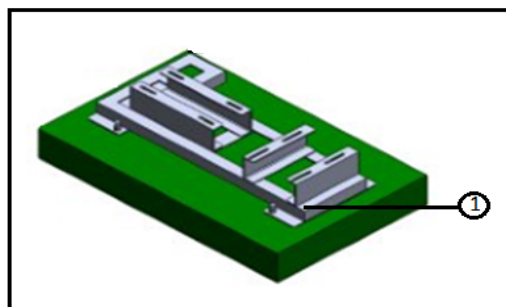


# Vibration Measurement Table For Single Fuel System

|                   |           |
|-------------------|-----------|
| Date              | 07-Okt-19 |
| Starting Time     | 09.00 Wib |
| Measurement Point | 1         |

|                  |      |
|------------------|------|
| Rotation ( rpm ) | 1500 |
| Curent ( A )     | 4,1  |
| Voltase (V)      | 220  |

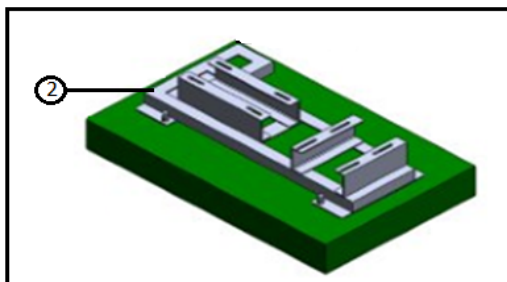


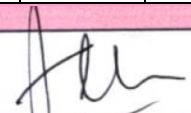
| Time Domain |                   | Axial    |            |                         | Vertical                 |            |                         | Horizontal           |            |                         |
|-------------|-------------------|----------|------------|-------------------------|--------------------------|------------|-------------------------|----------------------|------------|-------------------------|
| No.         | Time<br>( Secon ) | Dis (mm) | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                 | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)             | Vel (cm/s) | Acc (m/s <sup>2</sup> ) |
| 1           | 4                 | 0,002    | 0,115      | 4,150                   | 0,025                    | 0,135      | 4,650                   | 0,182                | 2,090      | 7,950                   |
| 2           | 8                 | 0,002    | 0,120      | 4,250                   | 0,020                    | 0,135      | 4,650                   | 0,176                | 2,040      | 7,700                   |
| 3           | 12                | 0,002    | 0,115      | 4,200                   | 0,021                    | 0,140      | 4,700                   | 0,174                | 2,015      | 7,600                   |
| 4           | 16                | 0,002    | 0,130      | 4,200                   | 0,027                    | 0,135      | 4,700                   | 0,174                | 2,045      | 7,600                   |
| 5           | 20                | 0,005    | 0,130      | 4,200                   | 0,024                    | 0,135      | 4,700                   | 0,174                | 2,045      | 7,600                   |
| 6           | 24                | 0,005    | 0,130      | 4,200                   | 0,024                    | 0,130      | 4,600                   | 0,181                | 2,120      | 7,900                   |
| 7           | 28                | 0,002    | 0,125      | 4,200                   | 0,023                    | 0,135      | 4,500                   | 0,184                | 2,145      | 8,100                   |
| 8           | 32                | 0,002    | 0,120      | 4,150                   | 0,032                    | 0,150      | 4,550                   | 0,184                | 2,145      | 8,100                   |
| 9           | 36                | 0,002    | 0,120      | 4,200                   | 0,022                    | 0,150      | 4,600                   | 0,188                | 2,170      | 8,100                   |
| 10          | 40                | 0,002    | 0,125      | 4,200                   | 0,019                    | 0,130      | 4,600                   | 0,188                | 2,190      | 8,100                   |
| 11          | 44                | 0,002    | 0,115      | 4,150                   | 0,025                    | 0,140      | 4,700                   | 0,185                | 2,210      | 8,150                   |
| 12          | 48                | 0,001    | 0,115      | 4,150                   | 0,040                    | 0,180      | 4,800                   | 0,185                | 2,160      | 8,000                   |
| 13          | 52                | 0,002    | 0,125      | 4,250                   | 0,025                    | 0,185      | 4,800                   | 0,185                | 2,160      | 8,000                   |
| 14          | 56                | 0,002    | 0,125      | 4,250                   | 0,024                    | 0,145      | 4,700                   | 0,182                | 2,160      | 7,900                   |
| 15          | 60                | 0,002    | 0,125      | 4,200                   | 0,024                    | 0,145      | 4,700                   | 0,182                | 2,160      | 7,900                   |
| Rata-rata   |                   | 0,002    | 0,122      | 4,197                   | 0,025                    | 0,145      | 4,663                   | 0,181                | 2,124      | 7,913                   |
|             |                   |          |            |                         | Measured by              |            |                         |                      |            |                         |
|             |                   |          |            |                         |                          |            |                         |                      |            |                         |
|             |                   |          |            |                         | Jupri Yanda Zaira, ST.MT |            |                         | Agus Wijianto, ST.MT |            |                         |

# Vibration Measurement Table For Single Fuel System

|                   |           |
|-------------------|-----------|
| Date              | 07-Okt-19 |
| Starting Time     | 09.25 Wib |
| Measurement Point | 2         |

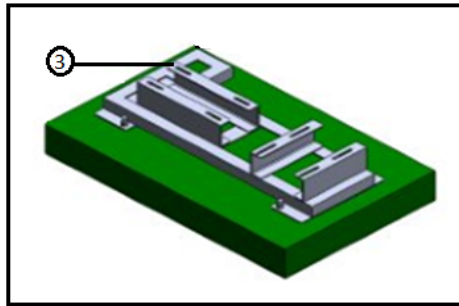
|                  |      |
|------------------|------|
| Rotation ( rpm ) | 1500 |
| Curent ( A )     | 4,1  |
| Voltase (V)      | 220  |

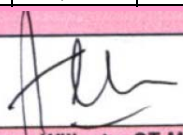


| Time Domain |                   | Axial    |            |                         | Vertical                                                                            |            |                         | Horizontal                                                                            |            |                         |
|-------------|-------------------|----------|------------|-------------------------|-------------------------------------------------------------------------------------|------------|-------------------------|---------------------------------------------------------------------------------------|------------|-------------------------|
| No.         | Time<br>( Secon ) | Dis (mm) | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                                                                            | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                                                                              | Vel (cm/s) | Acc (m/s <sup>2</sup> ) |
| 1           | 4                 | 0,002    | 0,130      | 4,500                   | 0,002                                                                               | 0,105      | 4,050                   | 0,005                                                                                 | 0,130      | 4,550                   |
| 2           | 8                 | 0,002    | 0,130      | 4,500                   | 0,002                                                                               | 0,115      | 4,150                   | 0,009                                                                                 | 0,145      | 4,450                   |
| 3           | 12                | 0,002    | 0,125      | 4,500                   | 0,002                                                                               | 0,125      | 4,150                   | 0,008                                                                                 | 0,115      | 4,200                   |
| 4           | 16                | 0,004    | 0,135      | 4,550                   | 0,002                                                                               | 0,115      | 4,100                   | 0,007                                                                                 | 0,130      | 4,300                   |
| 5           | 20                | 0,003    | 0,125      | 4,550                   | 0,002                                                                               | 0,120      | 4,150                   | 0,009                                                                                 | 0,165      | 4,350                   |
| 6           | 24                | 0,004    | 0,130      | 4,600                   | 0,002                                                                               | 0,115      | 4,150                   | 0,007                                                                                 | 0,190      | 4,300                   |
| 7           | 28                | 0,006    | 0,130      | 4,400                   | 0,002                                                                               | 0,115      | 4,100                   | 0,008                                                                                 | 0,190      | 4,250                   |
| 8           | 32                | 0,002    | 0,125      | 4,500                   | 0,002                                                                               | 0,115      | 4,100                   | 0,006                                                                                 | 0,185      | 4,300                   |
| 9           | 36                | 0,003    | 0,125      | 4,500                   | 0,002                                                                               | 0,125      | 4,200                   | 0,007                                                                                 | 0,115      | 4,150                   |
| 10          | 40                | 0,003    | 0,125      | 4,450                   | 0,002                                                                               | 0,130      | 4,100                   | 0,007                                                                                 | 0,165      | 4,350                   |
| 11          | 44                | 0,004    | 0,130      | 4,450                   | 0,002                                                                               | 0,135      | 4,300                   | 0,007                                                                                 | 0,175      | 4,350                   |
| 12          | 48                | 0,004    | 0,125      | 4,400                   | 0,002                                                                               | 0,125      | 4,150                   | 0,007                                                                                 | 0,140      | 4,250                   |
| 13          | 52                | 0,002    | 0,130      | 4,500                   | 0,002                                                                               | 0,130      | 4,200                   | 0,008                                                                                 | 0,160      | 4,150                   |
| 14          | 56                | 0,002    | 0,130      | 4,500                   | 0,002                                                                               | 0,125      | 4,150                   | 0,009                                                                                 | 0,175      | 4,250                   |
| 15          | 60                | 0,002    | 0,130      | 4,500                   | 0,002                                                                               | 0,130      | 4,300                   | 0,009                                                                                 | 0,120      | 4,100                   |
| Rata-rata   |                   | 0,003    | 0,128      | 4,493                   | 0,002                                                                               | 0,122      | 4,157                   | 0,007                                                                                 | 0,153      | 4,287                   |
|             |                   |          |            |                         | Measured by                                                                         |            |                         |                                                                                       |            |                         |
|             |                   |          |            |                         |  |            |                         |  |            |                         |
|             |                   |          |            |                         | Jupri Yanda Zaira, ST.MT                                                            |            |                         | Agus Wijianto, ST.MT                                                                  |            |                         |

|                   |           |
|-------------------|-----------|
| Date              | 07-Okt-19 |
| Starting Time     | 09.56 Wib |
| Measurement Point | 3         |

|                  |      |
|------------------|------|
| Rotation ( rpm ) | 1500 |
| Curent ( A )     | 4,1  |
| Voltase (V)      | 220  |

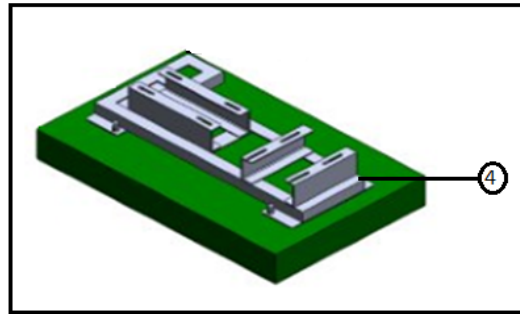


| Time Domain |                   | Axial    |            |            | Vertical                                                                            |            |            | Horizontal                                                                            |            |            |
|-------------|-------------------|----------|------------|------------|-------------------------------------------------------------------------------------|------------|------------|---------------------------------------------------------------------------------------|------------|------------|
| No.         | Time<br>( Secon ) | Dis (mm) | Vel (cm/s) | Acc (m/s2) | Dis (mm)                                                                            | Vel (cm/s) | Acc (m/s2) | Dis (mm)                                                                              | Vel (cm/s) | Acc (m/s2) |
| 1           | 4                 | 0,002    | 0,115      | 4,150      | 0,004                                                                               | 0,120      | 4,500      | 0,002                                                                                 | 0,130      | 4,600      |
| 2           | 8                 | 0,002    | 0,115      | 4,300      | 0,004                                                                               | 0,145      | 4,400      | 0,003                                                                                 | 0,130      | 4,700      |
| 3           | 12                | 0,002    | 0,120      | 4,200      | 0,002                                                                               | 0,130      | 4,350      | 0,003                                                                                 | 0,115      | 4,450      |
| 4           | 16                | 0,002    | 0,130      | 4,250      | 0,003                                                                               | 0,130      | 4,500      | 0,002                                                                                 | 0,135      | 4,550      |
| 5           | 20                | 0,002    | 0,135      | 4,150      | 0,003                                                                               | 0,130      | 4,500      | 0,002                                                                                 | 0,135      | 4,950      |
| 6           | 24                | 0,002    | 0,130      | 4,450      | 0,002                                                                               | 0,130      | 4,450      | 0,002                                                                                 | 0,130      | 4,550      |
| 7           | 28                | 0,002    | 0,125      | 4,300      | 0,003                                                                               | 0,120      | 4,100      | 0,004                                                                                 | 0,125      | 4,550      |
| 8           | 32                | 0,002    | 0,120      | 4,200      | 0,003                                                                               | 0,120      | 4,100      | 0,002                                                                                 | 0,120      | 4,350      |
| 9           | 36                | 0,002    | 0,120      | 4,400      | 0,003                                                                               | 0,135      | 4,350      | 0,002                                                                                 | 0,125      | 4,400      |
| 10          | 40                | 0,002    | 0,120      | 4,200      | 0,004                                                                               | 0,125      | 4,350      | 0,003                                                                                 | 0,130      | 4,550      |
| 11          | 44                | 0,002    | 0,125      | 4,200      | 0,002                                                                               | 0,120      | 4,400      | 0,006                                                                                 | 0,130      | 4,700      |
| 12          | 48                | 0,002    | 0,115      | 4,250      | 0,002                                                                               | 0,120      | 4,250      | 0,004                                                                                 | 0,125      | 4,450      |
| 13          | 52                | 0,002    | 0,125      | 4,450      | 0,017                                                                               | 0,090      | 3,450      | 0,002                                                                                 | 0,125      | 4,650      |
| 14          | 56                | 0,002    | 0,115      | 4,250      | 0,009                                                                               | 0,105      | 3,950      | 0,002                                                                                 | 0,135      | 4,500      |
| 15          | 60                | 0,002    | 0,130      | 4,250      | 0,011                                                                               | 0,110      | 3,900      | 0,002                                                                                 | 0,130      | 4,500      |
| Rata-rata   |                   | 0,002    | 0,123      | 4,267      | 0,005                                                                               | 0,122      | 4,237      | 0,002                                                                                 | 0,128      | 4,563      |
|             |                   |          |            |            | Measured by                                                                         |            |            |                                                                                       |            |            |
|             |                   |          |            |            |  |            |            |  |            |            |
|             |                   |          |            |            | Jupri Yanda Zaira, ST.MT                                                            |            |            | Agus Wijianto, ST.MT                                                                  |            |            |

| Vibration Measurement Table For Single Fuel System |           |                  |      |
|----------------------------------------------------|-----------|------------------|------|
| Date                                               | 07-Okt-19 | Rotation ( rpm ) | 1500 |

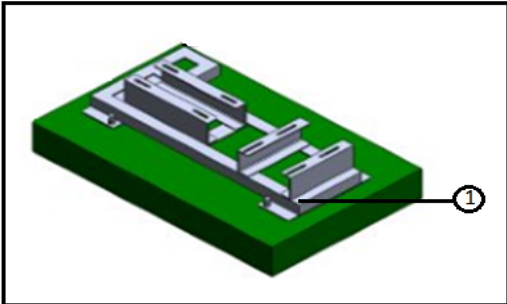
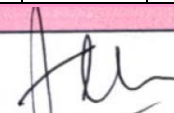
|                   |           |
|-------------------|-----------|
| Starting Time     | 10.32 Wib |
| Measurement Point | 4         |

|              |     |
|--------------|-----|
| Curent ( A ) | 4,1 |
| Voltase (V)  | 220 |

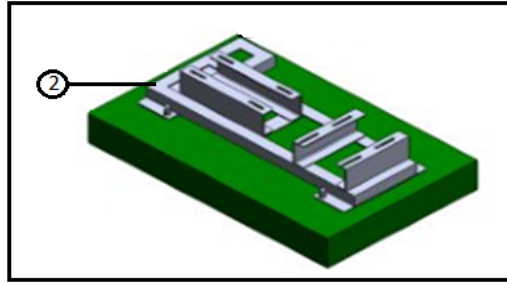


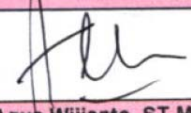
| Time Domain |                   | Axial    |            |            | Vertical                 |            |            | Horizontal           |            |            |
|-------------|-------------------|----------|------------|------------|--------------------------|------------|------------|----------------------|------------|------------|
| No.         | Time<br>( Secon ) | Dis (mm) | Vel (cm/s) | Acc (m/s2) | Dis (mm)                 | Vel (cm/s) | Acc (m/s2) | Dis (mm)             | Vel (cm/s) | Acc (m/s2) |
| 1           | 4                 | 0,002    | 0,105      | 3,950      | 0,020                    | 0,130      | 4,100      | 0,003                | 0,120      | 4,000      |
| 2           | 8                 | 0,002    | 0,110      | 4,000      | 0,012                    | 0,120      | 3,950      | 0,002                | 0,105      | 3,750      |
| 3           | 12                | 0,002    | 0,120      | 4,100      | 0,008                    | 0,110      | 3,900      | 0,002                | 0,110      | 3,850      |
| 4           | 16                | 0,001    | 0,120      | 3,950      | 0,005                    | 0,115      | 4,100      | 0,002                | 0,110      | 3,950      |
| 5           | 20                | 0,001    | 0,120      | 3,950      | 0,018                    | 0,115      | 4,050      | 0,002                | 0,110      | 3,850      |
| 6           | 24                | 0,001    | 0,120      | 3,950      | 0,019                    | 0,105      | 3,700      | 0,002                | 0,110      | 3,850      |
| 7           | 28                | 0,002    | 0,105      | 3,800      | 0,010                    | 0,105      | 3,850      | 0,002                | 0,105      | 3,850      |
| 8           | 32                | 0,002    | 0,110      | 3,900      | 0,012                    | 0,110      | 4,050      | 0,002                | 0,105      | 3,700      |
| 9           | 36                | 0,002    | 0,105      | 3,900      | 0,021                    | 0,105      | 3,800      | 0,002                | 0,110      | 3,800      |
| 10          | 40                | 0,002    | 0,105      | 3,950      | 0,004                    | 0,110      | 3,850      | 0,002                | 0,110      | 3,850      |
| 11          | 44                | 0,002    | 0,110      | 3,900      | 0,002                    | 0,115      | 3,950      | 0,003                | 0,105      | 3,850      |
| 12          | 48                | 0,002    | 0,110      | 4,000      | 0,002                    | 0,120      | 3,650      | 0,003                | 0,105      | 3,850      |
| 13          | 52                | 0,002    | 0,110      | 3,950      | 0,005                    | 0,110      | 3,800      | 0,002                | 0,110      | 3,900      |
| 14          | 56                | 0,007    | 0,115      | 4,100      | 0,008                    | 0,110      | 4,000      | 0,002                | 0,110      | 3,950      |
| 15          | 60                | 0,004    | 0,115      | 4,250      | 0,010                    | 0,115      | 3,950      | 0,002                | 0,115      | 3,850      |
| Rata-rata   |                   | 0,002    | 0,112      | 3,977      | 0,010                    | 0,113      | 3,913      | 0,002                | 0,109      | 3,857      |
|             |                   |          |            |            | Measured by              |            |            |                      |            |            |
|             |                   |          |            |            |                          |            |            |                      |            |            |
|             |                   |          |            |            | Jupri Yanda Zaira, ST.MT |            |            | Agus Wijianto, ST.MT |            |            |

| Vibration Measurement Table For Dual Fuel System |           |                  |      |
|--------------------------------------------------|-----------|------------------|------|
| Date                                             | 07-Okt-19 | Rotation ( rpm ) | 1500 |
| Starting Time                                    | 14.00 Wib | Curent ( A )     | 3,8  |

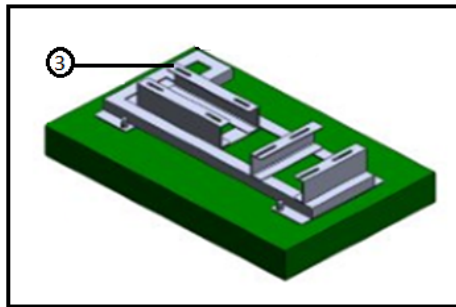
| Measurement Point                                                                             | 1                 | Voltase (V) | 220        |            |                                                                                     |            |            |                                                                                       |            |            |
|-----------------------------------------------------------------------------------------------|-------------------|-------------|------------|------------|-------------------------------------------------------------------------------------|------------|------------|---------------------------------------------------------------------------------------|------------|------------|
| <div></div> |                   |             |            |            |                                                                                     |            |            |                                                                                       |            |            |
| Time Domain                                                                                   |                   |             |            |            |                                                                                     |            |            |                                                                                       |            |            |
| No.                                                                                           | Time<br>( Secon ) | Axial       |            |            | Vertical                                                                            |            |            | Horizontal                                                                            |            |            |
|                                                                                               |                   | Dis (mm)    | Vel (cm/s) | Acc (m/s2) | Dis (mm)                                                                            | Vel (cm/s) | Acc (m/s2) | Dis (mm)                                                                              | Vel (cm/s) | Acc (m/s2) |
| 1                                                                                             | 4                 | 0,110       | 0,085      | 1,100      | 0,010                                                                               | 0,140      | 0,300      | 0,006                                                                                 | 0,080      | 1,600      |
| 2                                                                                             | 8                 | 0,160       | 0,075      | 1,100      | 0,009                                                                               | 0,140      | 2,600      | 0,007                                                                                 | 0,090      | 2,100      |
| 3                                                                                             | 12                | 0,003       | 0,055      | 1,250      | 0,008                                                                               | 0,110      | 2,150      | 0,007                                                                                 | 0,090      | 2,350      |
| 4                                                                                             | 16                | 0,004       | 0,050      | 1,200      | 0,010                                                                               | 0,125      | 2,100      | 0,007                                                                                 | 0,090      | 2,450      |
| 5                                                                                             | 20                | 0,004       | 0,065      | 1,250      | 0,013                                                                               | 0,130      | 2,600      | 0,007                                                                                 | 0,105      | 2,500      |
| 6                                                                                             | 24                | 0,007       | 0,070      | 1,300      | 0,010                                                                               | 0,125      | 2,700      | 0,006                                                                                 | 0,115      | 2,350      |
| 7                                                                                             | 28                | 0,006       | 0,075      | 1,350      | 0,005                                                                               | 0,125      | 2,100      | 0,007                                                                                 | 0,115      | 2,000      |
| 8                                                                                             | 32                | 0,008       | 0,060      | 1,350      | 0,005                                                                               | 0,105      | 2,050      | 0,008                                                                                 | 0,100      | 1,850      |
| 9                                                                                             | 36                | 0,006       | 0,070      | 1,350      | 0,005                                                                               | 0,135      | 2,500      | 0,005                                                                                 | 0,100      | 1,850      |
| 10                                                                                            | 40                | 0,006       | 0,065      | 1,300      | 0,008                                                                               | 0,150      | 2,650      | 0,006                                                                                 | 0,100      | 1,700      |
| 11                                                                                            | 44                | 0,003       | 0,055      | 1,300      | 0,011                                                                               | 0,175      | 3,250      | 0,020                                                                                 | 0,120      | 2,100      |
| 12                                                                                            | 48                | 0,003       | 0,050      | 1,400      | 0,008                                                                               | 0,150      | 3,500      | 0,009                                                                                 | 0,140      | 2,050      |
| 13                                                                                            | 52                | 0,055       | 0,075      | 1,600      | 0,010                                                                               | 0,150      | 3,150      | 0,009                                                                                 | 0,105      | 2,050      |
| 14                                                                                            | 56                | 0,003       | 0,085      | 1,500      | 0,011                                                                               | 0,155      | 3,050      | 0,009                                                                                 | 0,095      | 1,950      |
| 15                                                                                            | 60                | 0,085       | 0,095      | 1,300      | 0,013                                                                               | 0,130      | 2,700      | 0,008                                                                                 | 0,085      | 1,800      |
| Rata-rata                                                                                     |                   | 0,031       | 0,069      | 1,310      | 0,009                                                                               | 0,136      | 2,493      | 0,008                                                                                 | 0,102      | 2,047      |
|                                                                                               |                   |             |            |            | Measured by                                                                         |            |            |                                                                                       |            |            |
|                                                                                               |                   |             |            |            |  |            |            |  |            |            |
|                                                                                               |                   |             |            |            | Jupri Yanda Zaira, ST.MT                                                            |            |            | Agus Wijianto, ST.MT                                                                  |            |            |

| Vibration Measurement Table For Dual Fuel System |           |                  |      |
|--------------------------------------------------|-----------|------------------|------|
| Date                                             | 07-Okt-19 | Rotation ( rpm ) | 1500 |
| Starting Time                                    | 14.20 Wib | Curent ( A )     | 3,8  |
| Measurement Point                                | 2         | Voltase (V)      | 220  |



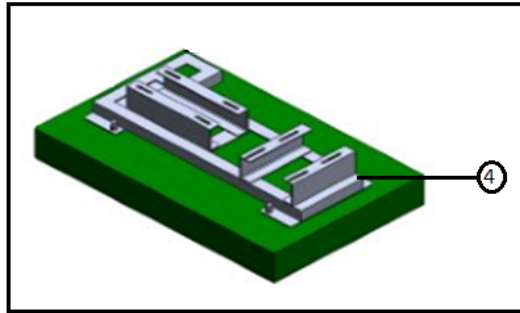
| Time Domain |                   |          |            |                         |                                                                                     |            |                         |                                                                                       |            |                         |
|-------------|-------------------|----------|------------|-------------------------|-------------------------------------------------------------------------------------|------------|-------------------------|---------------------------------------------------------------------------------------|------------|-------------------------|
| No.         | Time<br>( Secon ) | Axial    |            |                         | Vertical                                                                            |            |                         | Horizontal                                                                            |            |                         |
|             |                   | Dis (mm) | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                                                                            | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                                                                              | Vel (cm/s) | Acc (m/s <sup>2</sup> ) |
| 1           | 4                 | 0,068    | 0,125      | 1,300                   | 0,118                                                                               | 0,720      | 2,900                   | 0,216                                                                                 | 0,145      | 1,500                   |
| 2           | 8                 | 0,036    | 0,105      | 1,300                   | 0,092                                                                               | 0,670      | 2,900                   | 0,080                                                                                 | 0,105      | 1,500                   |
| 3           | 12                | 0,018    | 0,075      | 1,200                   | 0,082                                                                               | 0,670      | 2,900                   | 0,050                                                                                 | 0,080      | 1,550                   |
| 4           | 16                | 0,018    | 0,075      | 1,200                   | 0,089                                                                               | 0,675      | 2,900                   | 0,018                                                                                 | 0,070      | 1,500                   |
| 5           | 20                | 0,021    | 0,085      | 1,200                   | 0,092                                                                               | 0,710      | 2,900                   | 0,044                                                                                 | 0,075      | 1,450                   |
| 6           | 24                | 0,054    | 0,120      | 1,200                   | 0,092                                                                               | 0,700      | 2,900                   | 0,071                                                                                 | 0,065      | 1,400                   |
| 7           | 28                | 0,055    | 0,100      | 1,150                   | 0,069                                                                               | 0,550      | 2,900                   | 0,101                                                                                 | 0,085      | 1,450                   |
| 8           | 32                | 0,055    | 0,100      | 1,200                   | 0,073                                                                               | 0,580      | 2,900                   | 0,141                                                                                 | 0,115      | 1,500                   |
| 9           | 36                | 0,048    | 0,115      | 1,200                   | 0,084                                                                               | 0,645      | 2,900                   | 0,074                                                                                 | 0,085      | 1,450                   |
| 10          | 40                | 0,069    | 0,100      | 1,150                   | 0,094                                                                               | 0,715      | 2,900                   | 0,063                                                                                 | 0,085      | 1,500                   |
| 11          | 44                | 0,036    | 0,070      | 1,100                   | 0,089                                                                               | 0,730      | 2,900                   | 0,028                                                                                 | 0,080      | 1,450                   |
| 12          | 48                | 0,029    | 0,070      | 1,050                   | 0,089                                                                               | 0,725      | 2,950                   | 0,045                                                                                 | 0,090      | 1,550                   |
| 13          | 52                | 0,053    | 0,100      | 1,050                   | 0,080                                                                               | 0,715      | 2,950                   | 0,034                                                                                 | 0,085      | 1,500                   |
| 14          | 56                | 0,052    | 0,095      | 1,100                   | 0,084                                                                               | 0,735      | 2,950                   | 0,056                                                                                 | 0,095      | 1,450                   |
| 15          | 60                | 0,039    | 0,080      | 1,150                   | 0,085                                                                               | 0,735      | 2,900                   | 0,020                                                                                 | 0,080      | 1,400                   |
| Rata-rata   |                   | 0,043    | 0,094      | 1,170                   | 0,087                                                                               | 0,685      | 2,910                   | 0,069                                                                                 | 0,089      | 1,477                   |
|             |                   |          |            |                         | Measured by                                                                         |            |                         |                                                                                       |            |                         |
|             |                   |          |            |                         |  |            |                         |  |            |                         |
|             |                   |          |            |                         | Jupri Yanda Zaira, ST.MT                                                            |            |                         | Agus Wijianto, ST.MT                                                                  |            |                         |

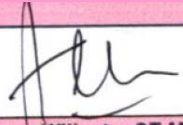
| Vibration Measurement Table For Dual Fuel System |           |  |                  |      |  |
|--------------------------------------------------|-----------|--|------------------|------|--|
| Date                                             | 07-Okt-19 |  | Rotation ( rpm ) | 1500 |  |
| Starting Time                                    | 14.55 Wib |  | Curent ( A )     | 3,8  |  |
| Measurement Point                                | 3         |  | Voltase (V)      | 220  |  |



| Time Domain |                   |          |            |                         |                          |            |                         |                      |            |                         |
|-------------|-------------------|----------|------------|-------------------------|--------------------------|------------|-------------------------|----------------------|------------|-------------------------|
| No.         | Time<br>( Secon ) | Axial    |            |                         | Vertical                 |            |                         | Horizontal           |            |                         |
|             |                   | Dis (mm) | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                 | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)             | Vel (cm/s) | Acc (m/s <sup>2</sup> ) |
| 1           | 4                 | 0,051    | 0,090      | 0,950                   | 0,033                    | 0,430      | 3,450                   | 0,013                | 0,085      | 1,450                   |
| 2           | 8                 | 0,219    | 0,460      | 1,100                   | 0,035                    | 0,435      | 3,450                   | 0,042                | 0,085      | 1,450                   |
| 3           | 12                | 0,666    | 1,035      | 1,300                   | 0,054                    | 4,350      | 3,500                   | 0,104                | 0,085      | 1,450                   |
| 4           | 16                | 0,165    | 0,120      | 0,950                   | 0,063                    | 0,405      | 3,600                   | 0,047                | 0,065      | 1,500                   |
| 5           | 20                | 0,165    | 0,110      | 0,900                   | 0,081                    | 0,450      | 3,500                   | 0,062                | 0,065      | 1,500                   |
| 6           | 24                | 0,153    | 0,110      | 0,900                   | 0,054                    | 0,510      | 3,400                   | 0,038                | 0,070      | 1,450                   |
| 7           | 28                | 0,144    | 0,100      | 0,900                   | 0,048                    | 0,455      | 3,250                   | 0,071                | 0,100      | 1,400                   |
| 8           | 32                | 0,132    | 0,130      | 0,950                   | 0,069                    | 0,415      | 3,300                   | 0,063                | 0,110      | 1,400                   |
| 9           | 36                | 0,110    | 0,100      | 0,950                   | 0,037                    | 0,390      | 3,300                   | 0,006                | 0,100      | 1,450                   |
| 10          | 40                | 0,103    | 0,135      | 0,950                   | 0,053                    | 0,330      | 3,400                   | 0,008                | 0,085      | 1,450                   |
| 11          | 44                | 0,168    | 0,140      | 0,950                   | 0,071                    | 0,320      | 3,400                   | 0,012                | 0,085      | 1,650                   |
| 12          | 48                | 0,159    | 0,135      | 0,950                   | 0,053                    | 0,365      | 3,500                   | 0,014                | 0,115      | 1,750                   |
| 13          | 52                | 0,241    | 0,115      | 0,950                   | 0,058                    | 0,410      | 3,500                   | 0,006                | 0,125      | 1,650                   |
| 14          | 56                | 0,169    | 0,090      | 0,900                   | 0,103                    | 0,440      | 3,450                   | 0,004                | 0,140      | 1,600                   |
| 15          | 60                | 0,150    | 0,080      | 0,900                   | 0,100                    | 0,415      | 3,400                   | 0,016                | 0,115      | 1,650                   |
| Rata-rata   |                   | 0,186    | 0,197      | 0,967                   | 0,060                    | 0,675      | 3,427                   | 0,033                | 0,095      | 1,520                   |
|             |                   |          |            |                         | Measured by              |            |                         |                      |            |                         |
|             |                   |          |            |                         |                          |            |                         |                      |            |                         |
|             |                   |          |            |                         | Jupri Yanda Zaira, ST.MT |            |                         | Agus Wijianto, ST.MT |            |                         |

| Vibration Measurement Table For Dual Fuel System |           |                  |      |
|--------------------------------------------------|-----------|------------------|------|
| Date                                             | 07-Okt-19 | Rotation ( rpm ) | 1500 |
| Starting Time                                    | 15.25 Wib | Curent ( A )     | 3,8  |
| Measurement Point                                | 4         | Voltase (V)      | 220  |



| Time Domain |                   |          |            |                         |                                                                                     |            |                         |                                                                                       |            |                         |
|-------------|-------------------|----------|------------|-------------------------|-------------------------------------------------------------------------------------|------------|-------------------------|---------------------------------------------------------------------------------------|------------|-------------------------|
| No.         | Time<br>( Secon ) | Axial    |            |                         | Vertical                                                                            |            |                         | Horizontal                                                                            |            |                         |
|             |                   | Dis (mm) | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                                                                            | Vel (cm/s) | Acc (m/s <sup>2</sup> ) | Dis (mm)                                                                              | Vel (cm/s) | Acc (m/s <sup>2</sup> ) |
| 1           | 4                 | 0,059    | 0,095      | 1,400                   | 0,024                                                                               | 0,375      | 2,700                   | 0,007                                                                                 | 0,080      | 1,700                   |
| 2           | 8                 | 0,126    | 0,120      | 1,450                   | 0,020                                                                               | 0,325      | 2,600                   | 0,216                                                                                 | 0,190      | 1,850                   |
| 3           | 12                | 0,147    | 0,135      | 1,450                   | 0,018                                                                               | 0,325      | 2,600                   | 2,145                                                                                 | 0,215      | 1,700                   |
| 4           | 16                | 0,080    | 0,095      | 1,400                   | 0,034                                                                               | 0,360      | 2,550                   | 0,021                                                                                 | 0,115      | 1,550                   |
| 5           | 20                | 0,008    | 0,085      | 1,350                   | 0,019                                                                               | 0,370      | 2,650                   | 0,008                                                                                 | 0,145      | 1,550                   |
| 6           | 24                | 0,005    | 0,085      | 1,350                   | 0,017                                                                               | 0,385      | 2,650                   | 0,002                                                                                 | 0,090      | 1,550                   |
| 7           | 28                | 0,034    | 0,090      | 1,350                   | 0,028                                                                               | 0,390      | 2,600                   | 0,007                                                                                 | 0,115      | 1,600                   |
| 8           | 32                | 0,039    | 0,090      | 1,300                   | 0,029                                                                               | 0,345      | 2,500                   | 0,007                                                                                 | 0,095      | 1,500                   |
| 9           | 36                | 0,005    | 0,065      | 1,300                   | 0,022                                                                               | 0,280      | 2,450                   | 0,041                                                                                 | 0,065      | 1,500                   |
| 10          | 40                | 0,004    | 0,075      | 1,300                   | 0,030                                                                               | 0,285      | 2,500                   | 0,005                                                                                 | 0,085      | 1,450                   |
| 11          | 44                | 0,023    | 0,075      | 1,300                   | 0,024                                                                               | 0,340      | 2,650                   | 0,011                                                                                 | 0,120      | 1,400                   |
| 12          | 48                | 0,004    | 0,075      | 1,250                   | 0,022                                                                               | 0,310      | 2,650                   | 0,011                                                                                 | 0,115      | 1,450                   |
| 13          | 52                | 0,006    | 0,085      | 1,200                   | 0,022                                                                               | 0,325      | 2,600                   | 0,025                                                                                 | 0,115      | 1,350                   |
| 14          | 56                | 0,007    | 0,070      | 1,150                   | 0,032                                                                               | 0,365      | 2,550                   | 0,091                                                                                 | 0,100      | 1,350                   |
| 15          | 60                | 0,028    | 0,075      | 1,250                   | 0,030                                                                               | 0,415      | 2,600                   | 0,061                                                                                 | 0,085      | 1,300                   |
| Rata-rata   |                   | 0,038    | 0,088      | 1,320                   | 0,024                                                                               | 0,346      | 2,590                   | 0,177                                                                                 | 0,115      | 1,520                   |
|             |                   |          |            |                         | Measured by                                                                         |            |                         |                                                                                       |            |                         |
|             |                   |          |            |                         |  |            |                         |  |            |                         |
|             |                   |          |            |                         | Jupri Yanda Zaira, ST.MT                                                            |            |                         | Agus Wijianto, ST.MT                                                                  |            |                         |

## Lampiran 2. Dokumentasin Foto Penelitian





