Diagnosis for FL01

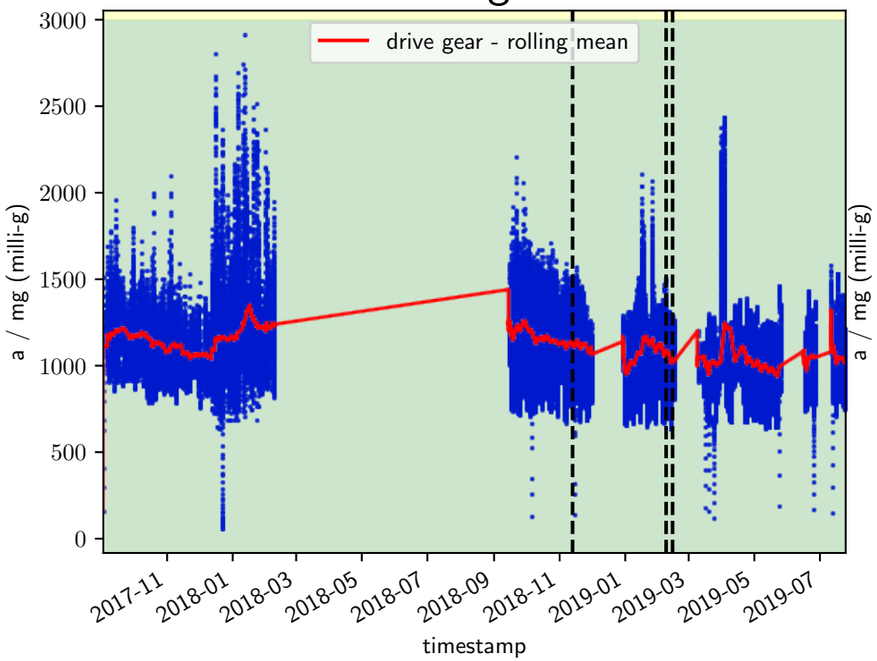
Categorization of measurements

Acceleration sensors

Time interval: all data

Acceleration sensors all data

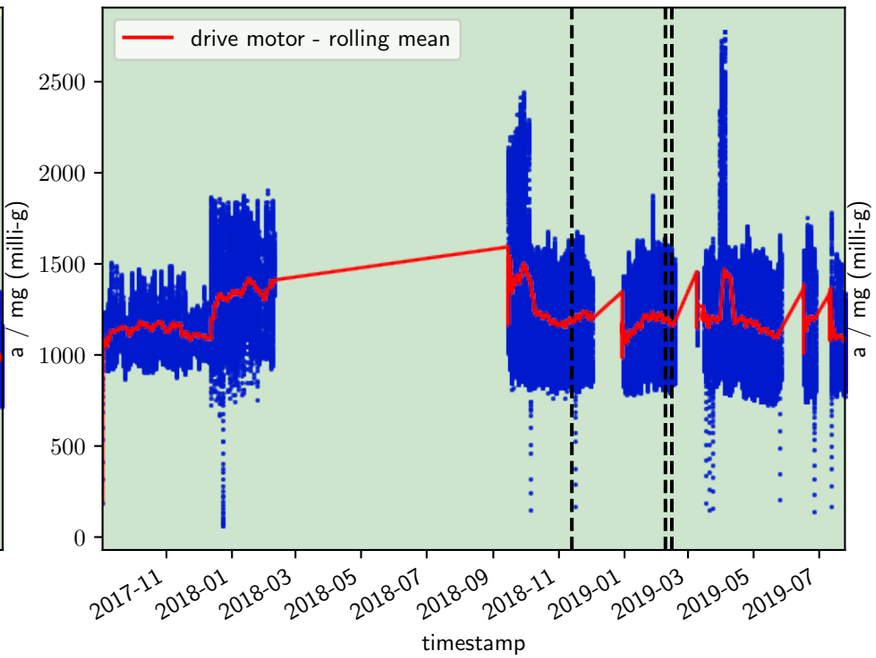
drive gear



Good: $110061/110061 = 100\%$
Satisfactory: $0/110061 = 0\%$
Unsatisfactory: $0/110061 = 0\%$
Unacceptable: $0/110061 = 0\%$

Good

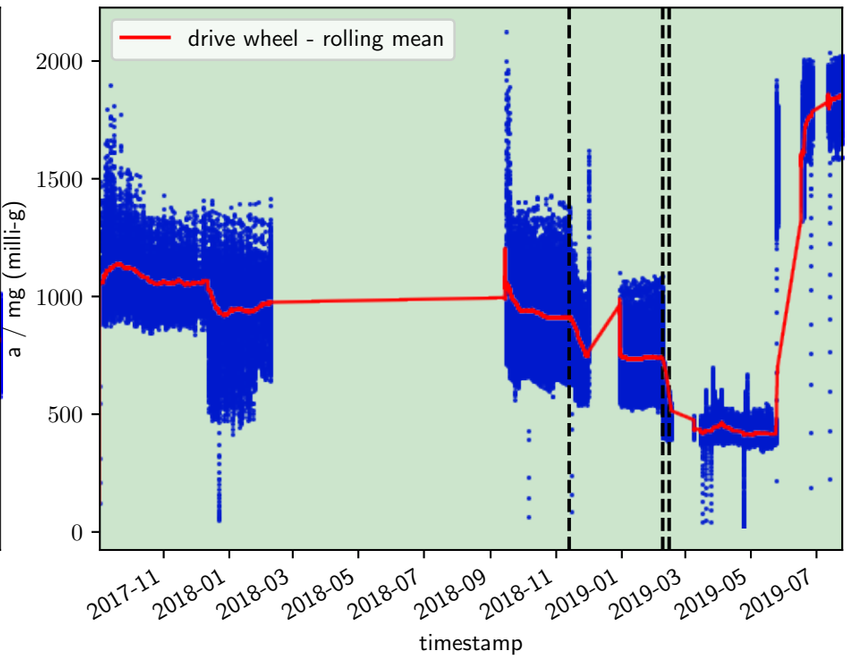
drive motor



Good: $110059/110059 = 100\%$
Satisfactory: $0/110059 = 0\%$
Unsatisfactory: $0/110059 = 0\%$
Unacceptable: $0/110059 = 0\%$

Good

drive wheel

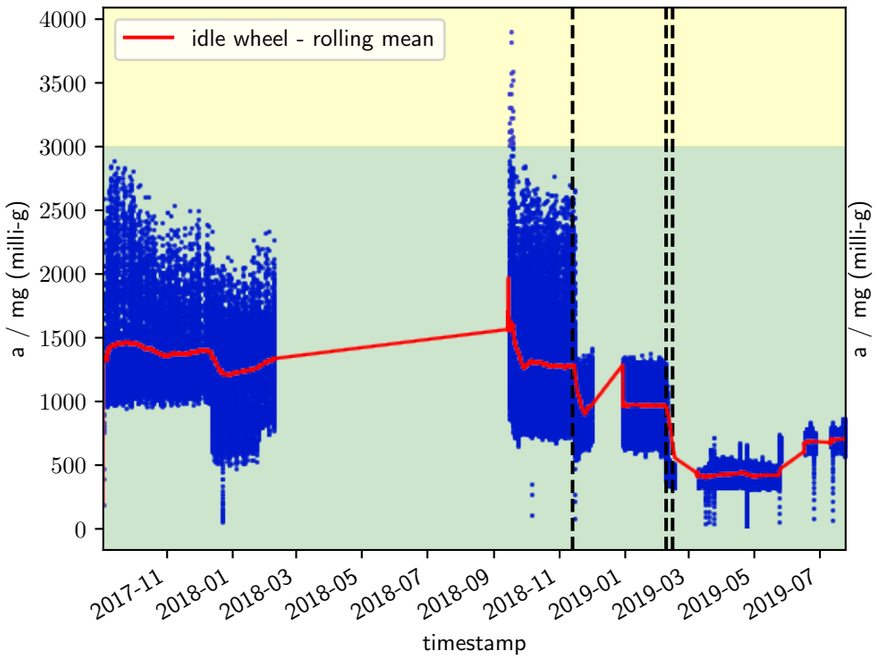


Good: $110180/110180 = 100\%$
Satisfactory: $0/110180 = 0\%$
Unsatisfactory: $0/110180 = 0\%$
Unacceptable: $0/110180 = 0\%$

Good

Acceleration sensors all data

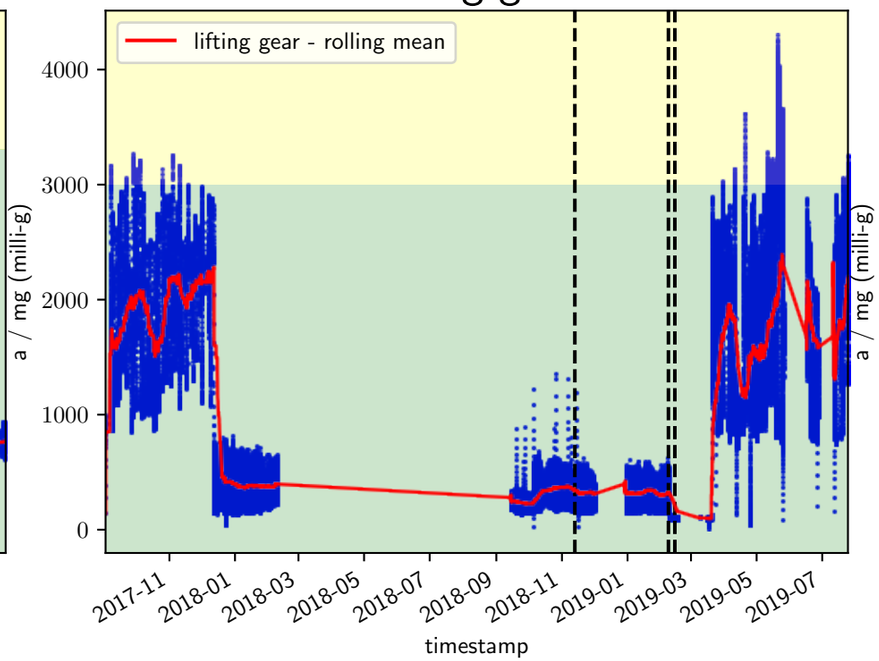
idle wheel



Good: $110152/110177 = 100\%$
Satisfactory: $25/110177 = 0\%$
Unsatisfactory: $0/110177 = 0\%$
Unacceptable: $0/110177 = 0\%$

Satisfactory

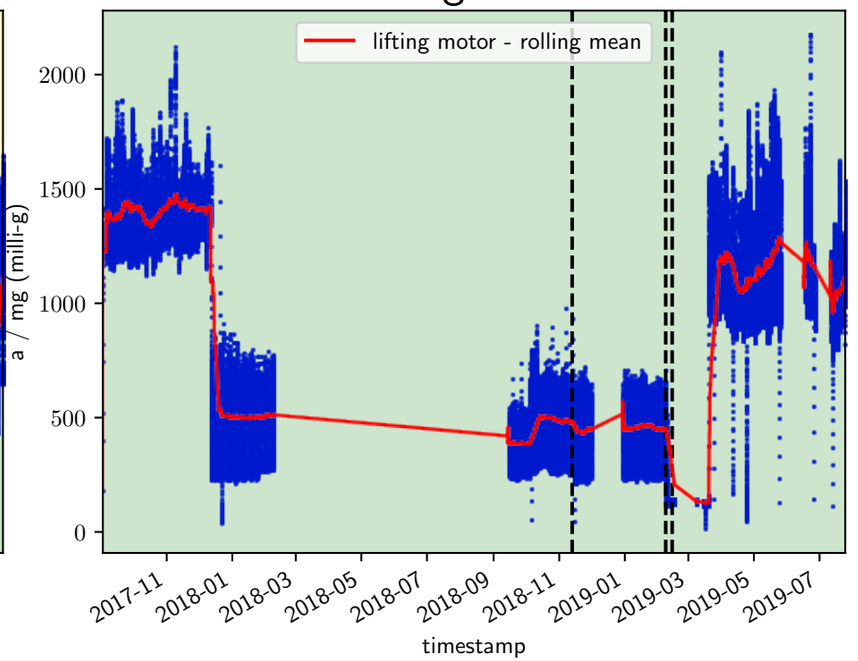
lifting gear



Good: $119218/121014 = 99\%$
Satisfactory: $1796/121014 = 1\%$
Unsatisfactory: $0/121014 = 0\%$
Unacceptable: $0/121014 = 0\%$

Satisfactory

lifting motor



Good: $121012/121012 = 100\%$
Satisfactory: $0/121012 = 0\%$
Unsatisfactory: $0/121012 = 0\%$
Unacceptable: $0/121012 = 0\%$

Good

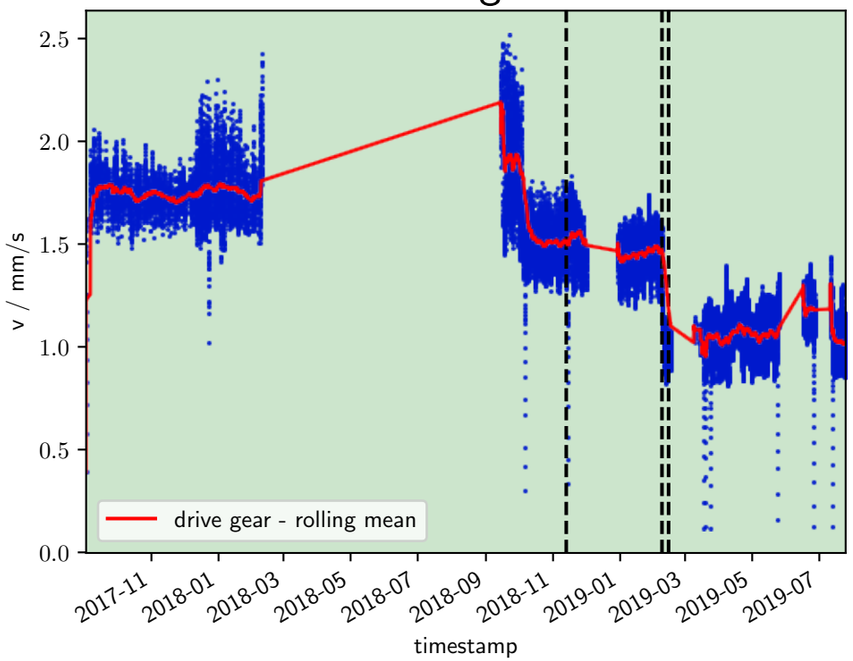
Categorization of measurements

Velocity sensors

Time interval: all data

Velocity sensors all data

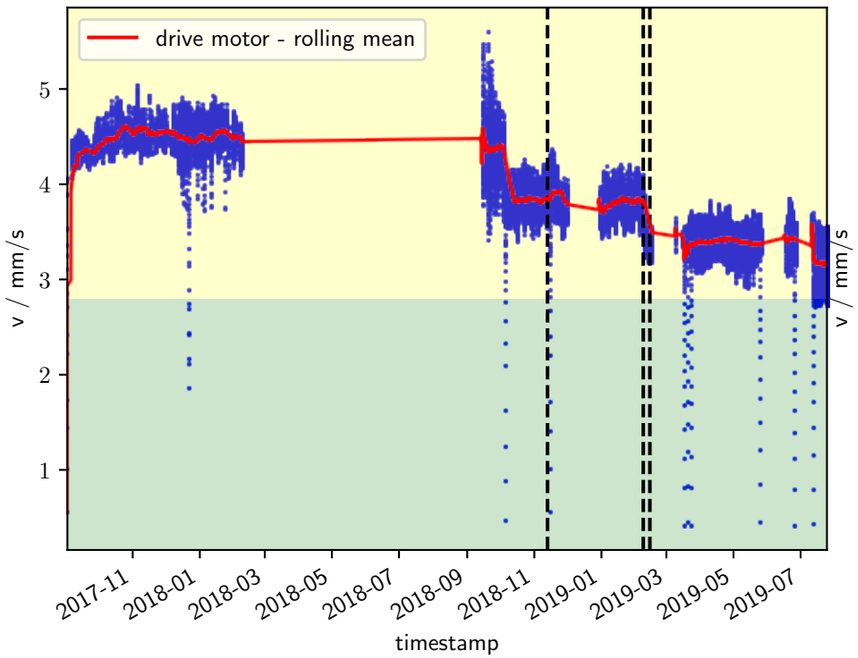
drive gear



Good: $32554/32554 = 100\%$
Satisfactory: $0/32554 = 0\%$
Unsatisfactory: $0/32554 = 0\%$
Unacceptable: $0/32554 = 0\%$

Good

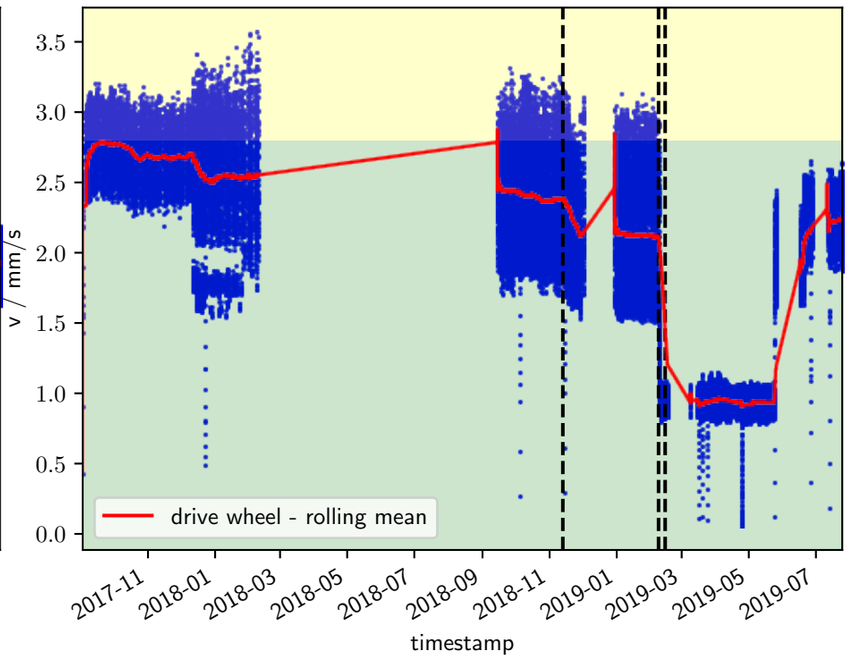
drive motor



Good: $141/33940 = 0\%$
Satisfactory: $33799/33940 = 100\%$
Unsatisfactory: $0/33940 = 0\%$
Unacceptable: $0/33940 = 0\%$

Satisfactory

drive wheel

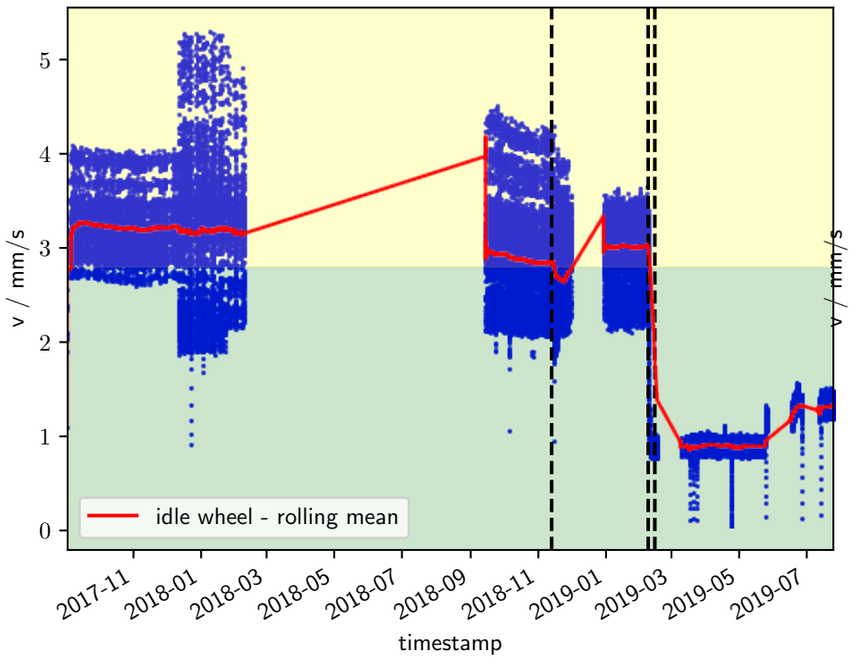


Good: $46261/51461 = 90\%$
Satisfactory: $5200/51461 = 10\%$
Unsatisfactory: $0/51461 = 0\%$
Unacceptable: $0/51461 = 0\%$

Satisfactory

Velocity sensors all data

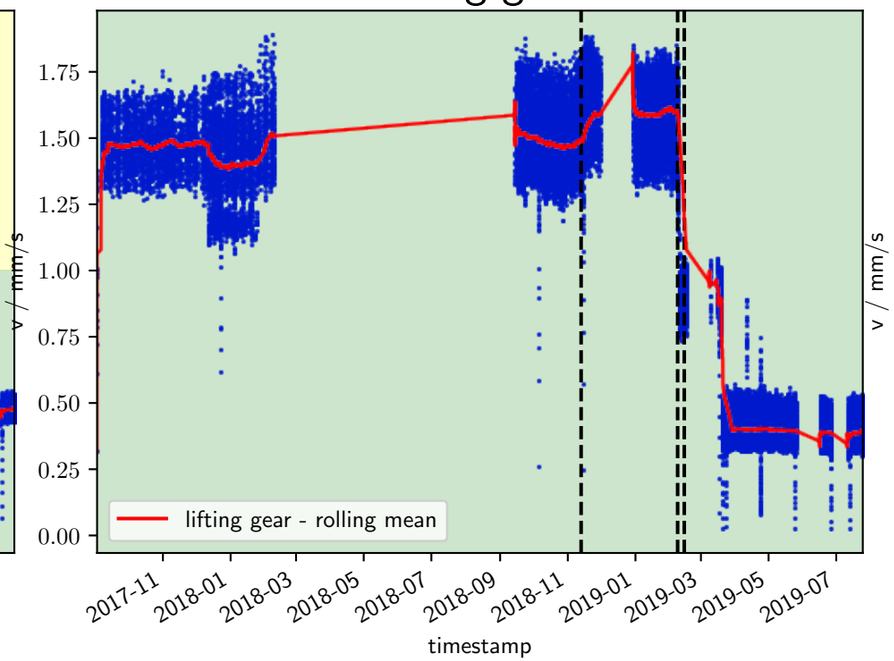
idle wheel



Good: $28222/50188 = 56\%$
Satisfactory: $21966/50188 = 44\%$
Unsatisfactory: $0/50188 = 0\%$
Unacceptable: $0/50188 = 0\%$

Satisfactory

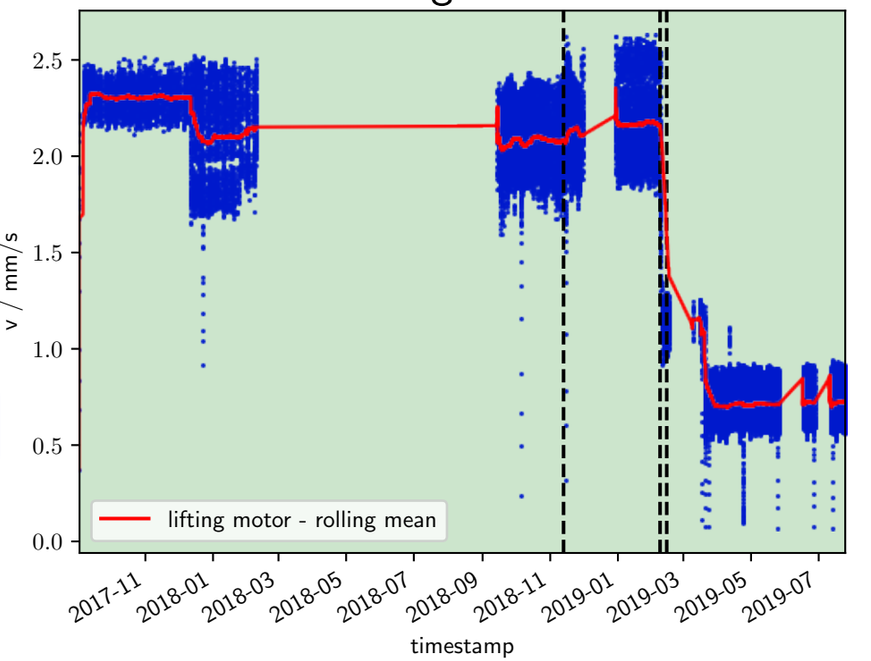
lifting gear



Good: $38446/38446 = 100\%$
Satisfactory: $0/38446 = 0\%$
Unsatisfactory: $0/38446 = 0\%$
Unacceptable: $0/38446 = 0\%$

Good

lifting motor



Good: $39163/39163 = 100\%$
Satisfactory: $0/39163 = 0\%$
Unsatisfactory: $0/39163 = 0\%$
Unacceptable: $0/39163 = 0\%$

Good

Compatibility check for velocity sensors

New data:from 2019-06-06 until 2019-07-25

Referent data: last 60 days

Velocity sensors

drive gear

$\mu_{ref} = 1.07$
$\sigma_{ref} = 0.1$
$\sigma^2_{ref} = 0.01$

$\mu_{new} = 1.1$
$\sigma_{new} = 0.12$
$\sigma^2_{new} = 0.02$

$good_{cnt}/all_{cnt}$
4409 / 4448 = 99%

GOOD FIT

drive motor

$\mu_{ref} = 3.39$
$\sigma_{ref} = 0.12$
$\sigma^2_{ref} = 0.02$

$\mu_{new} = 3.3$
$\sigma_{new} = 0.25$
$\sigma^2_{new} = 0.06$

$good_{cnt}/all_{cnt}$
3874 / 4692 = 83%

PARTIAL FIT

drive wheel

$\mu_{ref} = 0.98$
$\sigma_{ref} = 0.24$
$\sigma^2_{ref} = 0.06$

$\mu_{new} = 2.2$
$\sigma_{new} = 0.19$
$\sigma^2_{new} = 0.04$

$good_{cnt}/all_{cnt}$
55 / 4731 = 1%

BAD FIT

idle wheel

$\mu_{ref} = 0.91$
$\sigma_{ref} = 0.1$
$\sigma^2_{ref} = 0.01$

$\mu_{new} = 1.32$
$\sigma_{new} = 0.09$
$\sigma^2_{new} = 0.01$

$good_{cnt}/all_{cnt}$
224 / 4479 = 5%

BAD FIT

lifting gear

$\mu_{ref} = 0.4$
$\sigma_{ref} = 0.05$
$\sigma^2_{ref} = 0.0$

$\mu_{new} = 0.39$
$\sigma_{new} = 0.04$
$\sigma^2_{new} = 0.0$

$good_{cnt}/all_{cnt}$
5785 / 5801 = 100%

GOOD FIT

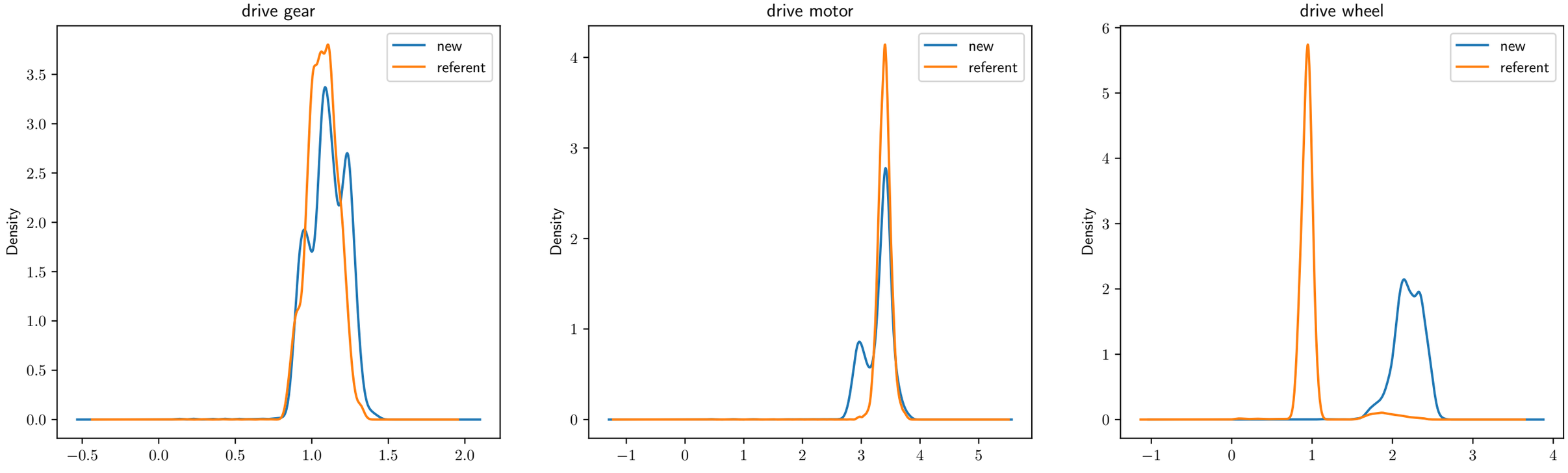
lifting motor

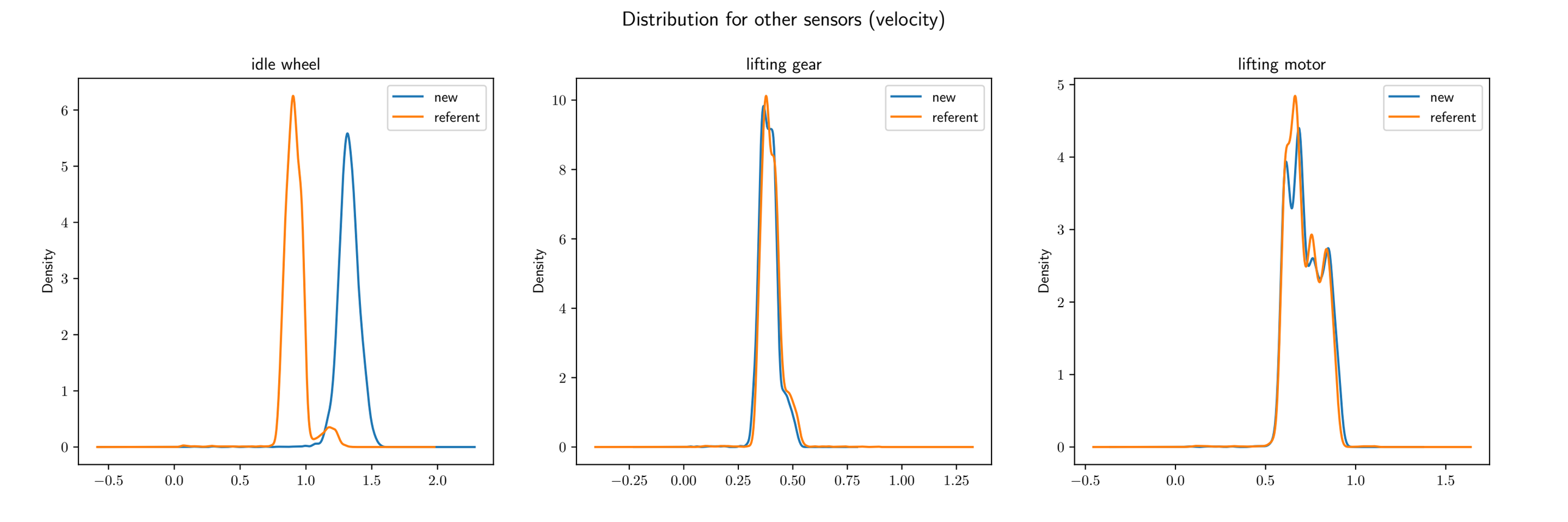
$\mu_{ref} = 0.71$
$\sigma_{ref} = 0.09$
$\sigma^2_{ref} = 0.01$

$\mu_{new} = 0.72$
$\sigma_{new} = 0.1$
$\sigma^2_{new} = 0.01$

$good_{cnt}/all_{cnt}$
5951 / 5960 = 100%

GOOD FIT


Distribution for drive sensors (velocity)
drive gear
drive motor
drive wheel
new
referent
Density
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
−0.5
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4
−1
0
1
2
3
4
5
0
1
2
3
4
5
6
−1
0
1
2
3
4


Distribution for other sensors (velocity)
idle wheel
lifting gear
lifting motor
new
referent
Density
0
1
2
3
4
5
6
8
10
−0.5
0.0
0.5
1.0
1.5
2.0
−0.25
0.00
0.25
0.50
0.75
1.00
1.25

Compatibility check for acceleration sensors

New data:from 2019-06-06 until 2019-07-25

Referent data: last 60 days

Acceleration sensors

drive gear

$\mu_{ref} = 1011.5$
$\sigma_{ref} = 145.68$
$\sigma^2_{ref} = 21222.68$

$\mu_{new} = 1037.93$
$\sigma_{new} = 144.17$
$\sigma^2_{new} = 20785.45$

$good_{cnt}/all_{cnt}$
9924 / 9992 = 99%

GOOD FIT

drive motor

$\mu_{ref} = 1152.44$
$\sigma_{ref} = 239.79$
$\sigma^2_{ref} = 57497.57$

$\mu_{new} = 1143.62$
$\sigma_{new} = 227.16$
$\sigma^2_{new} = 51600.11$

$good_{cnt}/all_{cnt}$
9985 / 9992 = 100%

GOOD FIT

drive wheel

$\mu_{ref} = 477.51$
$\sigma_{ref} = 252.95$
$\sigma^2_{ref} = 63983.63$

$\mu_{new} = 1808.57$
$\sigma_{new} = 116.83$
$\sigma^2_{new} = 13648.16$

$good_{cnt}/all_{cnt}$
16 / 9997 = 0%

BAD FIT

idle wheel

$\mu_{ref} = 436.57$
$\sigma_{ref} = 71.95$
$\sigma^2_{ref} = 5176.52$

$\mu_{new} = 696.98$
$\sigma_{new} = 41.36$
$\sigma^2_{new} = 1710.63$

$good_{cnt}/all_{cnt}$
1093 / 9997 = 11%

BAD FIT

lifting gear

$\mu_{ref} = 1684.47$
$\sigma_{ref} = 732.16$
$\sigma^2_{ref} = 536053.19$

$\mu_{new} = 1823.78$
$\sigma_{new} = 580.91$
$\sigma^2_{new} = 337459.05$

$good_{cnt}/all_{cnt}$
12972 / 12972 = 100%

GOOD FIT

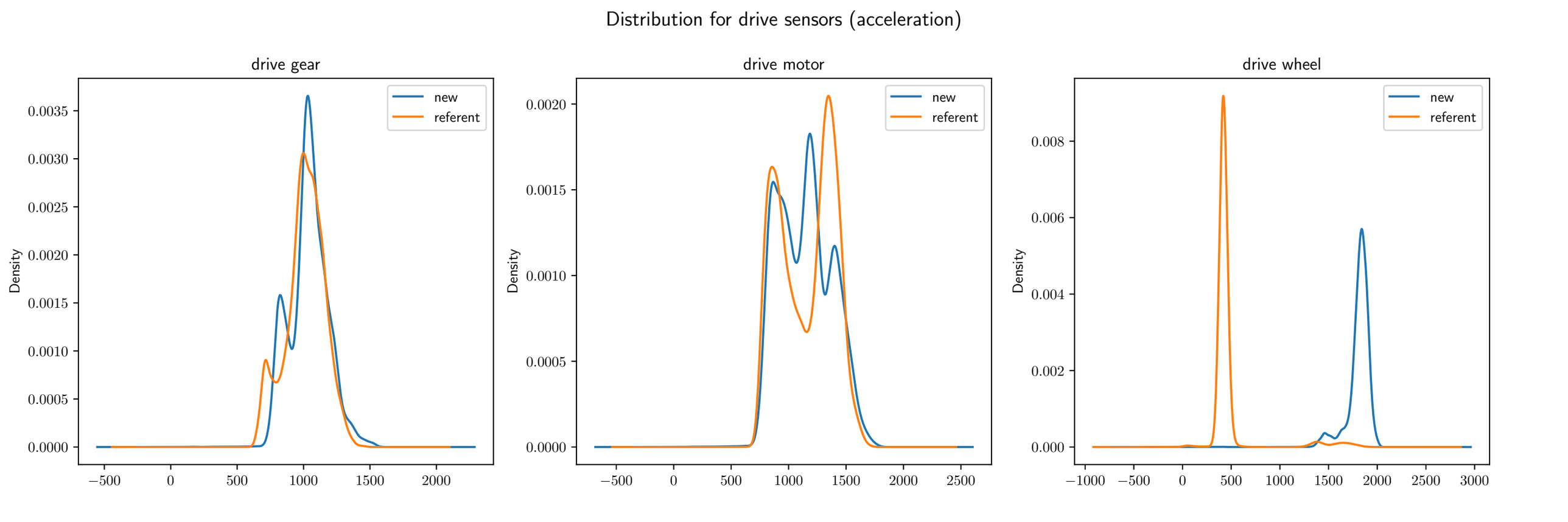
lifting motor

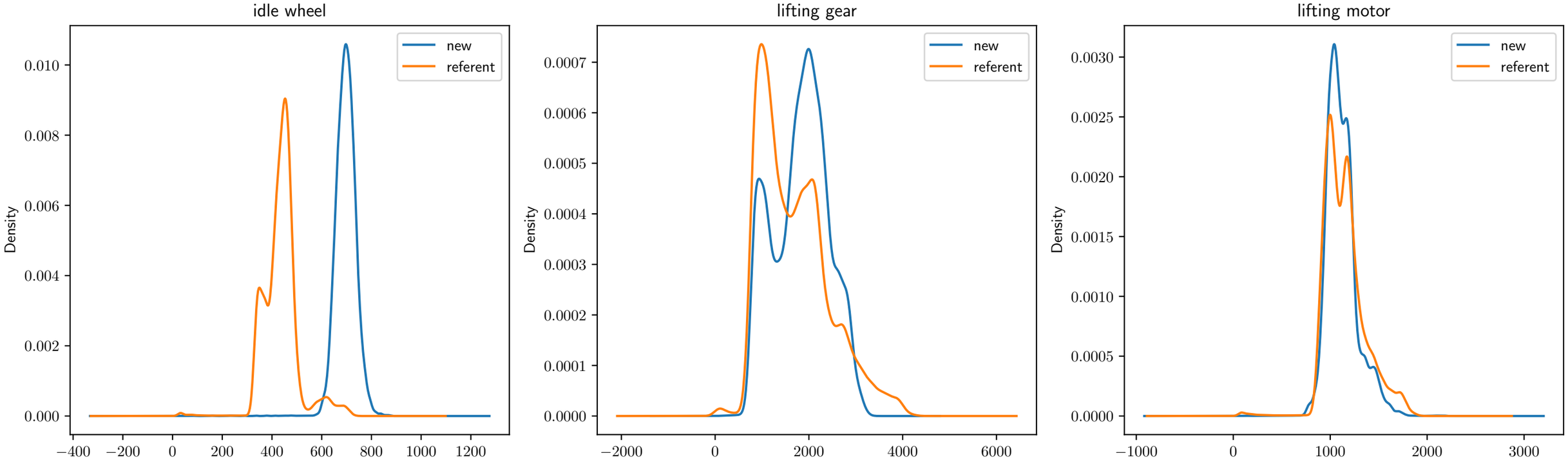
$\mu_{ref} = 1146.71$
$\sigma_{ref} = 211.98$
$\sigma^2_{ref} = 44933.75$

$\mu_{new} = 1119.91$
$\sigma_{new} = 157.44$
$\sigma^2_{new} = 24788.01$

$good_{cnt}/all_{cnt}$
12947 / 12971 = 100%

GOOD FIT


Distribution for drive sensors (acceleration)
drive gear
drive motor
drive wheel
new
referent
Density
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
0.0020
0.0015
0.0010
0.0005
0.0000
0.008
0.006
0.004
0.002
0.000
−1000
−500
0
500
1000
1500
2000
2500
3000


Distribution for other sensors (acceleration)
idle wheel
lifting gear
lifting motor
new
referent
Density
0.010
0.008
0.006
0.004
0.002
0.000
−400
−200
0
200
400
600
800
1000
1200
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0.0000
−2000
0
2000
4000
6000
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
−1000
0
1000
2000
3000