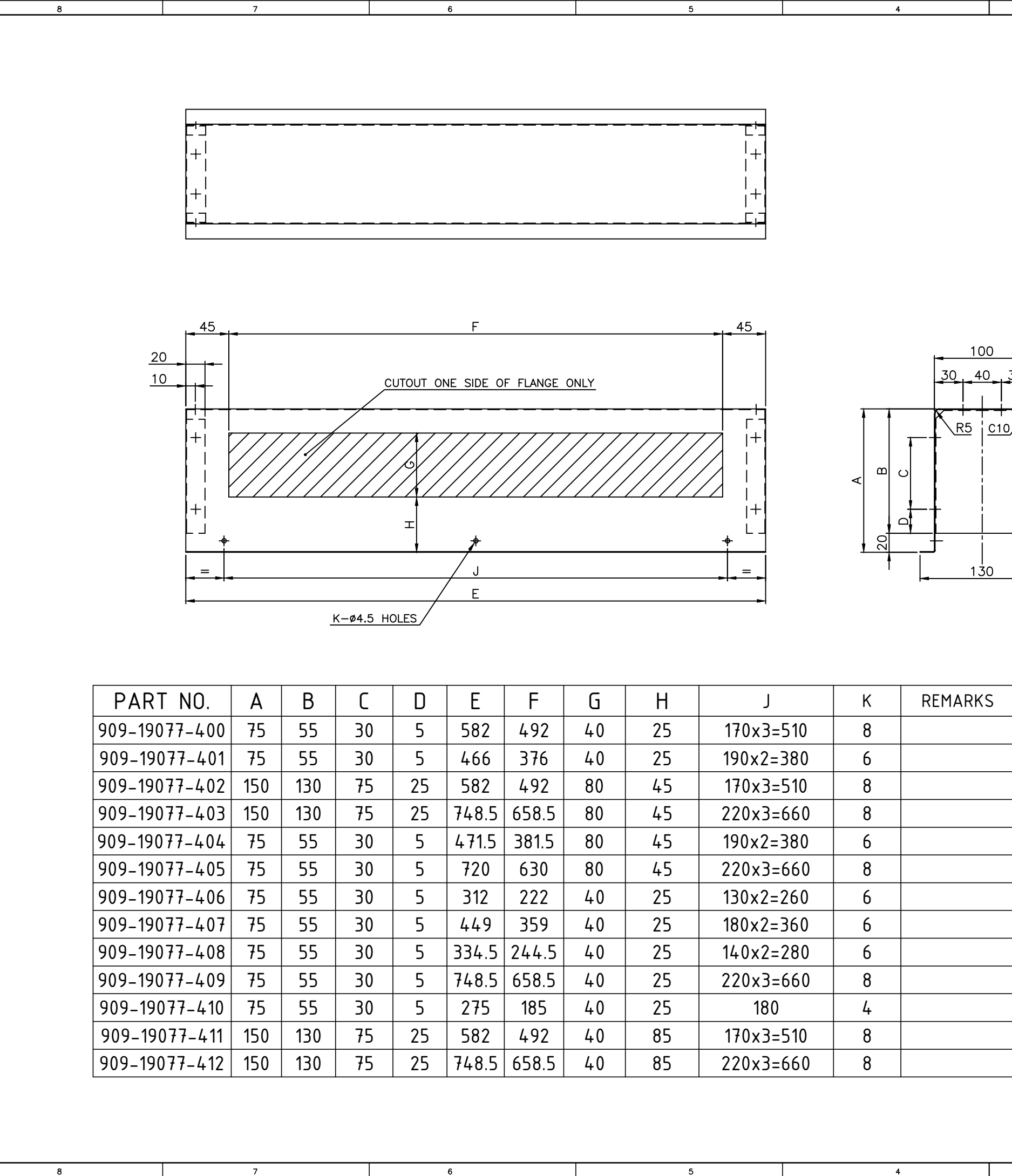
[illegible]



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DRAWING RELEASED FROM PDM PHYSICAL SIGNATURE NOT REQUIRED

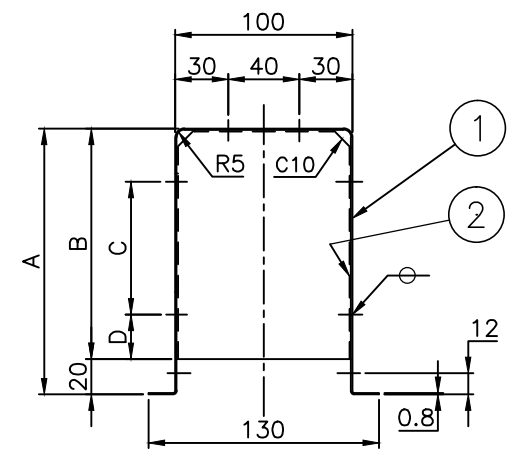
GRADE No. VALUE SYMBOL

SURFACE ROUGHNESS














|  |           |       |        |          |           |          |  |           |                  |    |
|--|-----------|-------|--------|----------|-----------|----------|--|-----------|------------------|----|
| MACHINING DEVIATIONS FOR LINEAR DIMENSIONS   | RANGE     | 0 - 6 | 6 - 30 | 30 - 120 | 120 - 315 | 315-1000 | 1000-2000  | 2000-4000 | ABOVE 4000       | RA |
|  | TOLERANCE | ±0.1  | ±0.2   | ±0.3     | ±0.5      | ±0.8     | ±1.2   | ±2        | ±3               | ~  |
| FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227 |           |       |        |          |           |          | QUALITY OF WELD JOINTS REF. RD 230 MEDIUM                        |           |                  |    |
| UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)     |           |       |        |          |           |          | VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS. 1012.C |           |                  |    |
| WELDING SHALL BE CARRIED OUT AS PER IS: 9595-96  |           |       |        |          |           |          | STATUS:  |           | PROTO/PRODUCTION |    |

UN CONTROLLED



| PART NO.      | A   | B   | C  | D  | E     | F     | G  | H  | J         | K | REMARKS |
|---------------|-----|-----|----|----|-------|-------|----|----|-----------|---|---------|
| 909-19077-400 | 75  | 55  | 30 | 5  | 582   | 492   | 40 | 25 | 170x3=510 | 8 |         |
| 909-19077-401 | 75  | 55  | 30 | 5  | 466   | 376   | 40 | 25 | 190x2=380 | 6 |         |
| 909-19077-402 | 150 | 130 | 75 | 25 | 582   | 492   | 80 | 45 | 170x3=510 | 8 |         |
| 909-19077-403 | 150 | 130 | 75 | 25 | 748.5 | 658.5 | 80 | 45 | 220x3=660 | 8 |         |
| 909-19077-404 | 75  | 55  | 30 | 5  | 471.5 | 381.5 | 80 | 45 | 190x2=380 | 6 |         |
| 909-19077-405 | 75  | 55  | 30 | 5  | 720   | 630   | 80 | 45 | 220x3=660 | 8 |         |
| 909-19077-406 | 75  | 55  | 30 | 5  | 312   | 222   | 40 | 25 | 130x2=260 | 6 |         |
| 909-19077-407 | 75  | 55  | 30 | 5  | 449   | 359   | 40 | 25 | 180x2=360 | 6 |         |
| 909-19077-408 | 75  | 55  | 30 | 5  | 334.5 | 244.5 | 40 | 25 | 140x2=280 | 6 |         |
| 909-19077-409 | 75  | 55  | 30 | 5  | 748.5 | 658.5 | 40 | 25 | 220x3=660 | 8 |         |
| 909-19077-410 | 75  | 55  | 30 | 5  | 275   | 185   | 40 | 25 | 180       | 4 |         |
| 909-19077-411 | 150 | 130 | 75 | 25 | 582   | 492   | 40 | 85 | 170x3=510 | 8 |         |
| 909-19077-412 | 150 | 130 | 75 | 25 | 748.5 | 658.5 | 40 | 85 | 220x3=660 | 8 |         |

|   |                |                  |           |      |   |                    |   |            |
|---|----------------|------------------|-----------|------|---|--------------------|---|------------|
| 2   | 2              | 909-19077-02     | STIFFENER |      | 0.8THK  | A5005P             |   |            |
| 1   | 1              | 909-19077-01     | AIR DUCT  |      | 0.8THK  | A5005P             |   |            |
| SL.No.  | QTY            | PART / STOCK No. |           |      | DESCRIPTION   | SIZE               | COMPANY STD./I.S  | Wt. (Kg)   |
|   |                |                  |           |      |   |                    | MATERIAL  |            |
|  |                |                  |           |      | PRODUCT   | DMRC BG METRO CARS |   |            |
|   |                |                  |           |      | REF DRG   |                    |   |            |
|  |                |                  |           |      | MATERIAL  |                    |   |            |
|   |                |                  |           |      | HEAT TREAT.   | APPD               |  | 04.04.2018 |
|   |                |                  |           |      | SURFACE TREAT.  | REVD               |  | 04.04.2018 |
|  |                |                  |           |      | TITLE   | CHKD               |  | 04.04.2018 |
|   |                |                  |           |      | AIR DUCT ASSY   | DRWN               |  | 04.04.2018 |
|   |                |                  |           |      |   | SCALE              |  | SHEET      |
|  |                |                  |           |      | NTS   | 1 OF 1             |   | -          |
| ALT.No.   | ECN NO/CHANGES | DATE             | BY        | CHKD | APPD  | DRG No.            | ALT   |            |
|   |                |                  |           |      |  <b>BEM</b> LIMITED<br><small>BEAR ENGINEERING &amp; MANUFACTURING</small> | 909-19077          |  |            |

BEML LIMITED

909-19077