In [3]:

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
%matplotlib inline
%pprint off
plt.style.use('seaborn')
```

```
Pretty printing has been turned ON
```

In [4]:

```
df_all = pd.read_csv('data/cleaned.csv')
len(df_all)
```

Out[4]:

```
593956
```

In [5]:

```
df_all = df_all.set_index(pd.to_datetime(df_all['localminute']), drop=True)
```

In [6]:

```
df_all = df_all.drop(columns=['Unnamed: 0', 'localminute'])
```

In [7]:

```
display(df_all.head(), len(df_all))
```

	marginal_change	cumul_value	meterid
localminute			
2015-10-01 05:00:00	0.0	93470.0	35
2015-10-01 06:00:00	0.0	93470.0	35
2015-10-01 07:00:00	0.0	93470.0	35
2015-10-01 08:00:00	0.0	93470.0	35
2015-10-01 09:00:00	0.0	93470.0	35

```
593956
```

In [8]:

```
groups = df_all.groupby('meterid')
keys = groups.groups.keys()  # keys: an iterable of dataids or meter ids
```

In [9]:

```
id_list = list(keys)
id_list.remove(8703)  # meterid 8703 was found to have data for only 2 weeks in Oct.
display(id_list, len(id_list))
```

```
[35,
 44,
 77,
 94,
 114,
 187,
 222,
 252,
 370,
 483,
 484,
 661,
 739,
 744,
 871,
 1042,
 1086,
 1103,
 1185,
 1283,
 1403,
 1415,
 1507,
 1556,
 1589,
 1619,
 1697,
 1714,
 1718,
 1790,
 1791,
 1792,
 1800,
 1801,
 2018,
 2034,
 2072,
 2094,
 2129,
 2233,
 2335,
 2378,
 2449,
 2461,
 2470,
 2575,
 2638,
 2755,
 2814,
 2818,
 2945,
 2946,
 2965,
 2980,
 3036,
 3039,
 3134,
 3310,
 3367,
 3527,
 3544,
```

```
    3577,
    3635,
    3723,
    3778,
    3849,
    3893,
    3918,
    4029,
    4031,
    4193,
    4228,
    4296,
    4352,
    4356,
    4373,
    4421,
    4447,
    4514,
    4732,
    4767,
    4998,
    5129,
    5131,
    5193,
    5275,
    5317,
    5395,
    5403,
    5439,
    5484,
    5636,
    5658,
    5785,
    5810,
    5814,
    5892,
    5972,
    6412,
    6505,
    6578,
    6673,
    6685,
    6830,
    6836,
    6863,
    6910,
    7016,
    7017,
    7030,
    7117,
    7287,
    7429,
    7460,
    7674,
    7682,
    7739,
    7741,
    7794,
    7900,
    7919,
    7965,
```

```
 7989,
 8059,
 8084,
 8086,
 8155,
 8156,
 8244,
 8386,
 8467,
 8829,
 8890,
 8967,
 9052,
 9121,
 9134,
 9160,
 9278,
 9295,
 9474,
 9600,
 9631,
 9639,
 9729,
 9766,
 9849,
 9956,
 9982]
```

```
149
```

Visualize meter data.

In [10]:

```
# for i in id_list:
#     df_i = groups.get_group(i)
#     #df_i['cumul_value'].plot(figsize=(15,4), title=f'meter {i}, {len(df_i)} sample
s')
#     plt.cla()
#     fig = plt.gcf()
#     fig.set_size_inches(15,4)
#     plt.title(f'meter {i}, {len(df_i)} samples')
#     plt.scatter(x=df_i.index, y=df_i['cumul_value'])
#     plt.show()
```

In [11]:

```
# get list of meterids whose first datapoint is at least as early as pre-specified 'ori
gin_date'.
# and whose last datapoint is after some specified 'end_date'?
# the reason is to get a set of data that can be normalized and then fed as regression
 input.

origin_date = '2015-11-01'

valid_list = []
for meterid in id_list:
    df_i = groups.get_group(meterid)
    if df_i.index[0] <= pd.to_datetime(origin_date):
        valid_list.append(meterid)

display(valid_list, len(valid_list))
```

```
[35,
 44,
 77,
 94,
 114,
 187,
 222,
 252,
 370,
 483,
 484,
 661,
 739,
 744,
 871,
 1042,
 1086,
 1103,
 1185,
 1283,
 1415,
 1507,
 1556,
 1589,
 1619,
 1697,
 1714,
 1718,
 1790,
 1791,
 1792,
 1800,
 1801,
 2018,
 2034,
 2072,
 2094,
 2129,
 2233,
 2335,
 2378,
 2449,
 2461,
 2470,
 2575,
 2638,
 2818,
 2945,
 2965,
 2980,
 3039,
 3134,
 3310,
 3367,
 3527,
 3544,
 3577,
 3635,
 3723,
 3778,
 3849,
```

```
    3893,
    3918,
    4029,
    4031,
    4193,
    4228,
    4296,
    4352,
    4356,
    4373,
    4421,
    4447,
    4514,
    4732,
    4767,
    4998,
    5129,
    5131,
    5193,
    5275,
    5395,
    5403,
    5439,
    5484,
    5636,
    5785,
    5810,
    5814,
    5892,
    5972,
    6412,
    6505,
    6578,
    6685,
    6830,
    6836,
    6863,
    6910,
    7016,
    7017,
    7030,
    7117,
    7287,
    7429,
    7460,
    7674,
    7682,
    7739,
    7741,
    7794,
    7900,
    7919,
    7965,
    7989,
    8059,
    8084,
    8086,
    8155,
    8156,
    8386,
    8467,
```

```
 8829,
 8890,
 8967,
 9052,
 9121,
 9134,
 9278,
 9295,
 9474,
 9631,
 9639,
 9729,
 9766,
 9849,
 9956,
 9982]
```

```
138
```

In [12]:

```
# normalize the cumulative values before fitting the model over the values!!

def normalize_cumul(df, start_date):
    '''
    normalize the cumul values towards a common start_date.

    df: dataframe. dataframe representing one meterid's data. df must have datetimeinde
x, and 'cumul_value' column
    '''
    df1 = df.loc[df.index >= pd.to_datetime(start_date)]
    const = df1['cumul_value'].iloc[0]  # get first cumul value.
    ser_norm = df1['cumul_value'] - const
    df_new = df1.assign(norm_cumul_value=ser_norm).drop(columns=['cumul_value'])

    return df_new

df_eg = normalize_cumul(df_i, origin_date)
display(df_eg.head(10), df_eg.tail(10))
```

	marginal_change	meterid	norm_cumul_value
localminute			
2015-11-01 00:00:00	4.0	9982	0.0
2015-11-01 01:00:00	0.0	9982	0.0
2015-11-01 02:00:00	0.0	9982	0.0
2015-11-01 03:00:00	0.0	9982	0.0
2015-11-01 04:00:00	8.0	9982	8.0
2015-11-01 05:00:00	0.0	9982	8.0
2015-11-01 06:00:00	0.0	9982	8.0
2015-11-01 07:00:00	0.0	9982	8.0
2015-11-01 08:00:00	0.0	9982	8.0
2015-11-01 09:00:00	0.0	9982	8.0

	marginal_change	meterid	norm_cumul_value
localminute			
2016-03-31 07:00:00	0.0	9982	12574.0
2016-03-31 08:00:00	0.0	9982	12574.0
2016-03-31 09:00:00	0.0	9982	12574.0
2016-03-31 10:00:00	0.0	9982	12574.0
2016-03-31 11:00:00	0.0	9982	12574.0
2016-03-31 12:00:00	0.0	9982	12574.0
2016-03-31 13:00:00	0.0	9982	12574.0
2016-03-31 14:00:00	0.0	9982	12574.0
2016-03-31 15:00:00	0.0	9982	12574.0
2016-03-31 16:00:00	72.0	9982	12646.0

Aggregate/combined Linear Regression model (stuck here).

In [13]:

```
# combine all meterids' data.
# maybe create new columns for 1 hot encoding indicating which meterid the datapoint be
longs to
# it is possible to extend this model by using one-hot encoding to indicate a particula
r cluster of meterids instead.


def normalize_and_combine(origin_date):
    '''
    finds all meterids that have a datapoint at origin_date and
    normalizes all cumulative readings based on that origin_date by
    subtracting the first cumul value from all cumul values for each meterid.
    effectively setting the first cumul value to 0 at origin_date, and all subsequent
    values are based off that.

    '''
    valid_list = []
    for meterid in id_list:
        df_i = groups.get_group(meterid)
        if df_i.index[0] <= pd.to_datetime(origin_date):
            valid_list.append(meterid)

    df_combinedxy = pd.DataFrame()
    for meterid in valid_list:
        df_i = groups.get_group(meterid)
        df_i = normalize_cumul(df_i, origin_date)
        df_i = df_i.reset_index()
        df_combinedxy = df_combinedxy.append(df_i, ignore_index=True)

    return df_combinedxy

df_normalized = normalize_and_combine(origin_date)
display(df_normalized.head(), df_normalized.tail(), df_normalized.describe())
```

	localminute	marginal_change	meterid	norm_cumul_value
0	2015-11-01 00:00:00	0.0	35	0.0
1	2015-11-01 01:00:00	12.0	35	12.0
2	2015-11-01 02:00:00	0.0	35	12.0
3	2015-11-01 03:00:00	2.0	35	14.0
4	2015-11-01 04:00:00	0.0	35	14.0

	localminute	marginal_change	meterid	norm_cumul_value
490048	2016-03-31 12:00:00	0.0	9982	12574.0
490049	2016-03-31 13:00:00	0.0	9982	12574.0
490050	2016-03-31 14:00:00	0.0	9982	12574.0
490051	2016-03-31 15:00:00	0.0	9982	12574.0
490052	2016-03-31 16:00:00	72.0	9982	12646.0

	marginal_change	meterid	norm_cumul_value
count	490053.000000	490053.000000	490053.000000
mean	5.109978	4633.380975	9437.259582
std	17.900346	2930.912281	8410.615437
min	0.000000	35.000000	0.000000
25%	0.000000	2034.000000	2548.000000
50%	0.000000	4352.000000	7658.000000
75%	2.000000	7287.000000	14500.000000
max	1640.000000	9982.000000	55700.000000

In [14]:

```
# Label encoding
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
labels = le.fit_transform(df_normalized['meterid'])
display(labels, len(labels))

df_normalized = df_normalized.assign(label=labels)
df_normalized.head()
```

```
array([  0,   0,   0, ..., 137, 137, 137], dtype=int64)
```

```
490053
```

Out[14]:

	localminute	marginal_change	meterid	norm_cumul_value	label
0	2015-11-01 00:00:00	0.0	35	0.0	0
1	2015-11-01 01:00:00	12.0	35	12.0	0
2	2015-11-01 02:00:00	0.0	35	12.0	0
3	2015-11-01 03:00:00	2.0	35	14.0	0
4	2015-11-01 04:00:00	0.0	35	14.0	0

In [15]:

```
from sklearn.linear_model import LinearRegression
```

In [16]:

```
# split dataset into train, val, test (how?)
# normalize cumul values?
# lr_model.fit(x, y)
# score on train set
# score on test set
# plot timeseries of actual value and timeseries of predicted value on same plot
# is this for each meter? or how do we generate a set of actual values representing all
meters?
# plot predicted value vs actual value. plot predicted value = actual value. analyse va
riance and bias.

"""
if predicting an average consumption pattern, then x and y axis must be normalized.
maybe normalize each meterid's y data by subtracting all cumul_values by the first cumu
l_value.
the model then predicts the change from the first available datapoint.
!UNCLEAR how to normalize x axis.
"""

"""
since different households (HH) have different consumption patterns, with some HH's con
sumption patterns being quite
correlated with other HHs, it might be good to fit different models for each of these
 'clusters'.
That way, we can get higher prediction accuracy for specific HHs in each cluster.
Can we clearly identify different clusters from the corr analysis done in Part 1?
"""

# repeat above using SVR, tune parameters with validation dataset.
```

Out[16]:

```
"\nsince different households (HH) have different consumption patterns, wi
th some HH's consumption patterns being quite \ncorrelated with other HHs,
it might be good to fit different models for each of these 'clusters'.\nTh
at way, we can get higher prediction accuracy for specific HHs in each clu
ster.\nCan we clearly identify different clusters from the corr analysis d
one in Part 1?\n"
```

Linear Regression model for one meterid.

In [17]:

```
meterid = 44
df_i = groups.get_group(meterid)
df_i.head()
```

Out[17]:

	marginal_change	cumul_value	meterid
localminute			
2015-10-12 23:00:00	0.0	165674.0	44
2015-10-13 00:00:00	0.0	165674.0	44
2015-10-13 01:00:00	0.0	165674.0	44
2015-10-13 02:00:00	10.0	165684.0	44
2015-10-13 03:00:00	0.0	165684.0	44

In [18]:

```
lr_model = LinearRegression()

# convert DateTimeIndex to numerical values for regression.
# each hour is now denoted by an integer.
X = np.arange(start=0, stop=len(df_i.index), step=1).reshape(-1, 1)

y = df_i['cumul_value']
# should we shift y axis down by first cumul value? more meaningful? can more easily co
mpare across meterids?
```

In [19]:

```
# split dataset

valid_start, test_start = int(len(df_i)*0.7), int(len(df_i)*0.8)
x_train, x_valid, x_test = X[:valid_start,:], X[valid_start:test_start,:], X[test_start
:,:]
y_train, y_valid, y_test = y[:valid_start], y[valid_start:test_start], y[test_start:]
```

In [20]:

```
lr_model.fit(x_train, y_train)
```

Out[20]:

```
LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=F
alse)
```

In [21]:

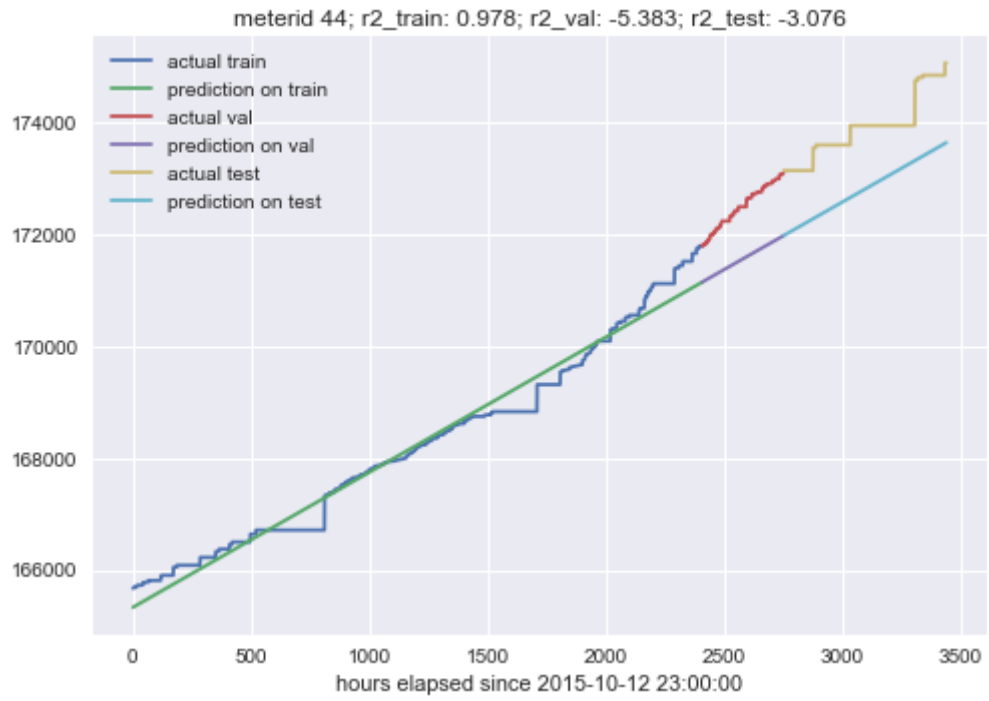
```
# run predictions and get scores

y_train_pred = lr_model.predict(x_train)
r2_train = lr_model.score(x_train, y_train)

y_valid_pred = lr_model.predict(x_valid)
r2_valid = lr_model.score(x_valid, y_valid)

y_test_pred = lr_model.predict(x_test)
r2_test = lr_model.score(x_test, y_test)
```

In [22]:

```
# plot results

plt.title(f'meterid {meterid}; r2_train: {r2_train:.3f}; r2_val: {r2_valid:.3f}; r2_tes
t: {r2_test:.3f}')
plt.xlabel(f'hours elapsed since {df_i.index[0]}')
plt.plot(x_train, y_train, label='actual train')
plt.plot(x_train, y_train_pred, label='prediction on train')

plt.plot(x_valid, y_valid, label='actual val')
plt.plot(x_valid, y_valid_pred, label='prediction on val')

plt.plot(x_test, y_test, label='actual test')
plt.plot(x_test, y_test_pred, label='prediction on test')

plt.legend()
```

Out[22]:

```
<matplotlib.legend.Legend at 0x22349af8080>
```

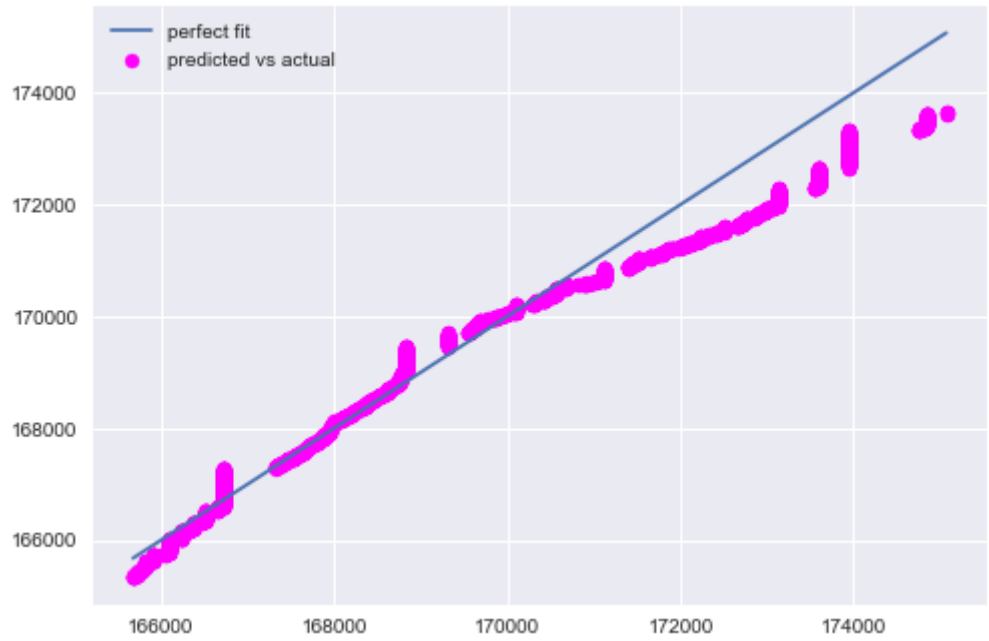


In [23]:

```
# plot actual vs predicted value
actual = []
actual.extend(y_train)
actual.extend(y_valid)
actual.extend(y_test)
len(actual)

predicted = []
predicted.extend(y_train_pred)
predicted.extend(y_valid_pred)
predicted.extend(y_test_pred)
len(predicted)

plt.scatter(actual, predicted, color='magenta', label='predicted vs actual')
plt.plot(actual, actual, label='perfect fit')
plt.legend()
```

Out[23]:

```
<matplotlib.legend.Legend at 0x22349bde128>
```



Combined code

In [51]:

```
from joblib import dump, load

origin_date = '2015-11-01' # starting date to normalize x axis (time in hours) to.

df_normalized = normalize_and_combine(origin_date)
display(df_normalized.head(), df_normalized.tail(), df_normalized.describe())

le = LabelEncoder()
labels = le.fit_transform(df_normalized['meterid'])
df_normalized = df_normalized.assign(label=labels)
display(df_normalized.head())

new_groups = df_normalized.groupby('meterid')
new_keys = new_groups.groups.keys()  # keys: an iterable of dataids or meter ids

new_id_list = list(new_keys)
display(len(new_id_list))

for meterid in new_id_list:
    df_i = new_groups.get_group(meterid)

    # convert DateTimeIndex to numerical values (ints) for regression.
    X = np.arange(start=0, stop=len(df_i.index), step=1).reshape(-1, 1)
    y = df_i['norm_cumul_value']

    # split dataset
    valid_start, test_start = int(len(df_i)*0.8), int(len(df_i)*0.9)
    x_train, x_valid, x_test = X[:valid_start,:], X[valid_start:test_start,:], X[test_s
tart:,:]
    y_train, y_valid, y_test = y[:valid_start], y[valid_start:test_start], y[test_start
:]

    lr_model.fit(x_train, y_train)
    dump(lr_model, f'models/lr_{meterid}.joblib') # save model to hard disk.

    # run predictions and get scores
    y_train_pred = lr_model.predict(x_train)
    r2_train = lr_model.score(x_train, y_train)

    y_valid_pred = lr_model.predict(x_valid)
    r2_valid = lr_model.score(x_valid, y_valid)

    y_test_pred = lr_model.predict(x_test)
    r2_test = lr_model.score(x_test, y_test)

    # plot line demarcating end of training data.
    test_mark = X[valid_start][0]
    plt.plot([test_mark, test_mark], [y_train_pred.min(), y_test_pred.max()], 'k-')

    # plot trendline and actual line.
    plt.title(f'meterid {meterid}; r2_train: {r2_train:.3f}; r2_val: {r2_valid:.3f}; r2
_test: {r2_test:.3f}')
    plt.xlabel(f'hours elapsed since {df_i.localminute.iloc[0]}')
    plt.plot(x_train, y_train, label='actual train')
    plt.plot(x_train, y_train_pred, label='prediction on train')

    plt.plot(x_valid, y_valid, label='actual val')
    plt.plot(x_valid, y_valid_pred, label='prediction on val')
```

```
plt.plot(x_test, y_test, label='actual test')
plt.plot(x_test, y_test_pred, label='prediction on test')

plt.legend()
plt.show()
plt.cla()

# plot prediction error plot (actual vs predicted value)
actual = []
actual.extend(y_train)
actual.extend(y_valid)
actual.extend(y_test)
len(actual)

predicted = []
predicted.extend(y_train_pred)
predicted.extend(y_valid_pred)
predicted.extend(y_test_pred)
len(predicted)

plt.scatter(actual, predicted, color='magenta', label='predicted vs actual')
plt.plot(actual, actual, label='perfect fit')
plt.legend()

plt.show()
plt.cla()
```

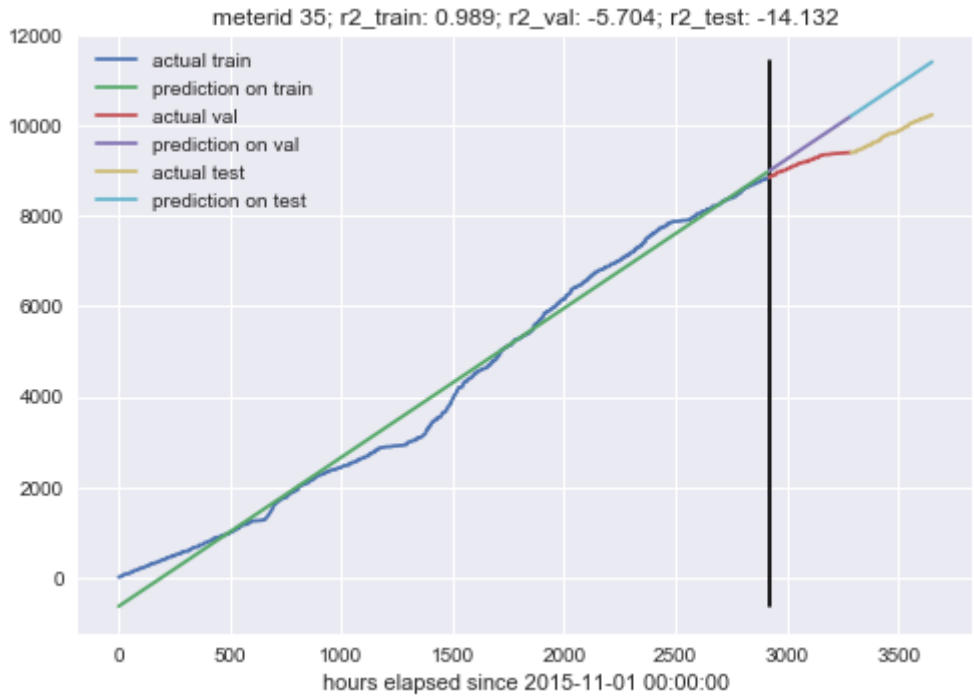
	localminute	marginal_change	meterid	norm_cumul_value
0	2015-11-01 00:00:00	0.0	35	0.0
1	2015-11-01 01:00:00	12.0	35	12.0
2	2015-11-01 02:00:00	0.0	35	12.0
3	2015-11-01 03:00:00	2.0	35	14.0
4	2015-11-01 04:00:00	0.0	35	14.0

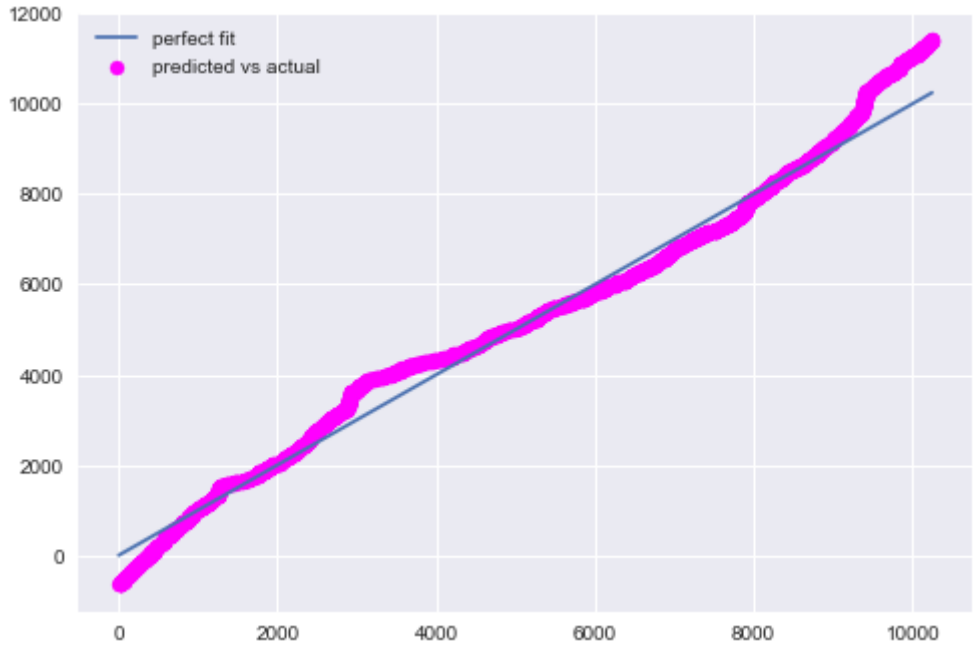
	localminute	marginal_change	meterid	norm_cumul_value
490048	2016-03-31 12:00:00	0.0	9982	12574.0
490049	2016-03-31 13:00:00	0.0	9982	12574.0
490050	2016-03-31 14:00:00	0.0	9982	12574.0
490051	2016-03-31 15:00:00	0.0	9982	12574.0
490052	2016-03-31 16:00:00	72.0	9982	12646.0

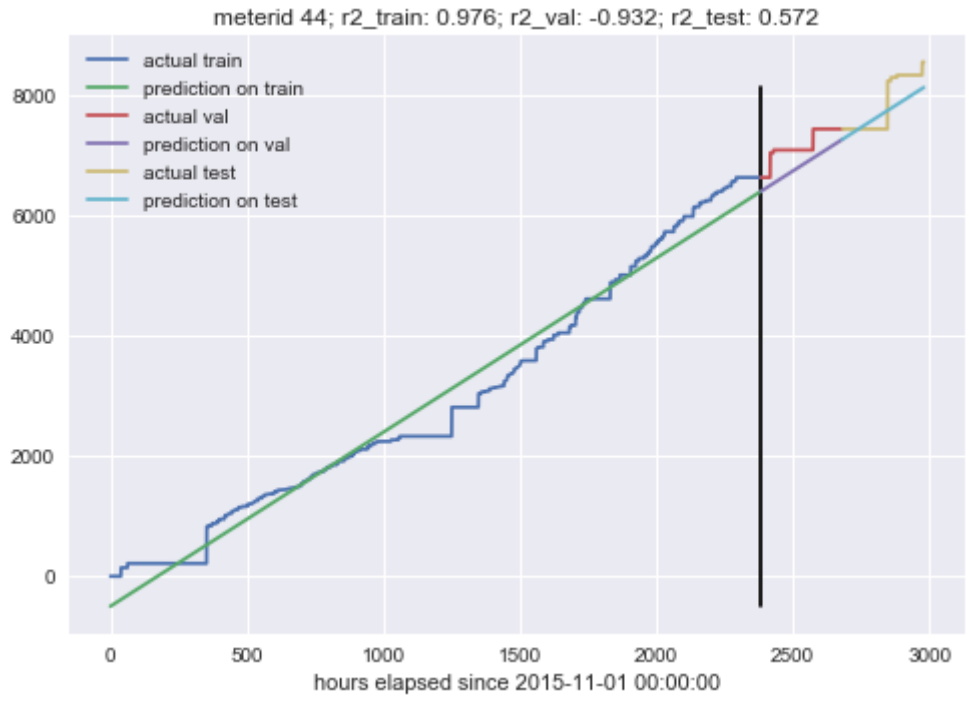
	marginal_change	meterid	norm_cumul_value
count	490053.000000	490053.000000	490053.000000
mean	5.109978	4633.380975	9437.259582
std	17.900346	2930.912281	8410.615437
min	0.000000	35.000000	0.000000
25%	0.000000	2034.000000	2548.000000
50%	0.000000	4352.000000	7658.000000
75%	2.000000	7287.000000	14500.000000
max	1640.000000	9982.000000	55700.000000

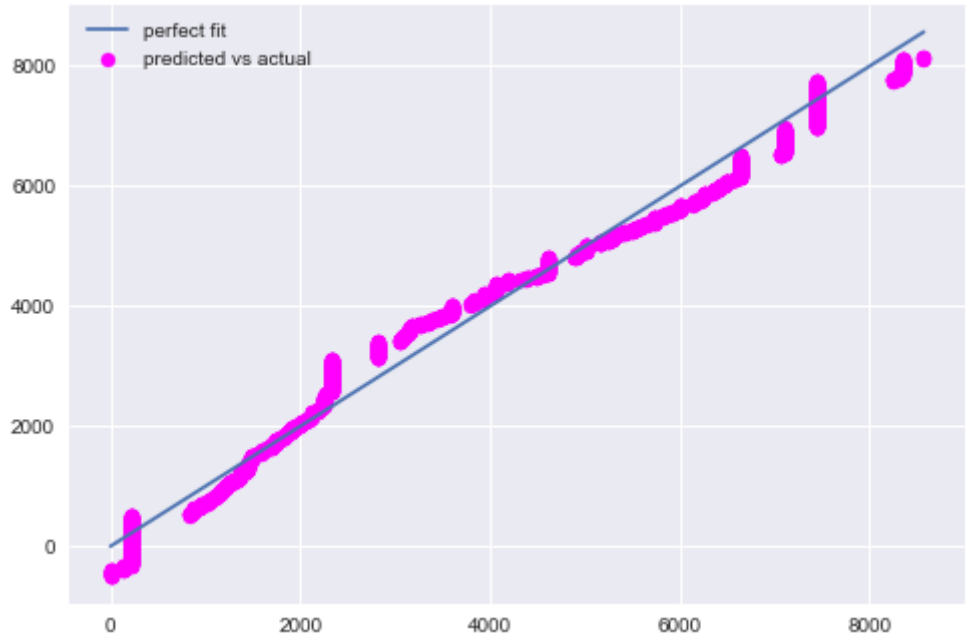
	localminute	marginal_change	meterid	norm_cumul_value	label
0	2015-11-01 00:00:00	0.0	35	0.0	0
1	2015-11-01 01:00:00	12.0	35	12.0	0
2	2015-11-01 02:00:00	0.0	35	12.0	0
3	2015-11-01 03:00:00	2.0	35	14.0	0
4	2015-11-01 04:00:00	0.0	35	14.0	0

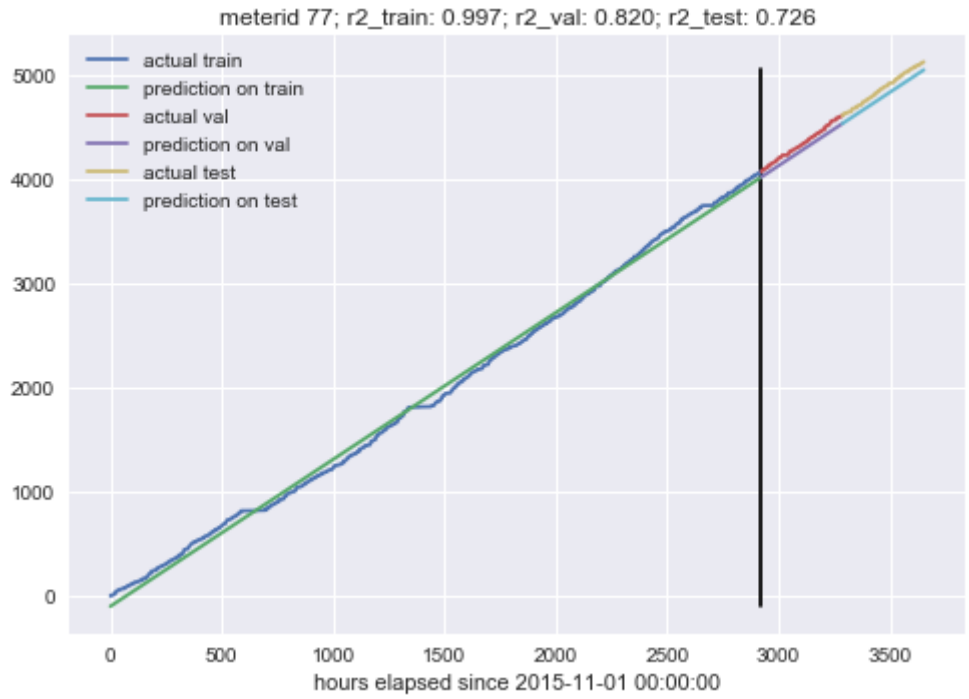
138

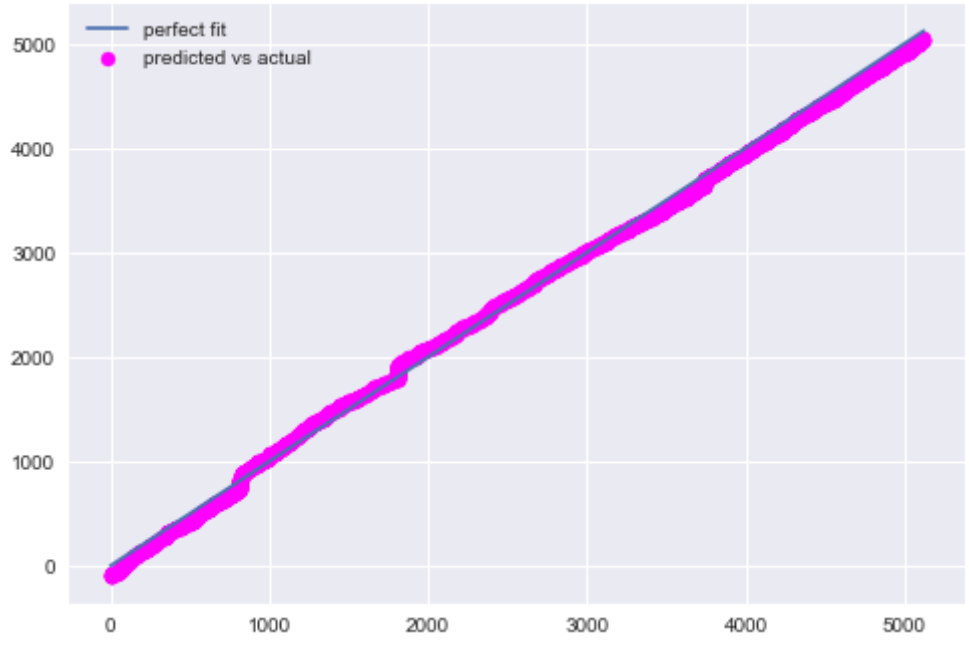

meterid 35; r2_train: 0.989; r2_val: -5.704; r2_test: -14.132
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

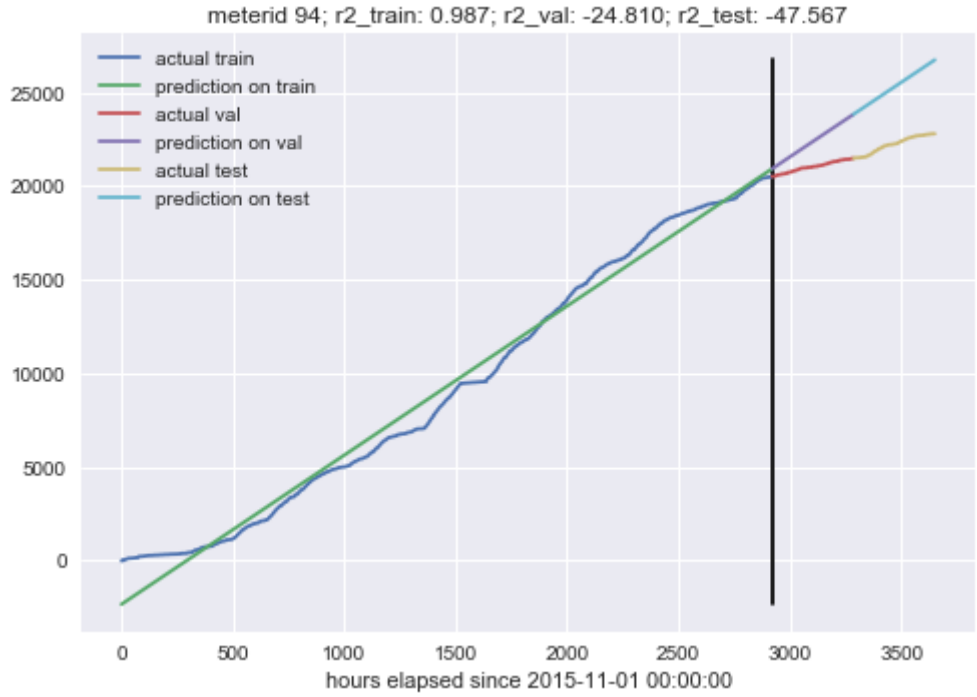

perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000

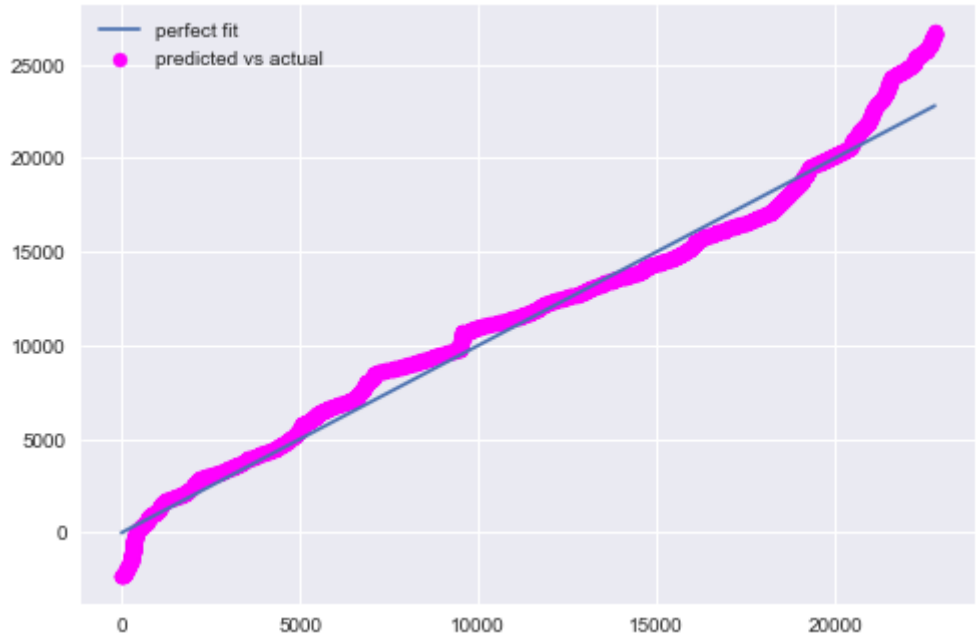

meterid 44; r2_train: 0.976; r2_val: -0.932; r2_test: 0.572
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

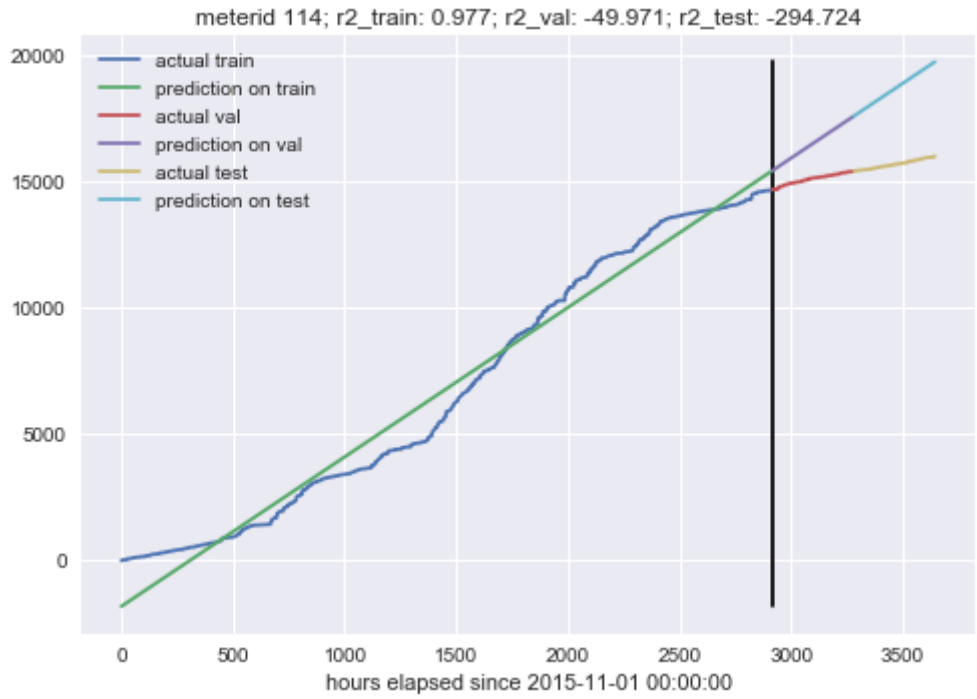

perfect fit
predicted vs actual
8000
6000
4000
2000
0
0
2000
4000
6000
8000

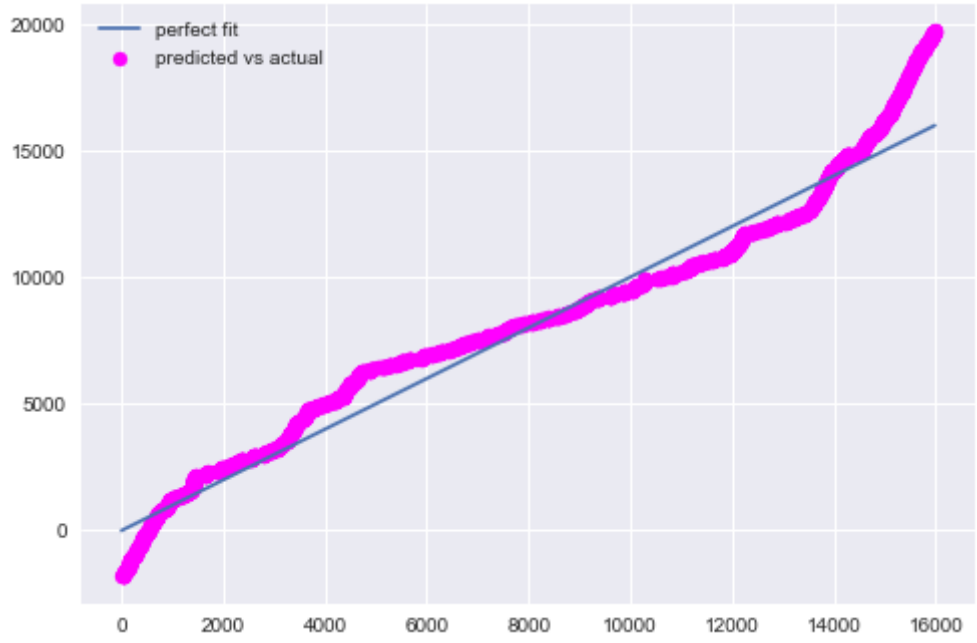

meterid 77; r2_train: 0.997; r2_val: 0.820; r2_test: 0.726
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

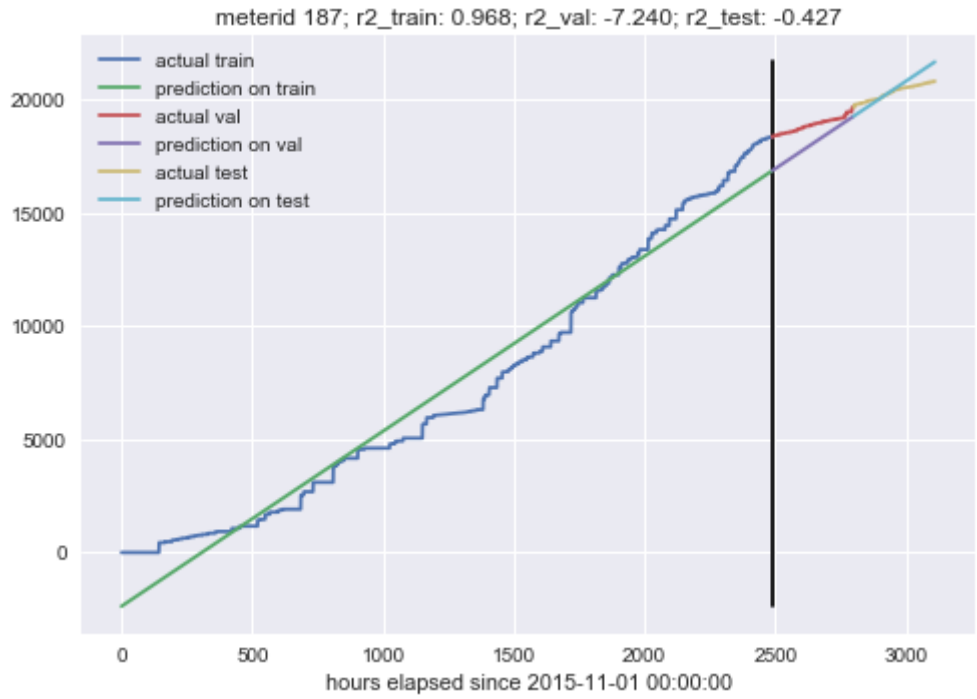

perfect fit
predicted vs actual
5000
4000
3000
2000
1000
0
0
1000
2000
3000
4000
5000

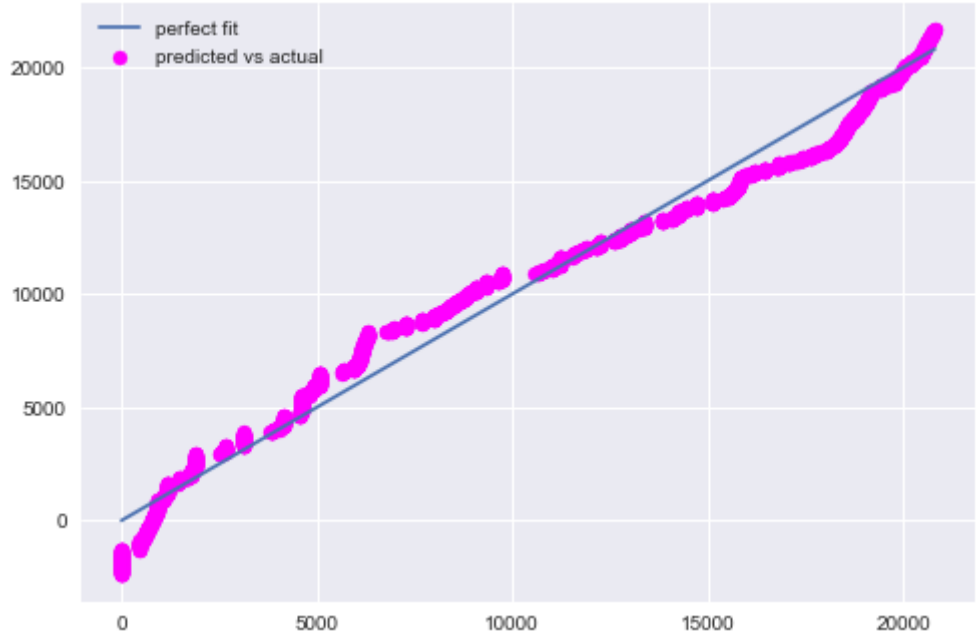

meterid 94; r2_train: 0.987; r2_val: -24.810; r2_test: -47.567
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

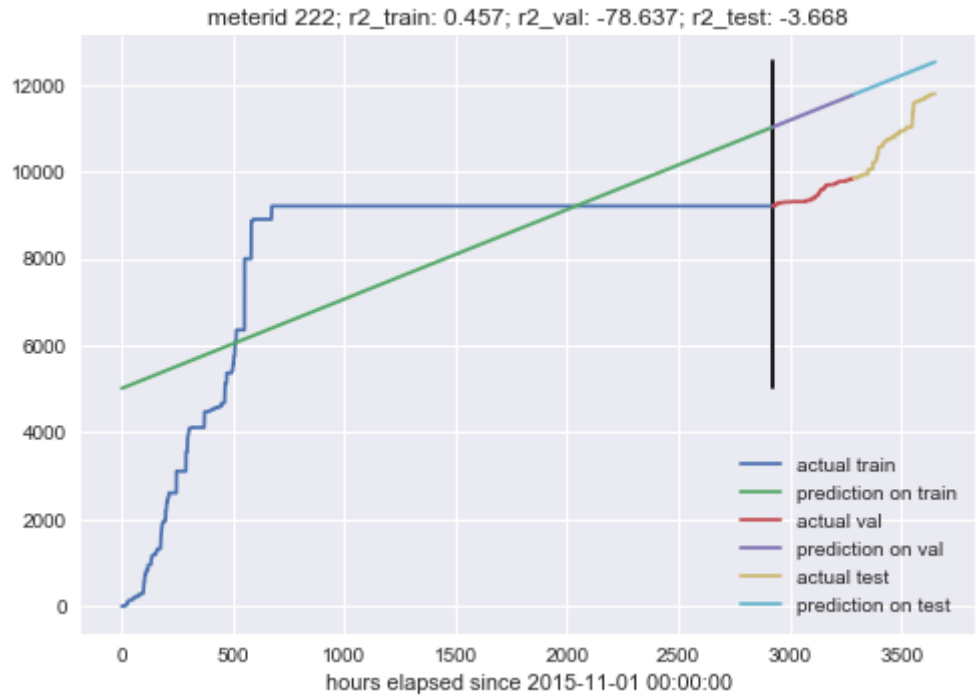

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

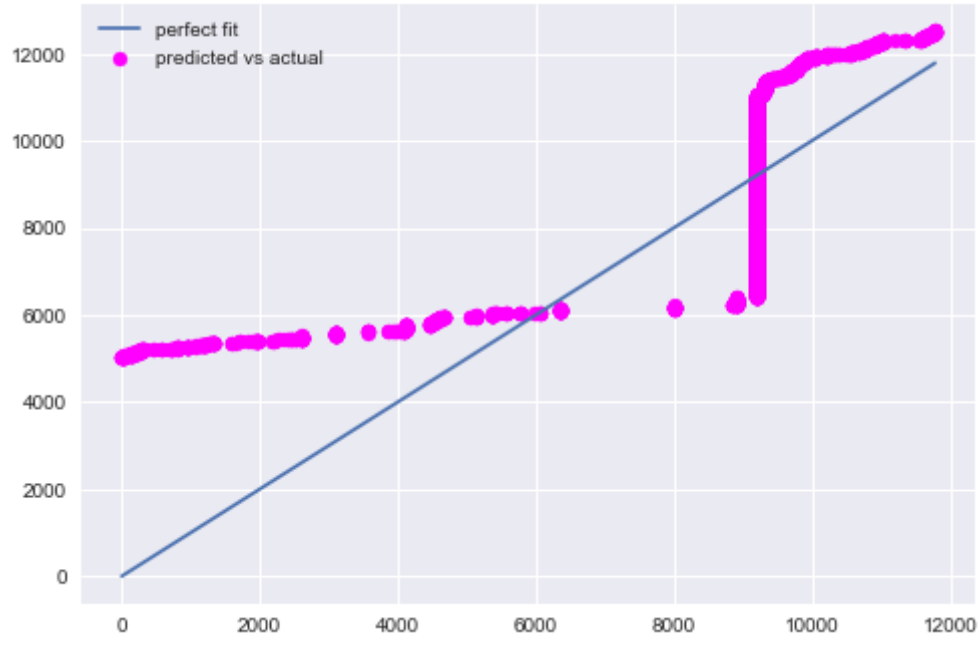

meterid 114; r2_train: 0.977; r2_val: -49.971; r2_test: -294.724
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

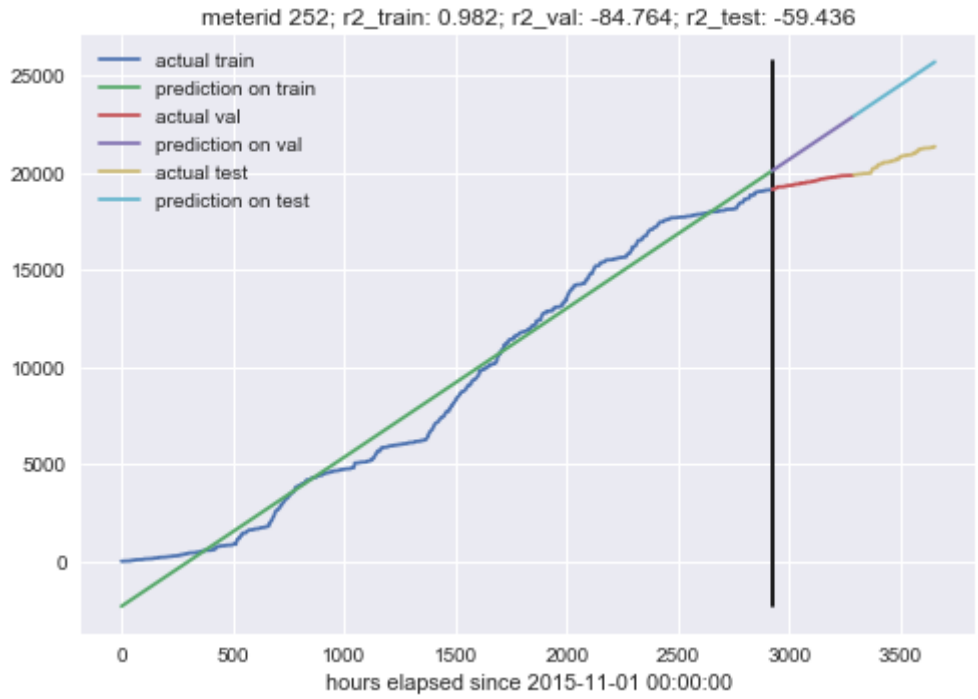

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000
16000

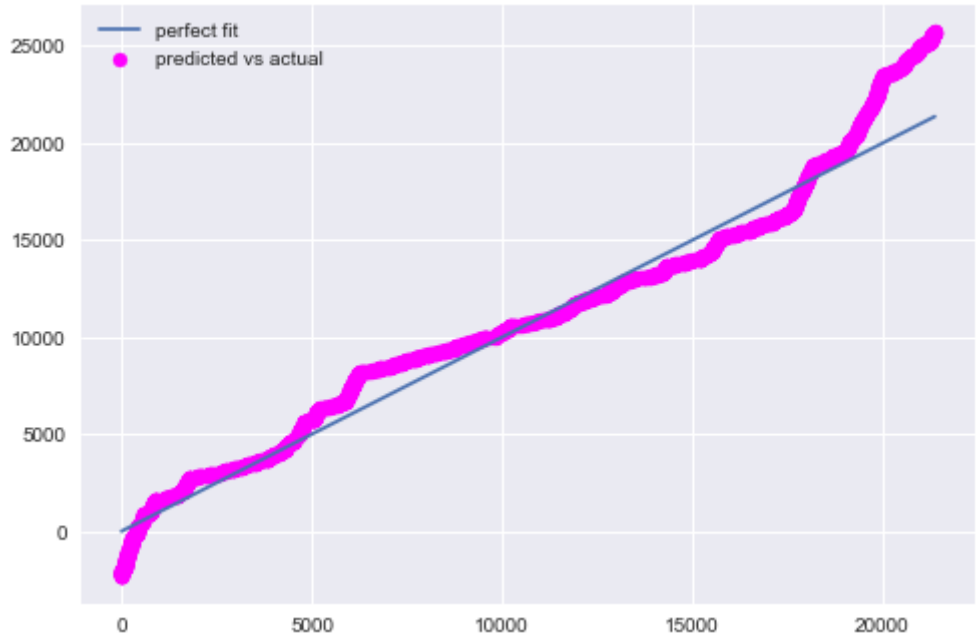

meterid 187; r2_train: 0.968; r2_val: -7.240; r2_test: -0.427
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

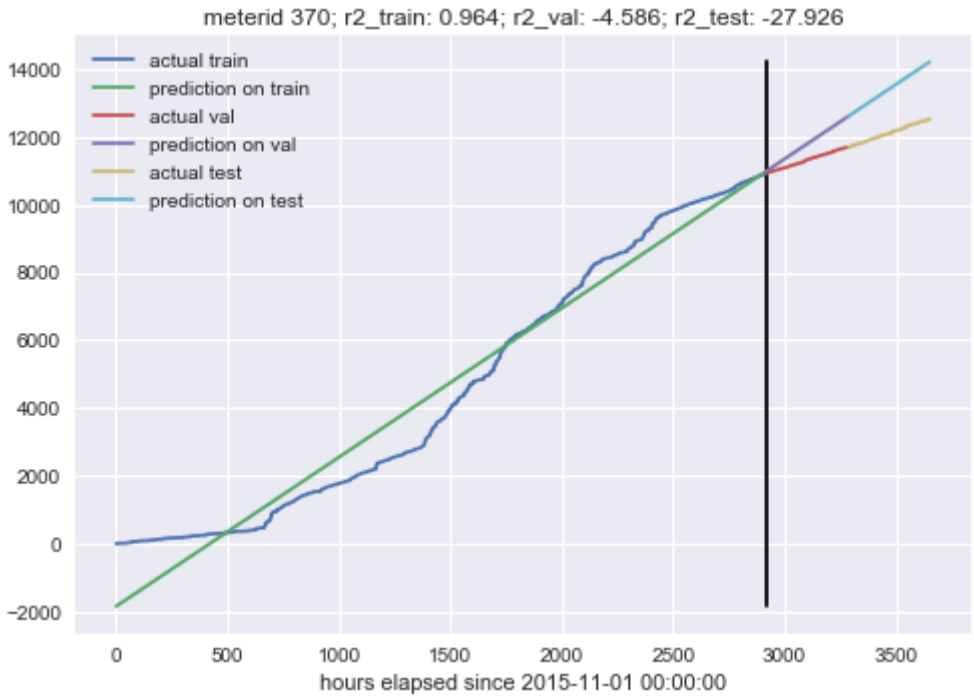

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
5000
10000
15000
20000

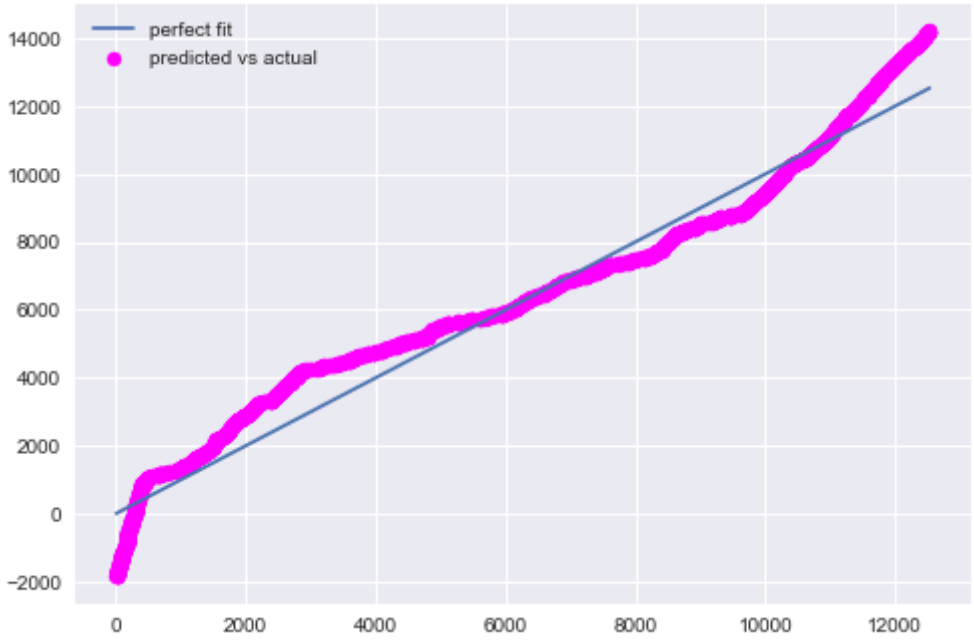

meterid 222; r2_train: 0.457; r2_val: -78.637; r2_test: -3.668
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test

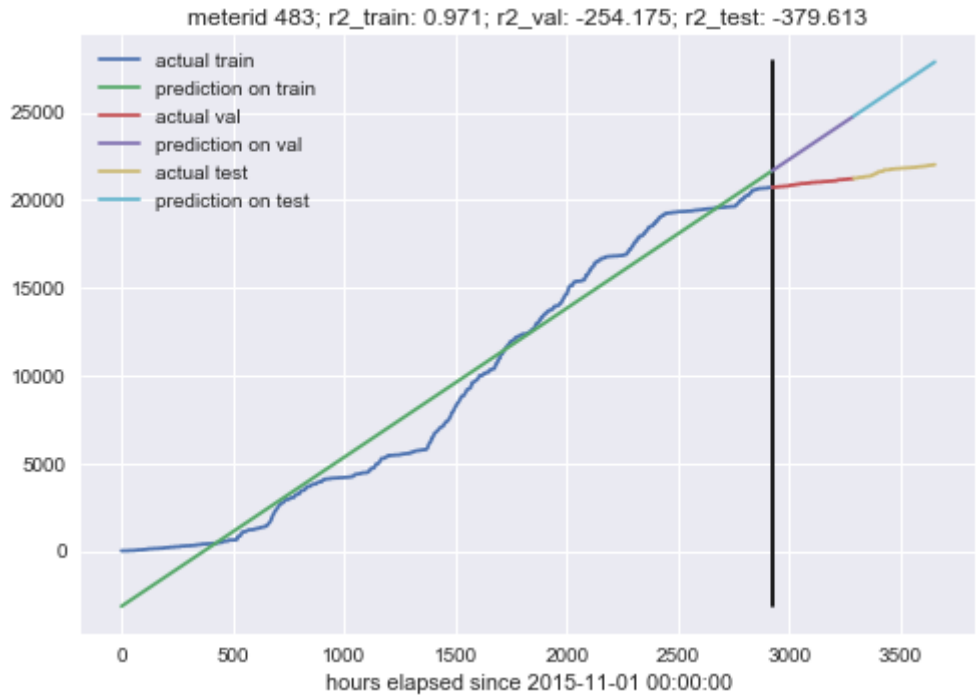

perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000
12000

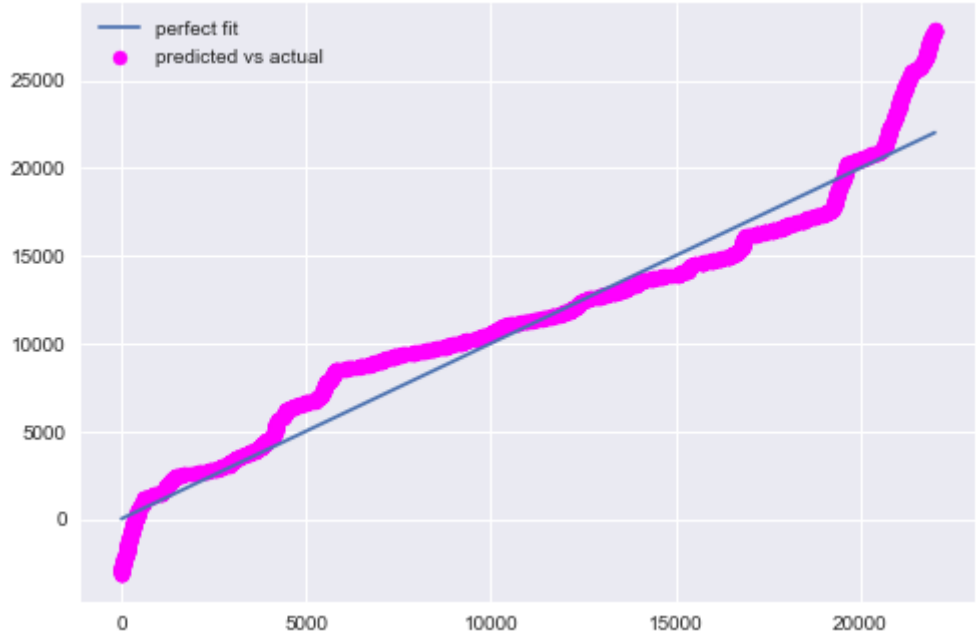

meterid 252; r2_train: 0.982; r2_val: -84.764; r2_test: -59.436
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

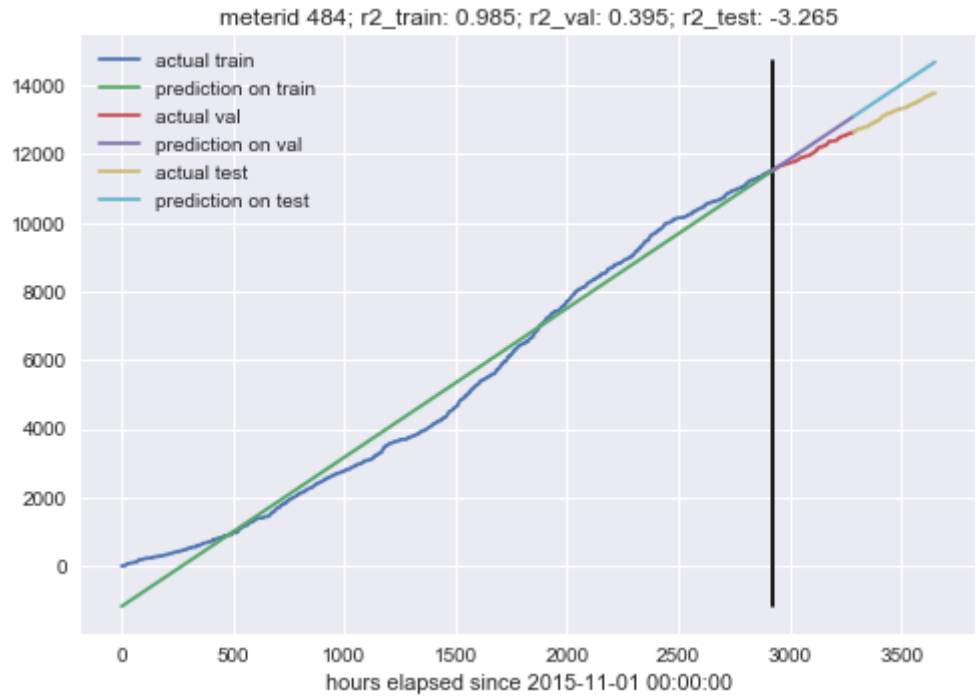

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

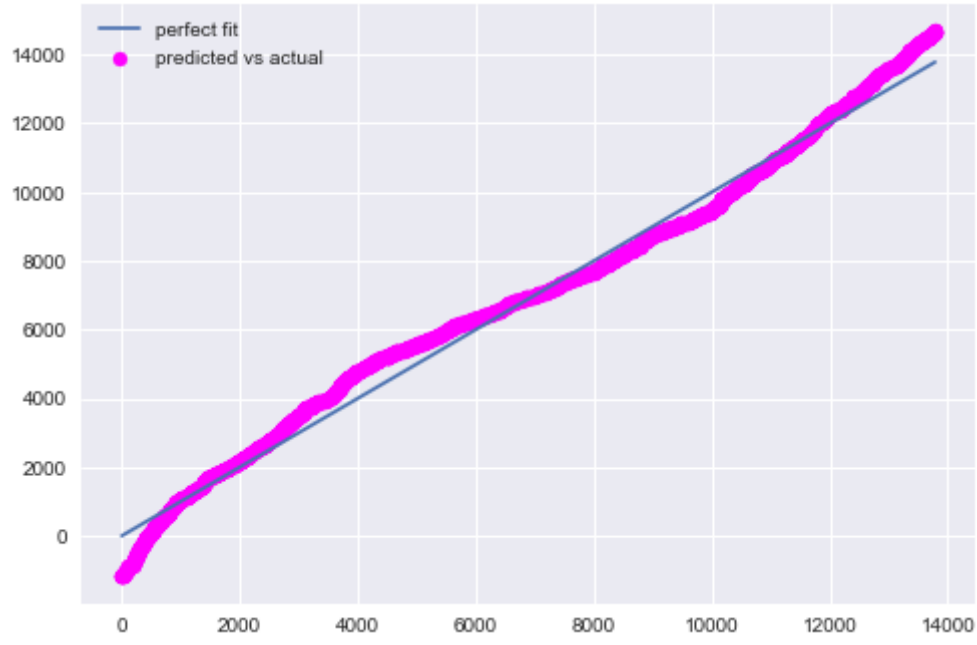

meterid 370; r2_train: 0.964; r2_val: -4.586; r2_test: -27.926
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

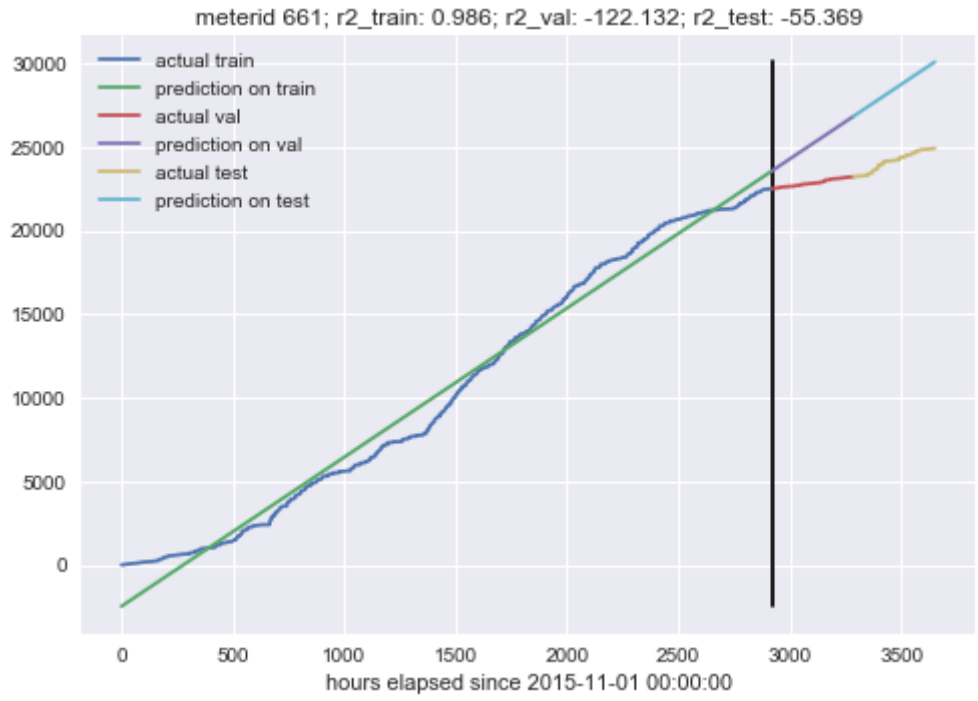

perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000
12000

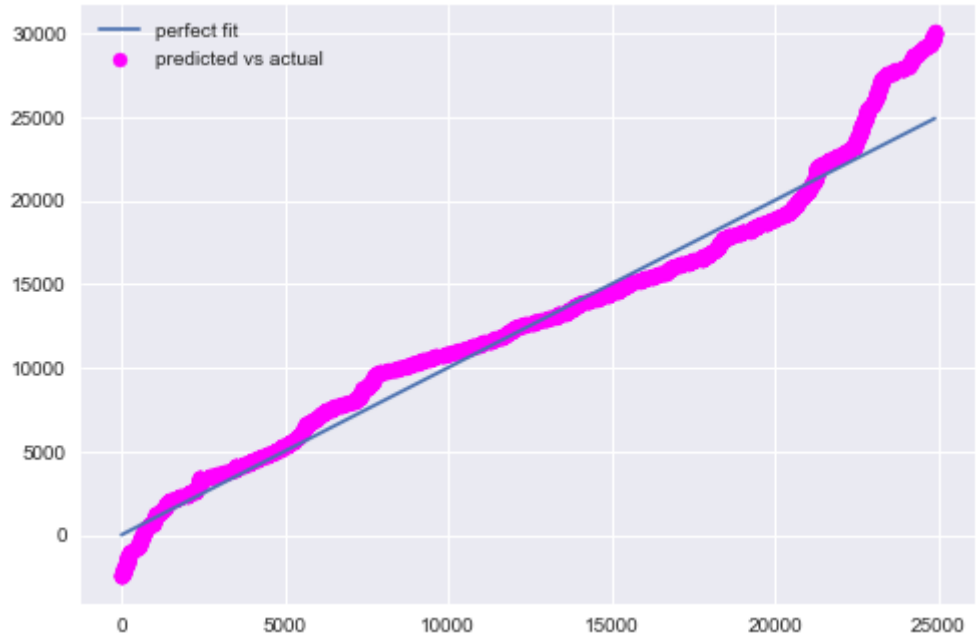

meterid 483; r2_train: 0.971; r2_val: -254.175; r2_test: -379.613
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

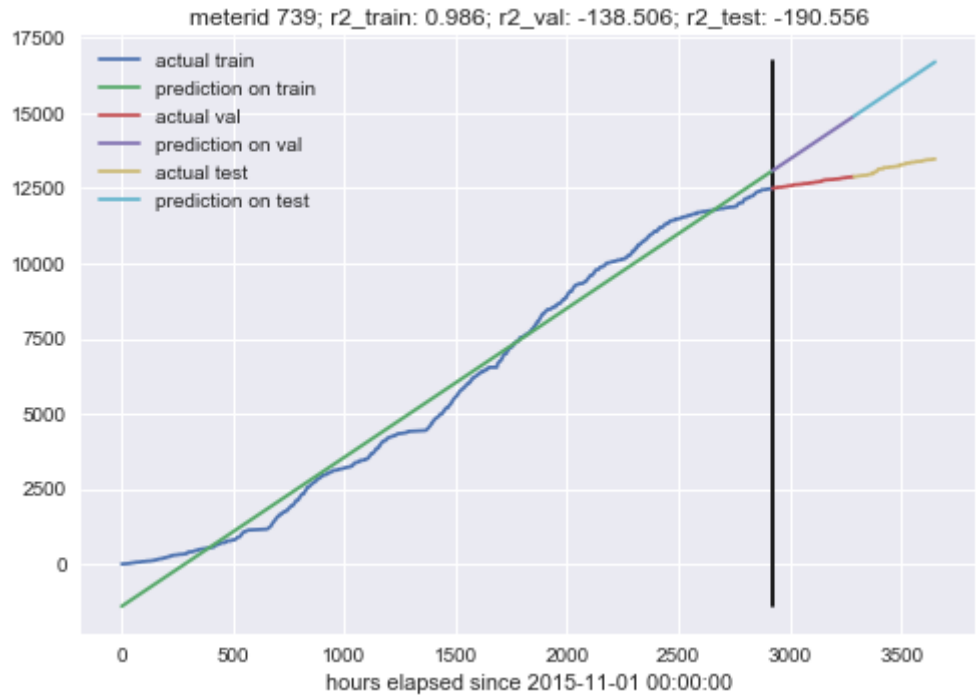

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

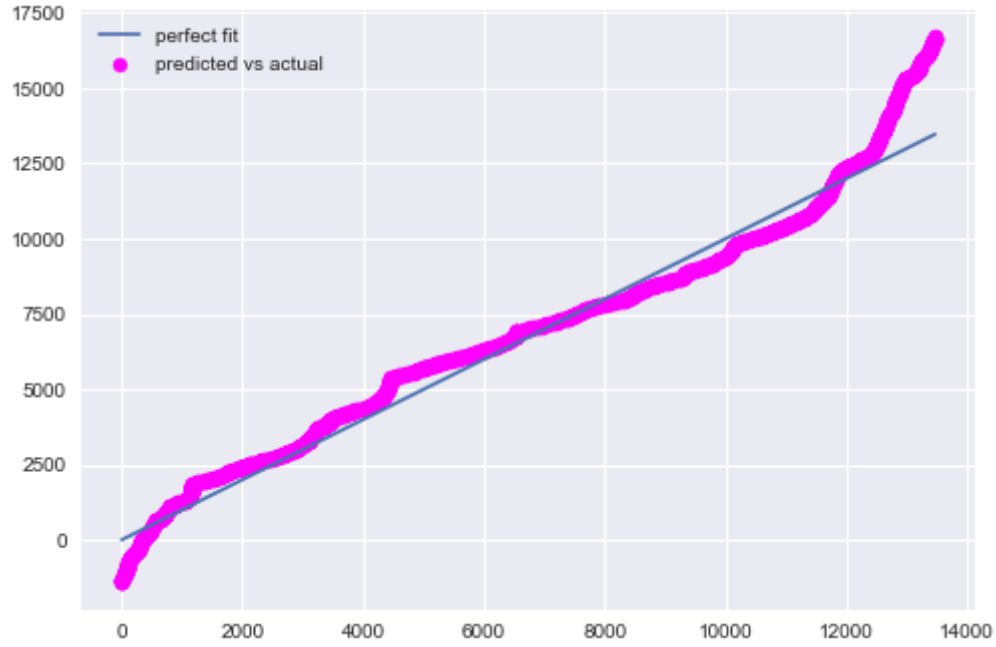

meterid 484; r2_train: 0.985; r2_val: 0.395; r2_test: -3.265
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

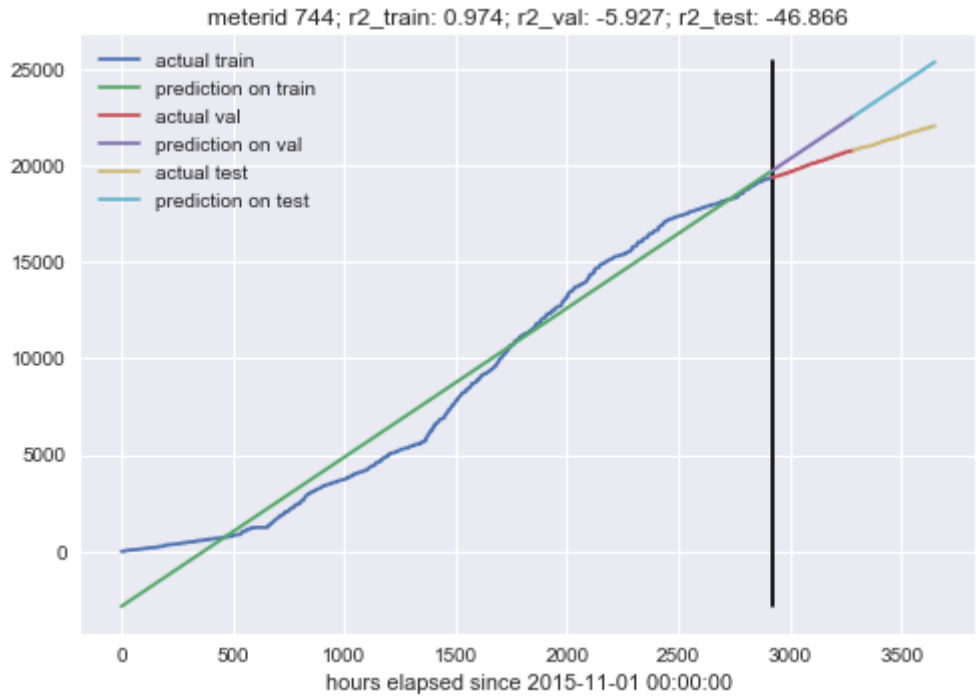

perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000
12000
14000

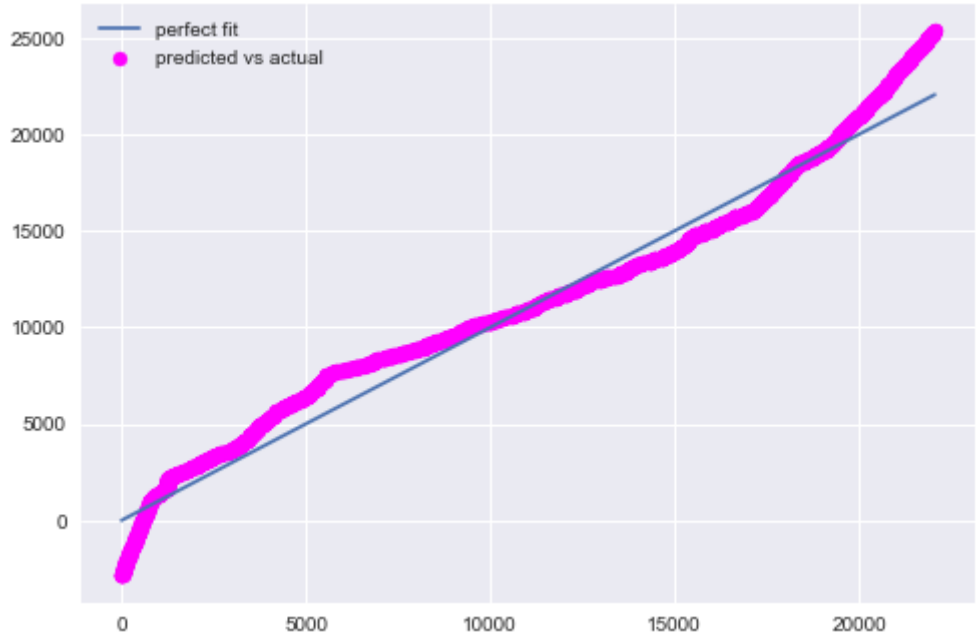

meterid 661; r2_train: 0.986; r2_val: -122.132; r2_test: -55.369
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

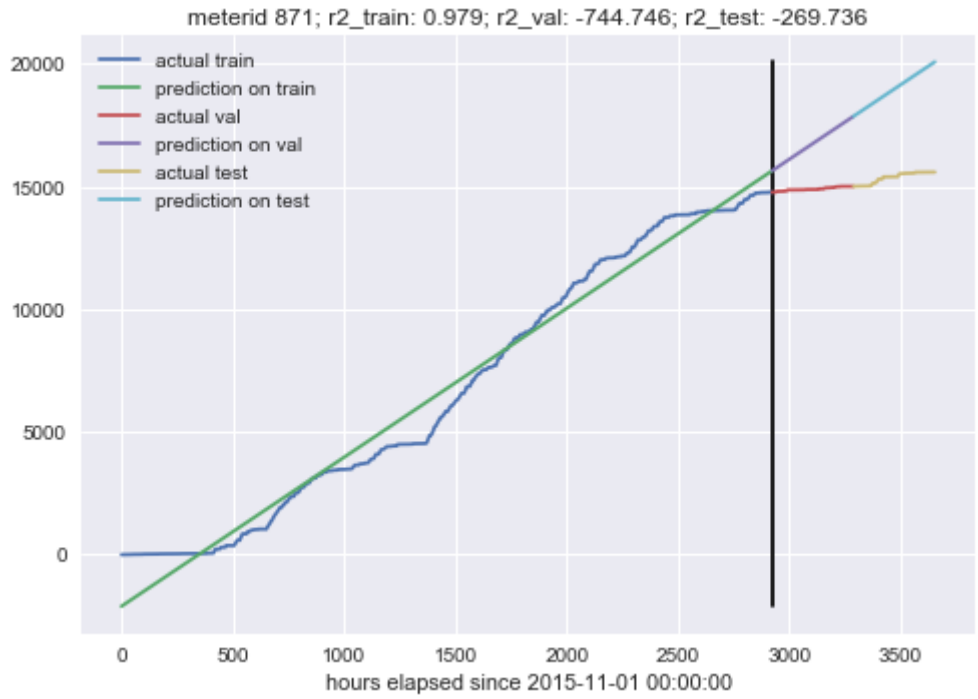

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000

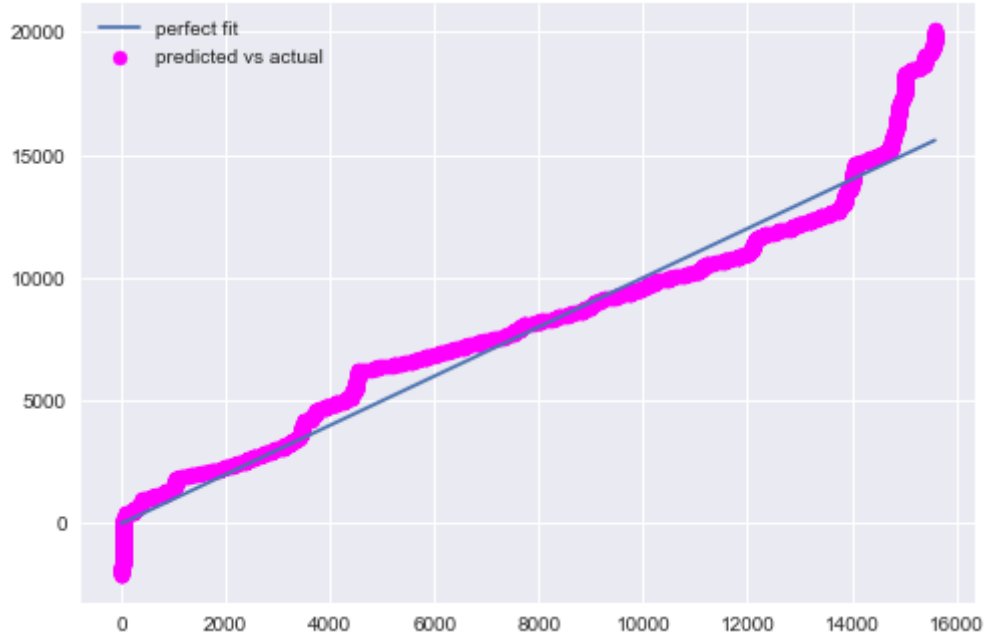

meterid 739; r2_train: 0.986; r2_val: -138.506; r2_test: -190.556
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

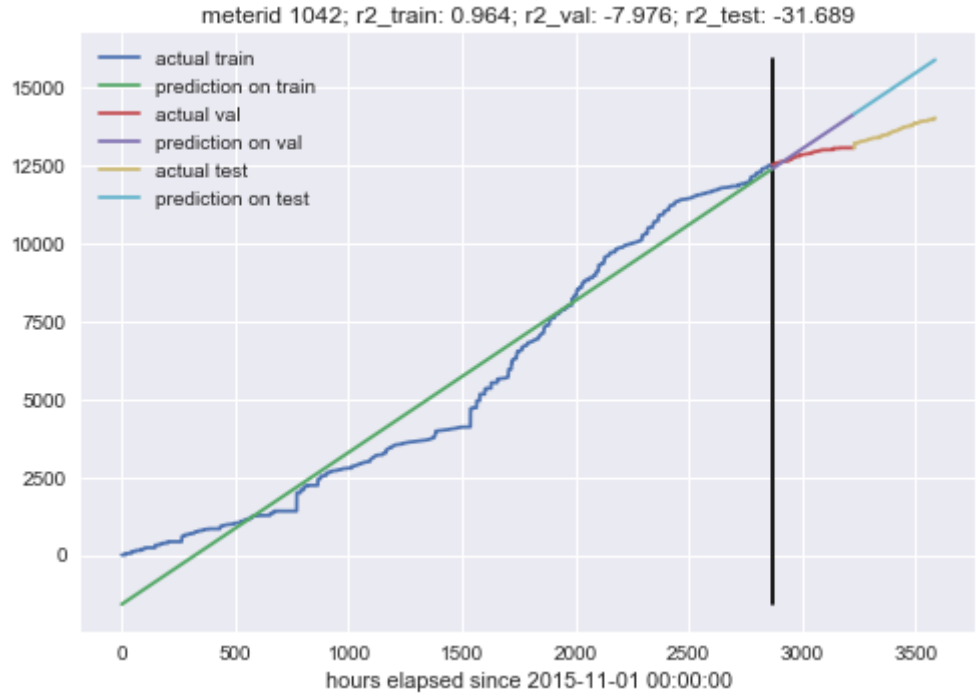

perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000

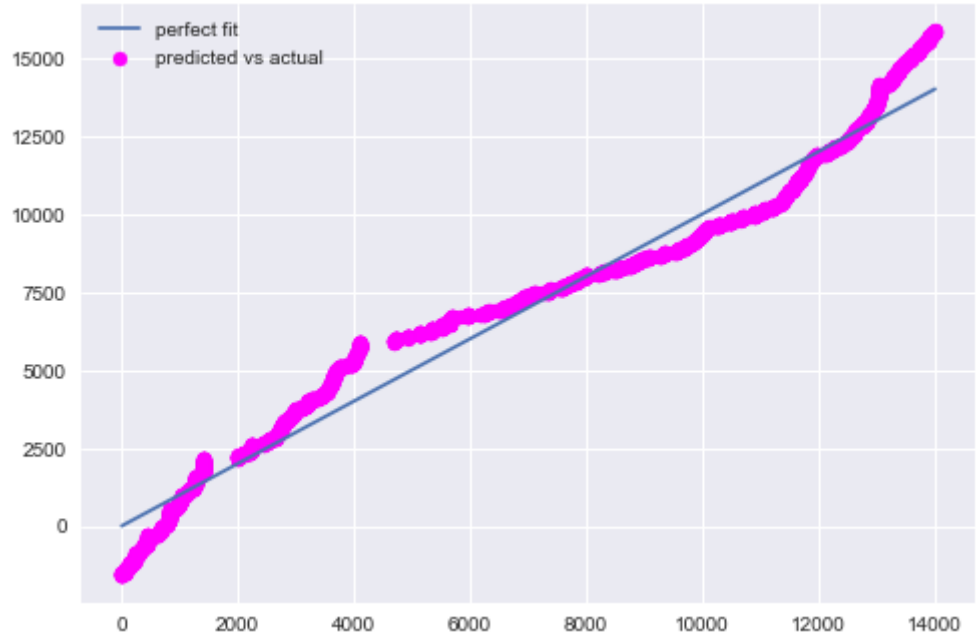

meterid 744; r2_train: 0.974; r2_val: -5.927; r2_test: -46.866
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

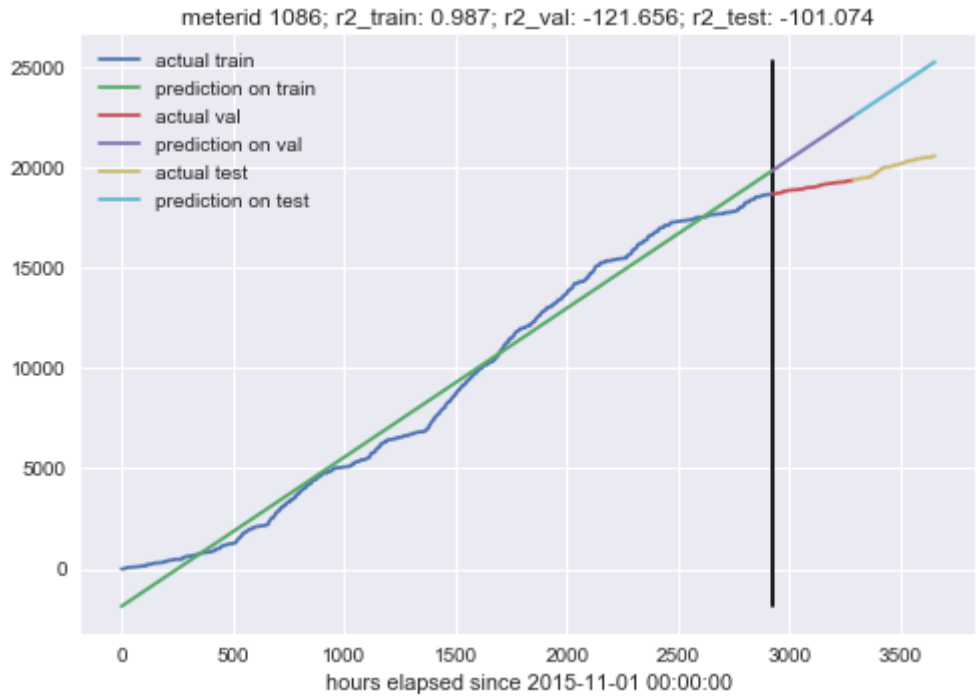

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

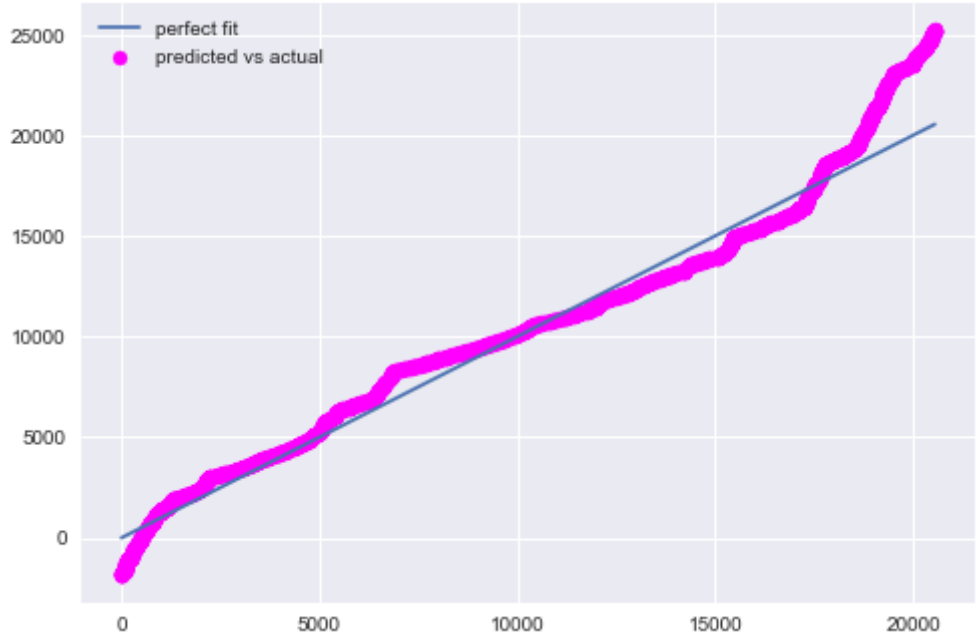

meterid 871; r2_train: 0.979; r2_val: -744.746; r2_test: -269.736
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

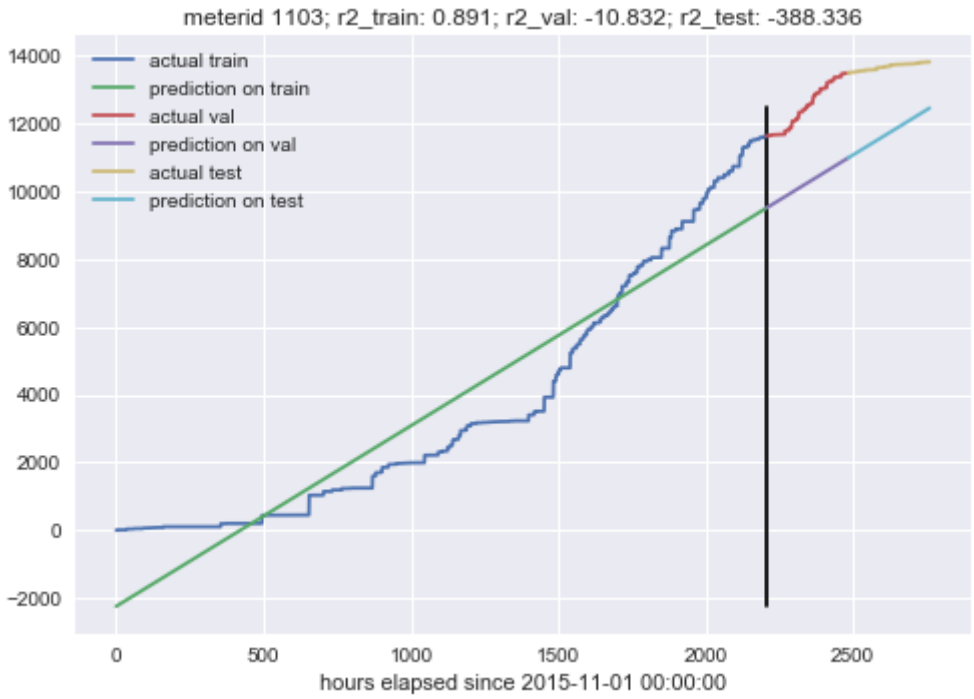

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000
16000

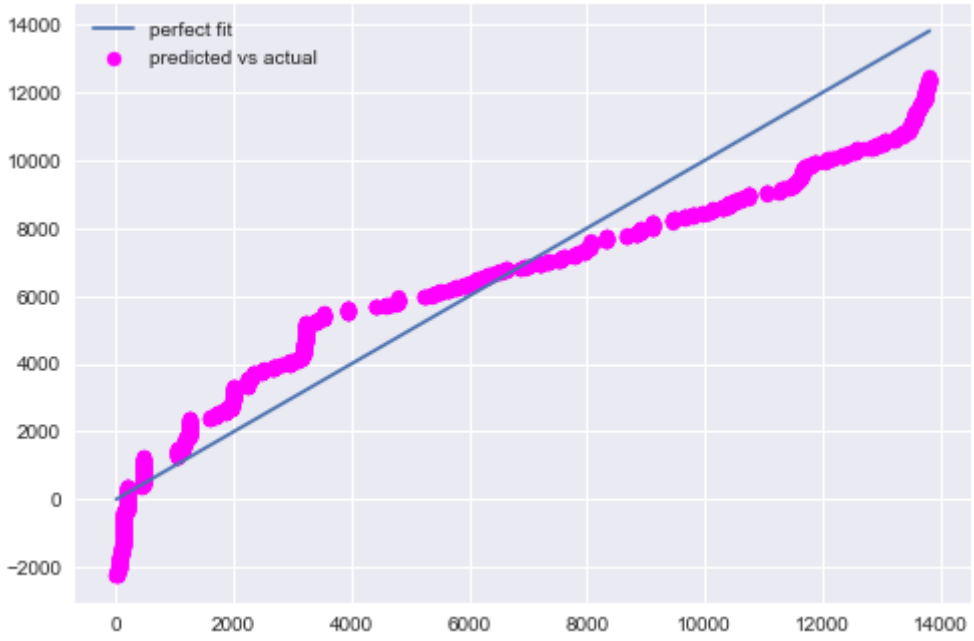

meterid 1042; r2_train: 0.964; r2_val: -7.976; r2_test: -31.689
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

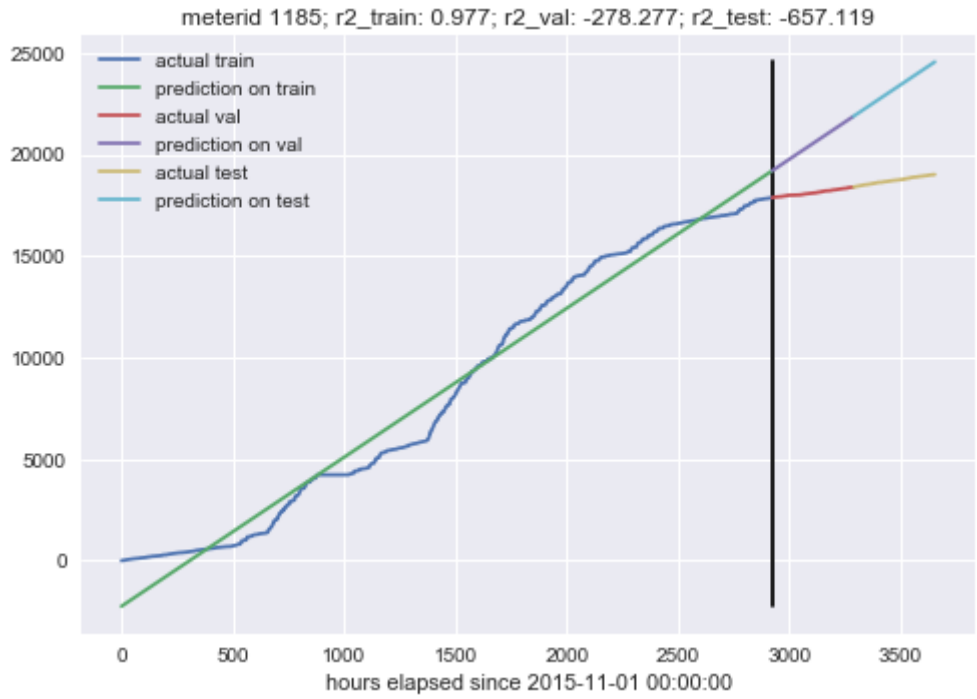

perfect fit
predicted vs actual
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000

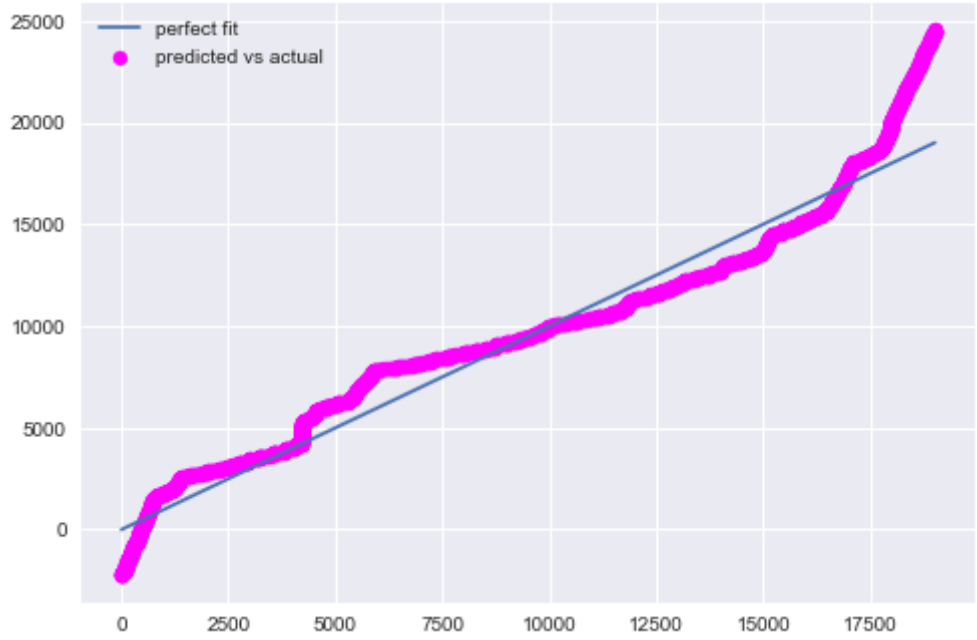

meterid 1086; r2_train: 0.987; r2_val: -121.656; r2_test: -101.074
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

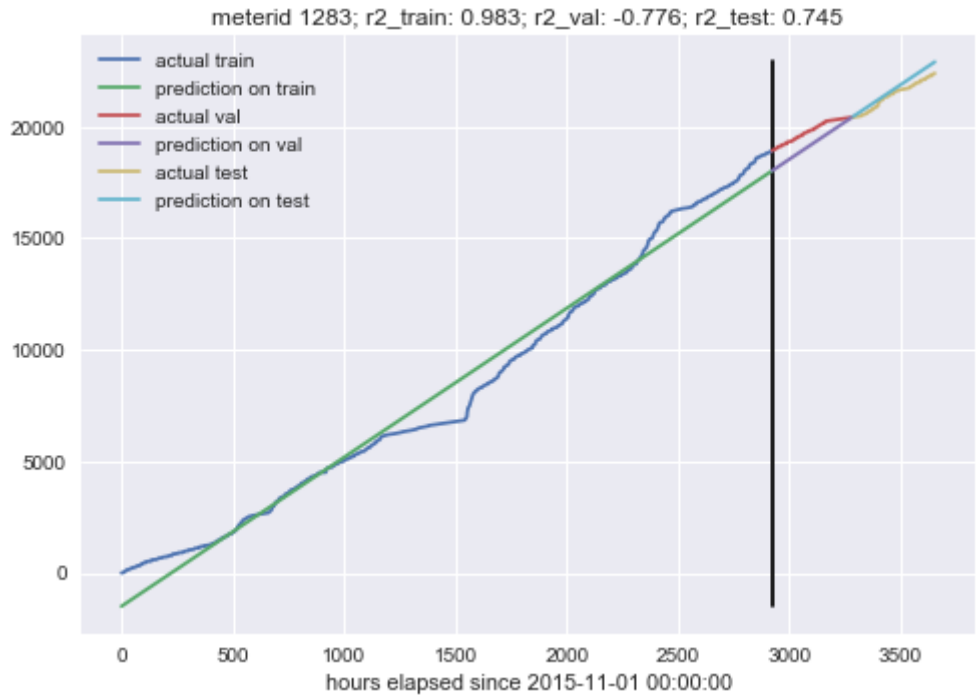

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

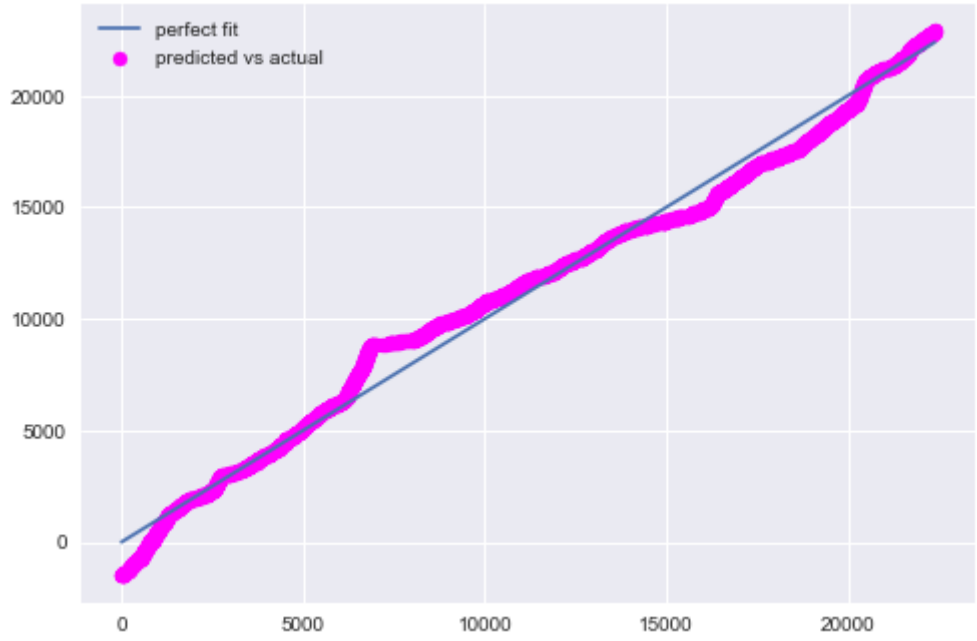

meterid 1103; r2_train: 0.891; r2_val: -10.832; r2_test: -388.336
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
hours elapsed since 2015-11-01 00:00:00

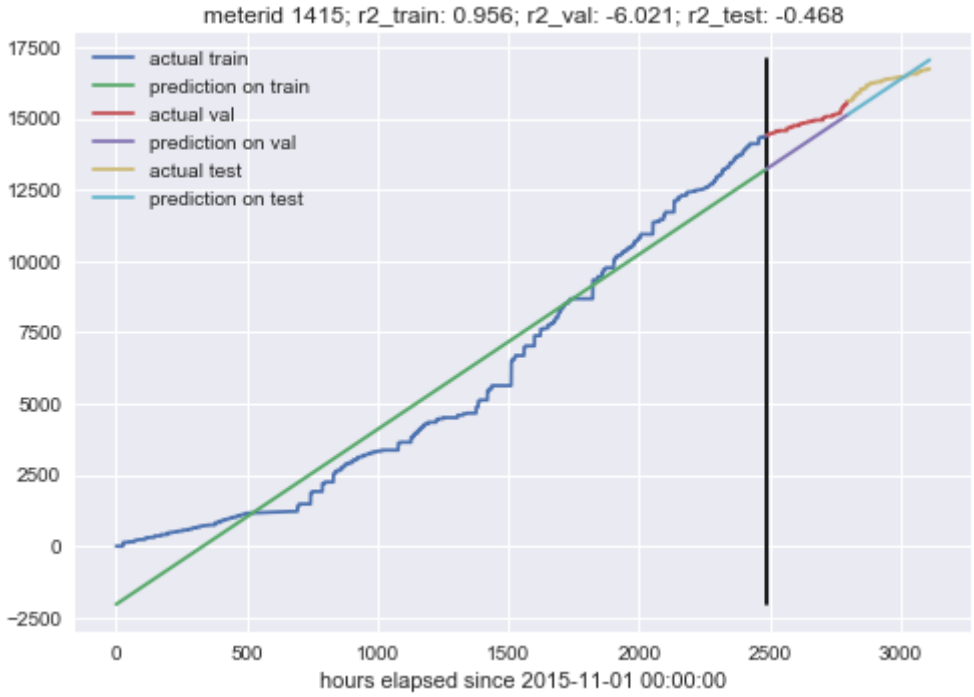

perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000
12000
14000

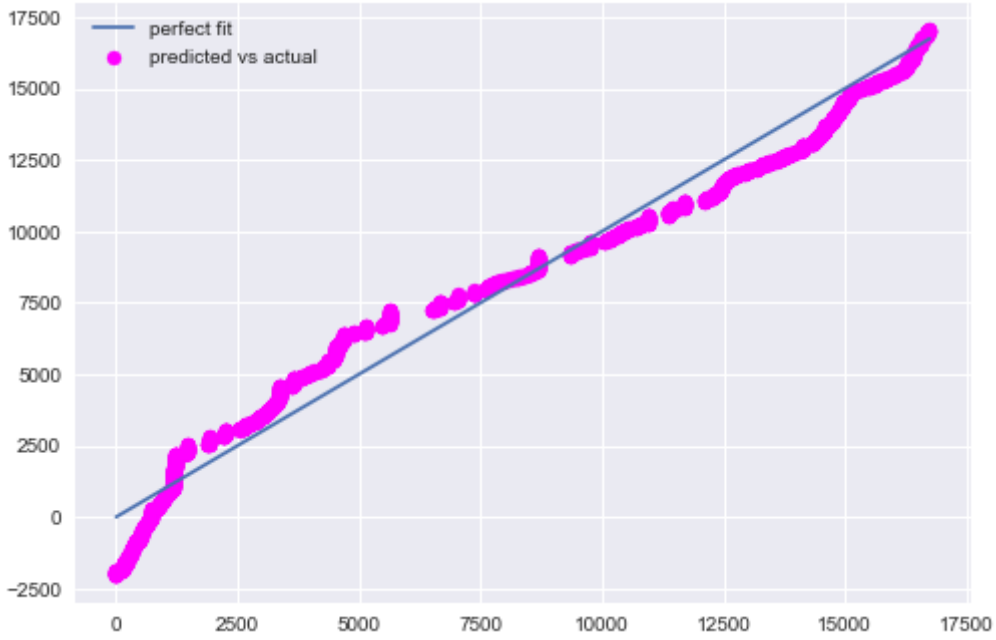

meterid 1185; r2_train: 0.977; r2_val: -278.277; r2_test: -657.119
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

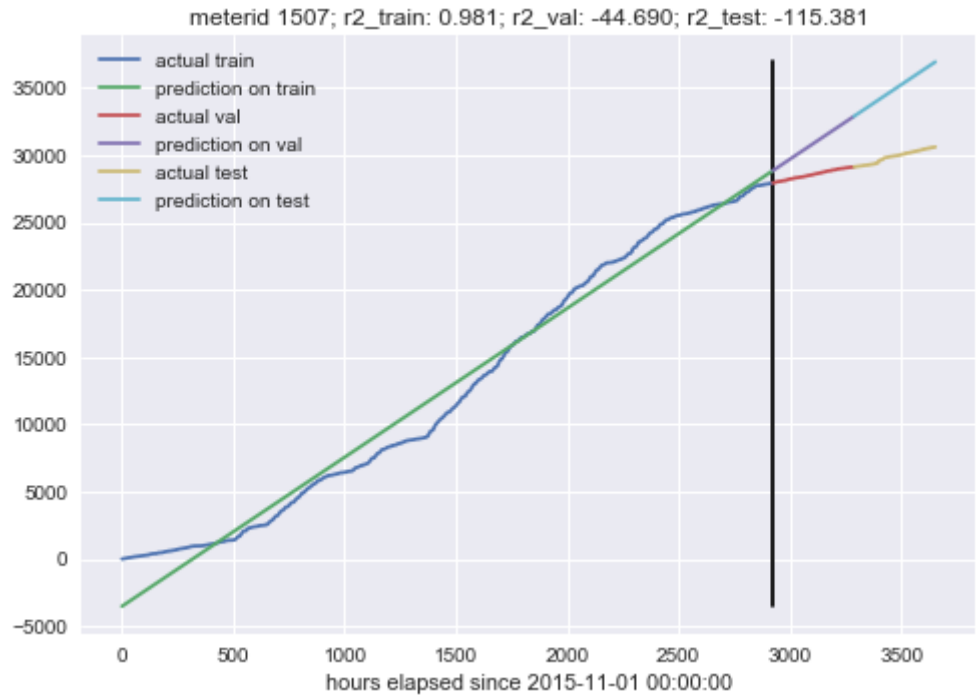

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

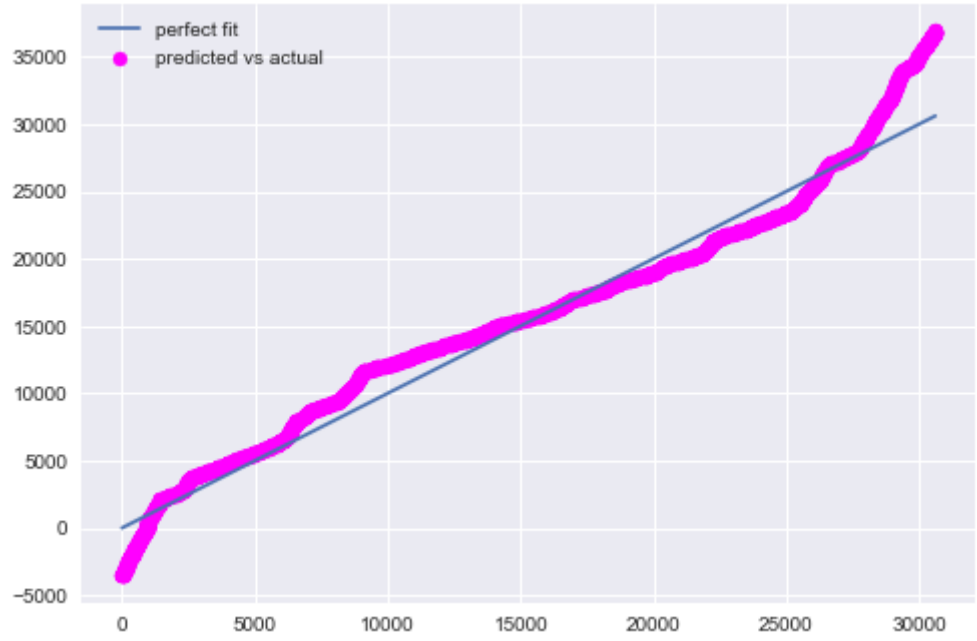

meterid 1283; r2_train: 0.983; r2_val: -0.776; r2_test: 0.745
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

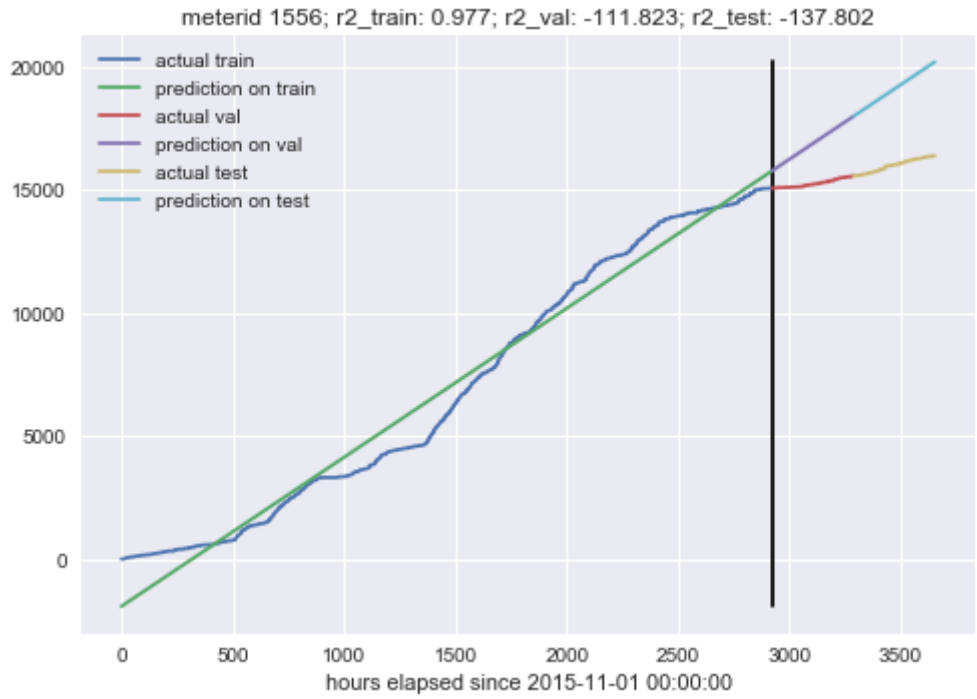

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
5000
10000
15000
20000

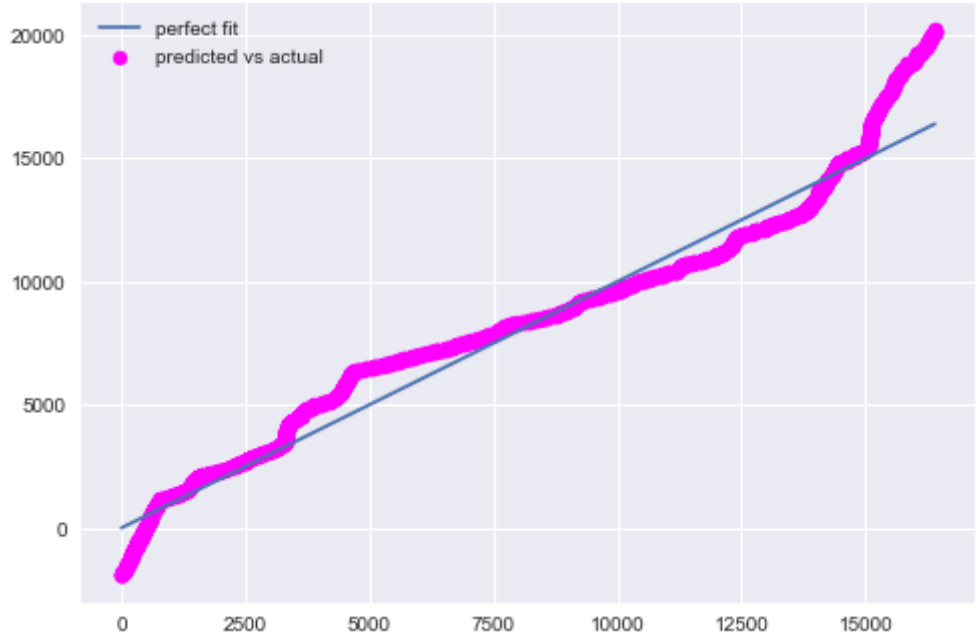

meterid 1415; r2_train: 0.956; r2_val: -6.021; r2_test: -0.468
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

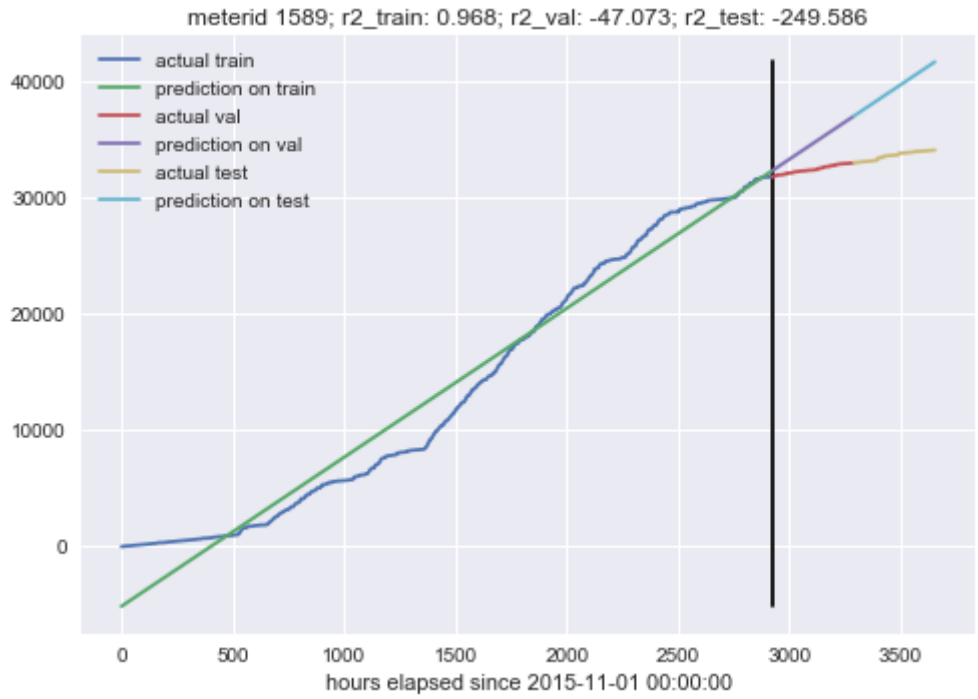

perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
2500
5000
7500
10000
12500
15000
17500

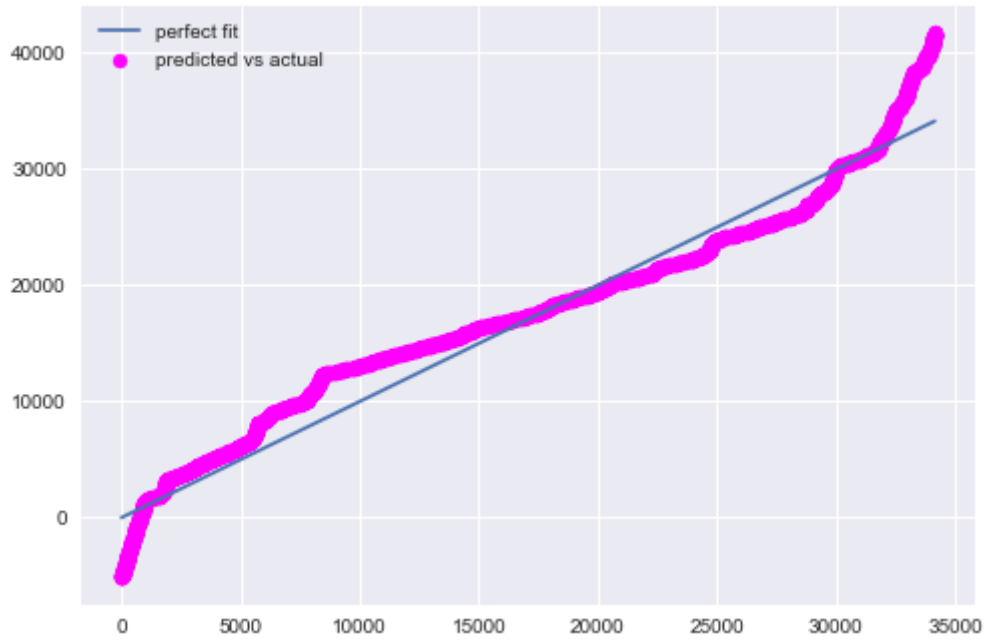

meterid 1507; r2_train: 0.981; r2_val: -44.690; r2_test: -115.381
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

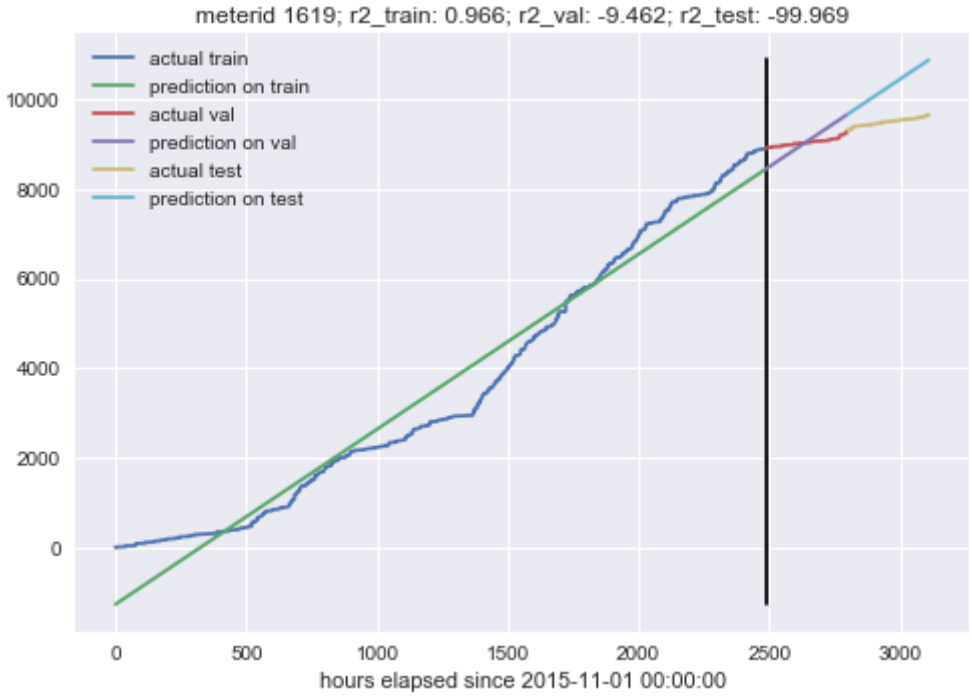

perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000
30000

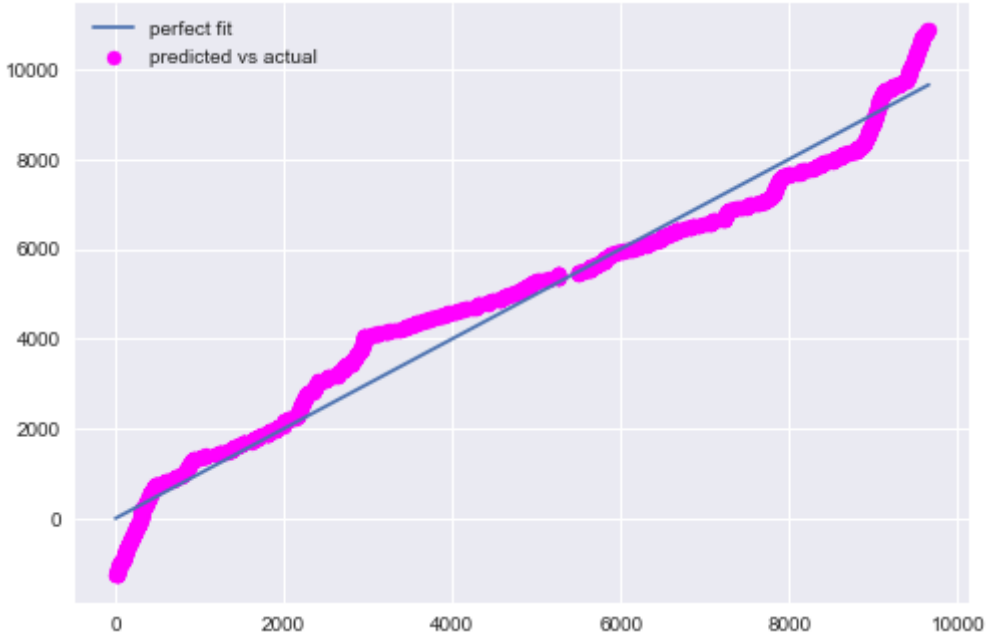

meterid 1556; r2_train: 0.977; r2_val: -111.823; r2_test: -137.802
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

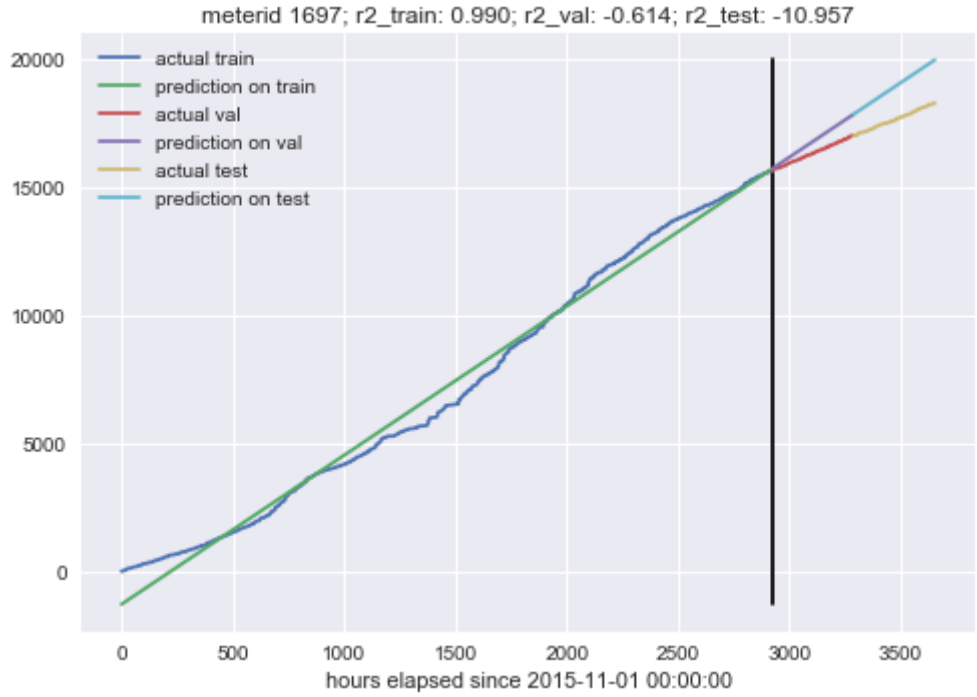

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000

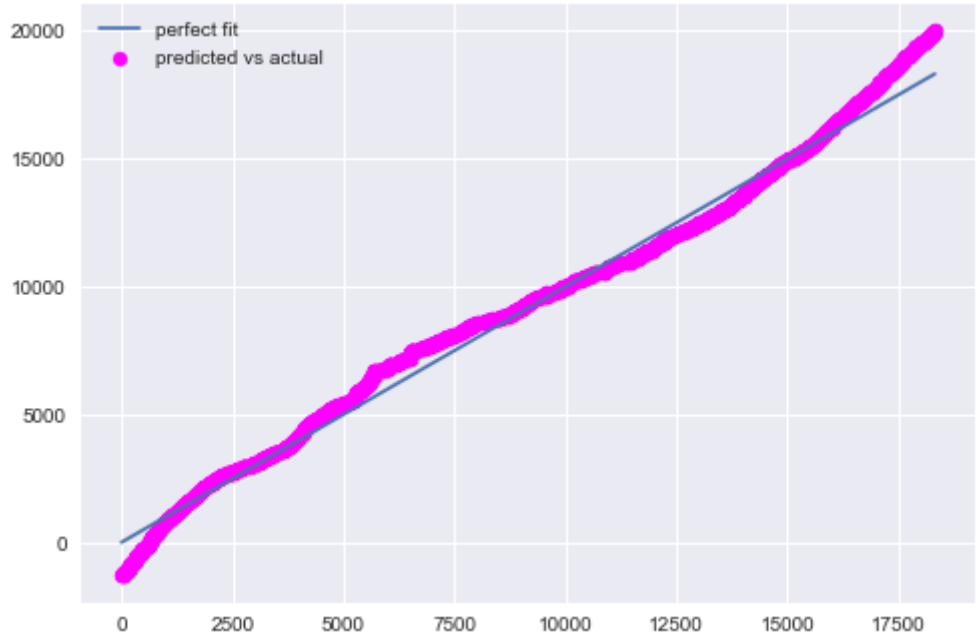

meterid 1589; r2_train: 0.968; r2_val: -47.073; r2_test: -249.586
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
40000
30000
20000
10000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

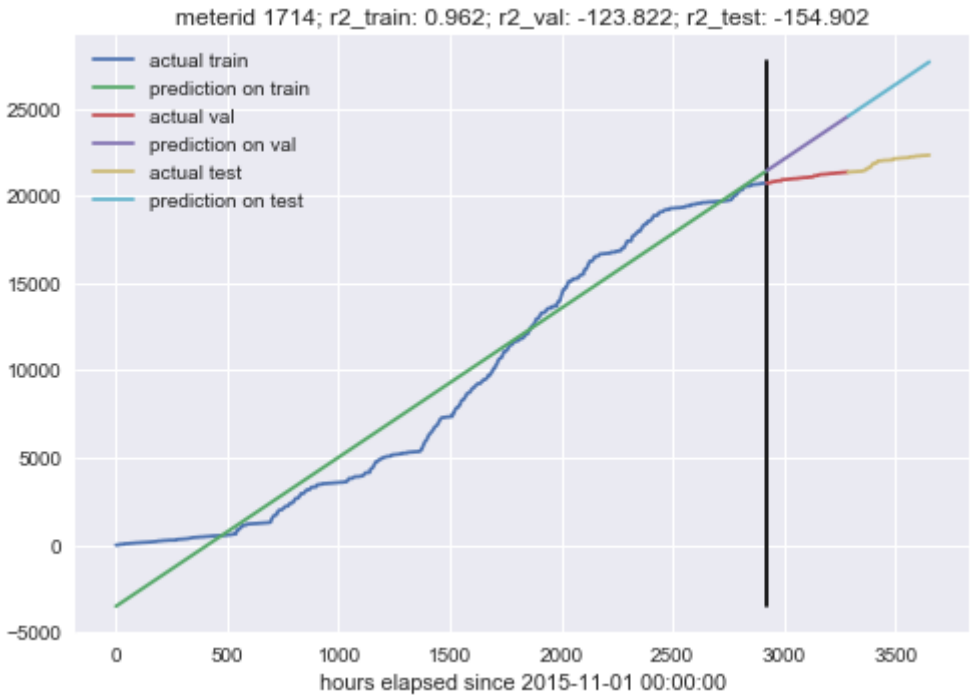

perfect fit
predicted vs actual
40000
30000
20000
10000
0
0
5000
10000
15000
20000
25000
30000
35000

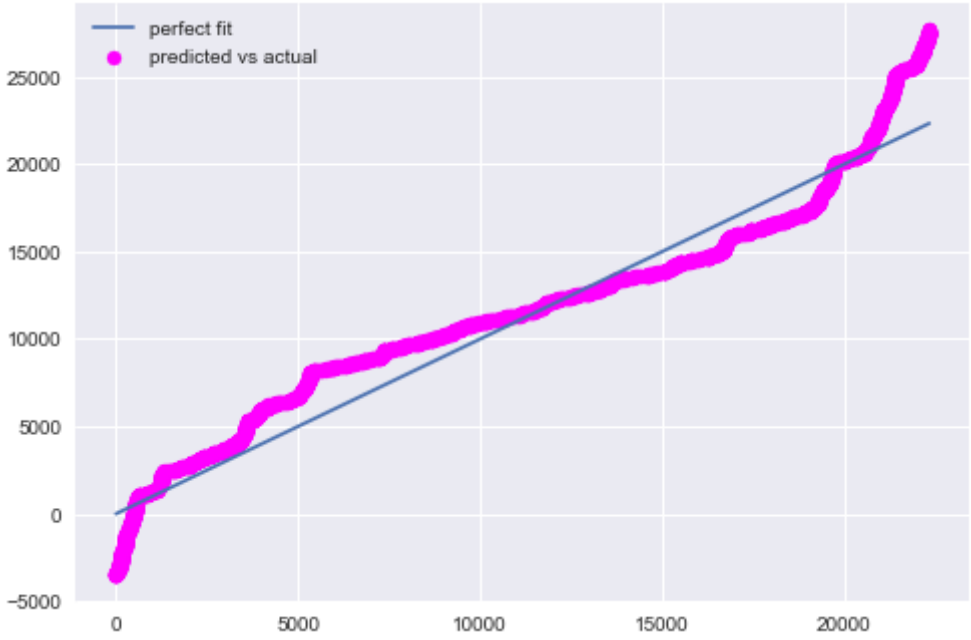

meterid 1619; r2_train: 0.966; r2_val: -9.462; r2_test: -99.969
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

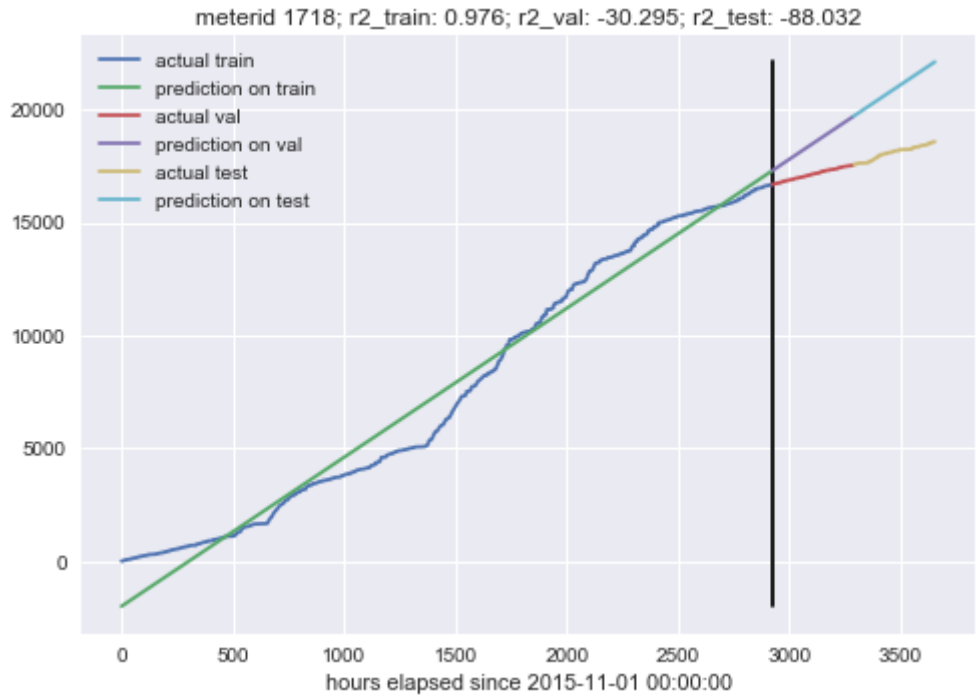

perfect fit
predicted vs actual
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000

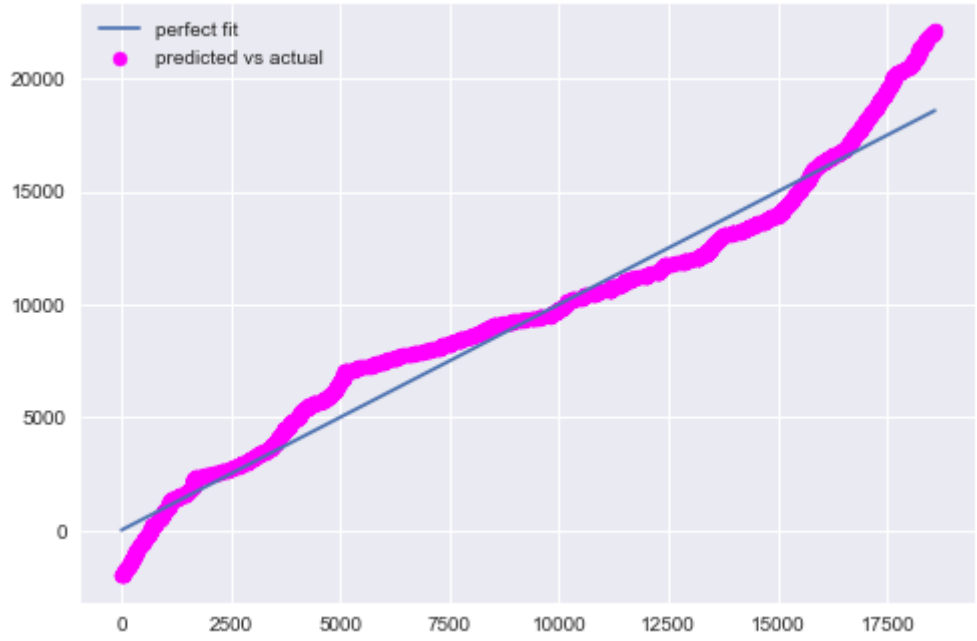

meterid 1697; r2_train: 0.990; r2_val: -0.614; r2_test: -10.957
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

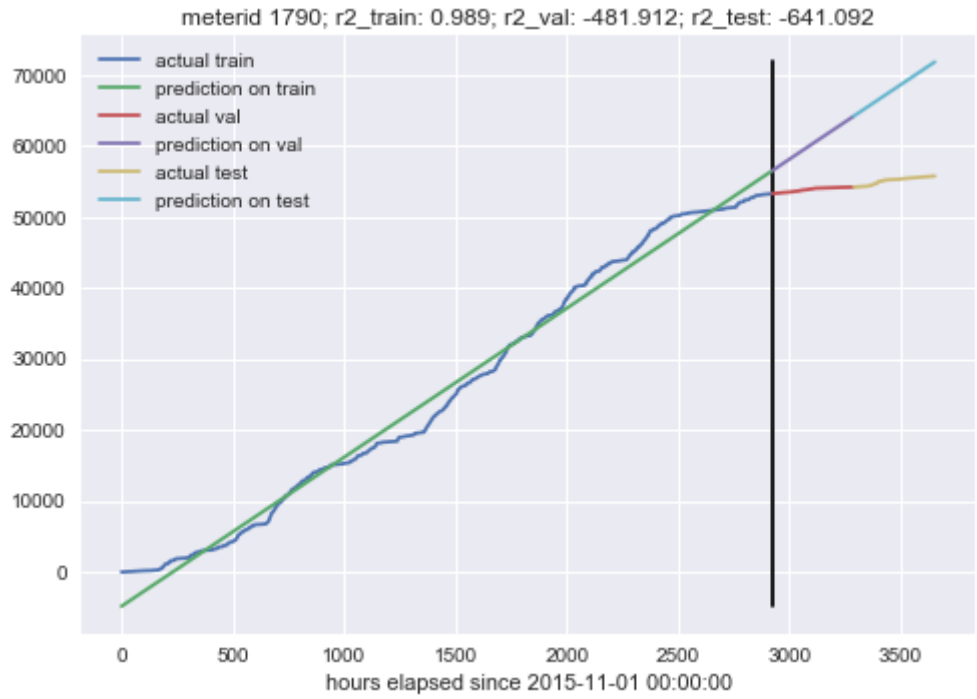

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

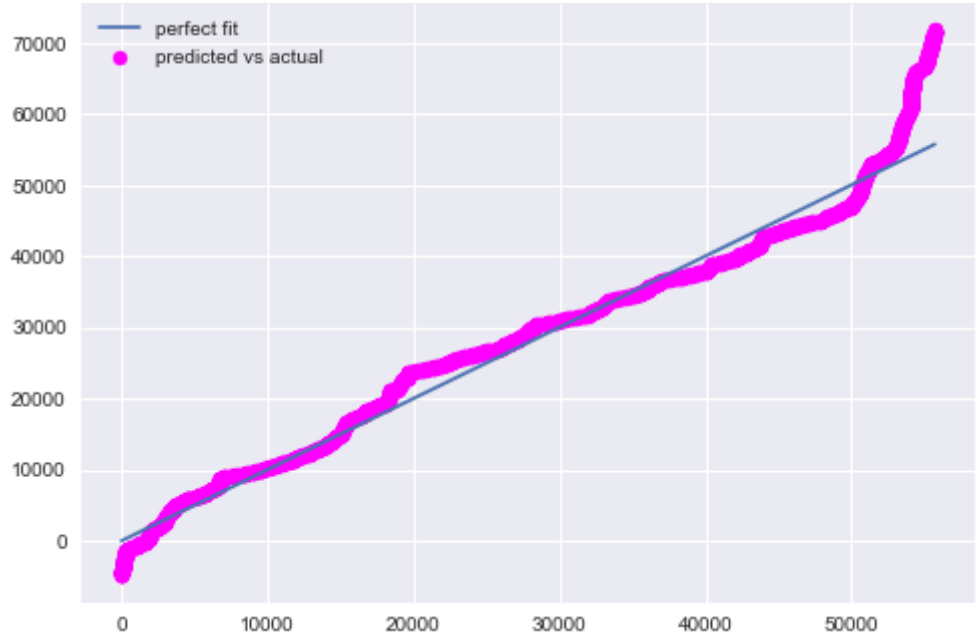

meterid 1714; r2_train: 0.962; r2_val: -123.822; r2_test: -154.902
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

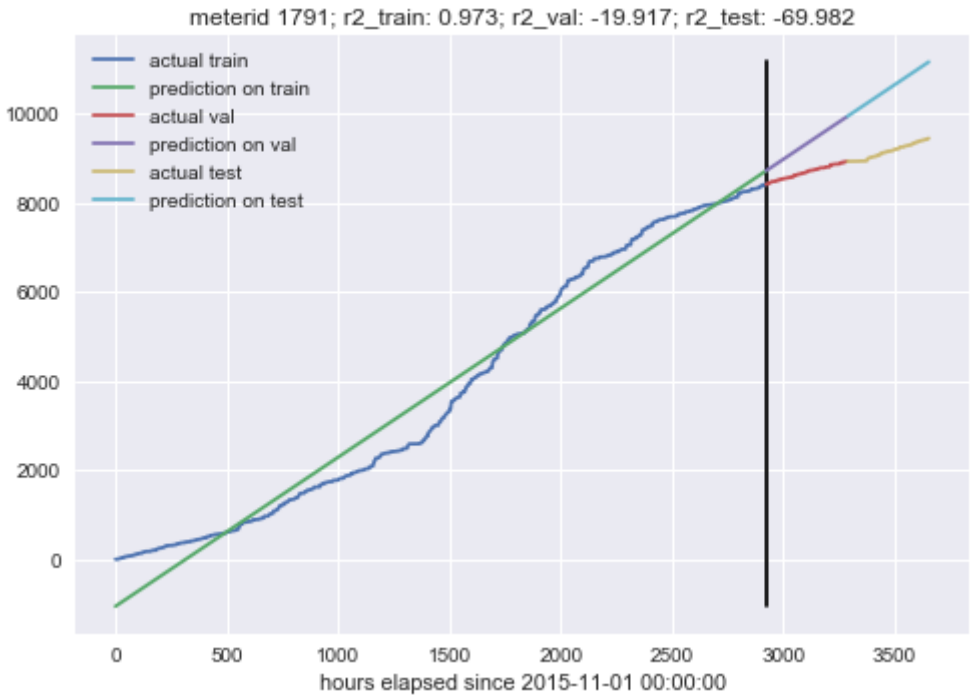

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000

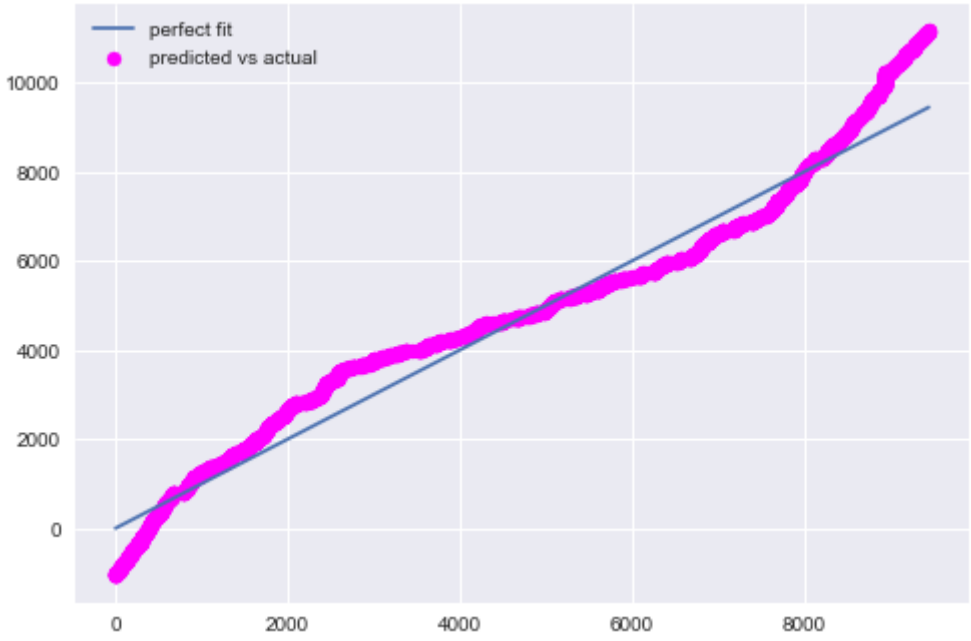

meterid 1718; r2_train: 0.976; r2_val: -30.295; r2_test: -88.032
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

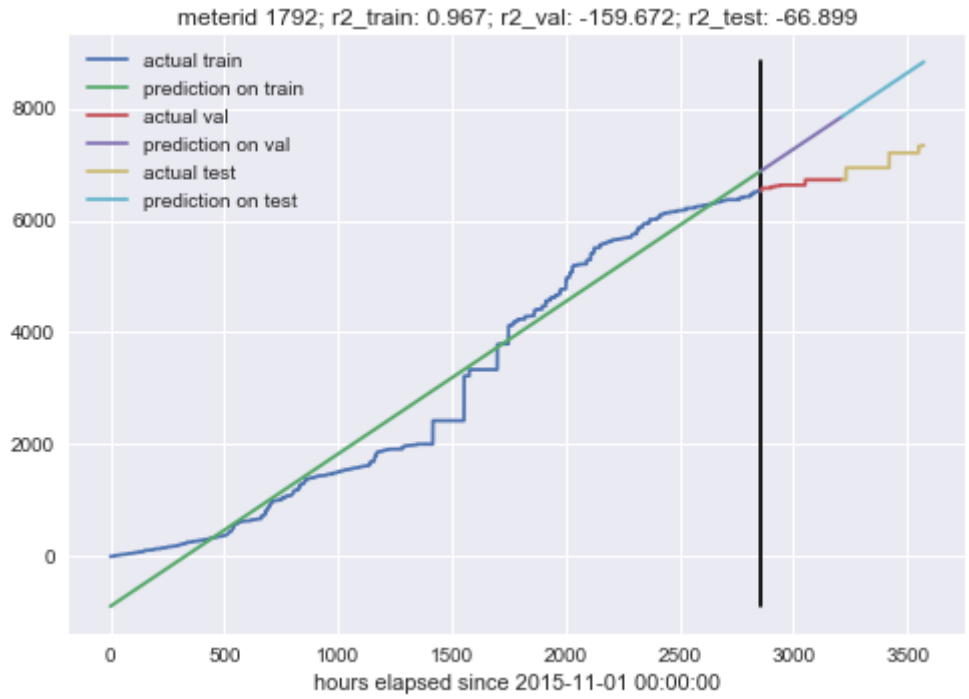

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

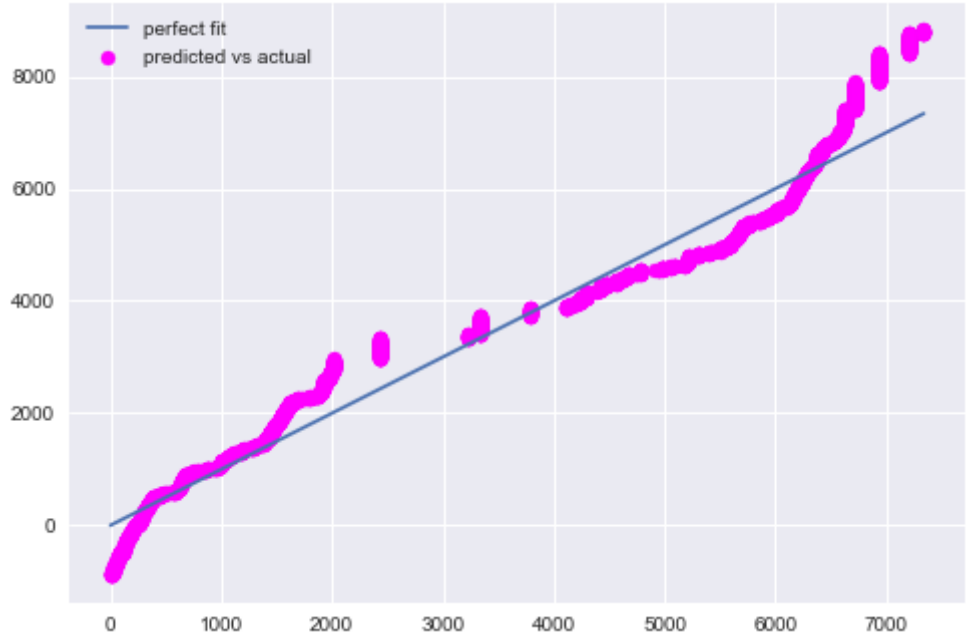

meterid 1790; r2_train: 0.989; r2_val: -481.912; r2_test: -641.092
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
70000
60000
50000
40000
30000
20000
10000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

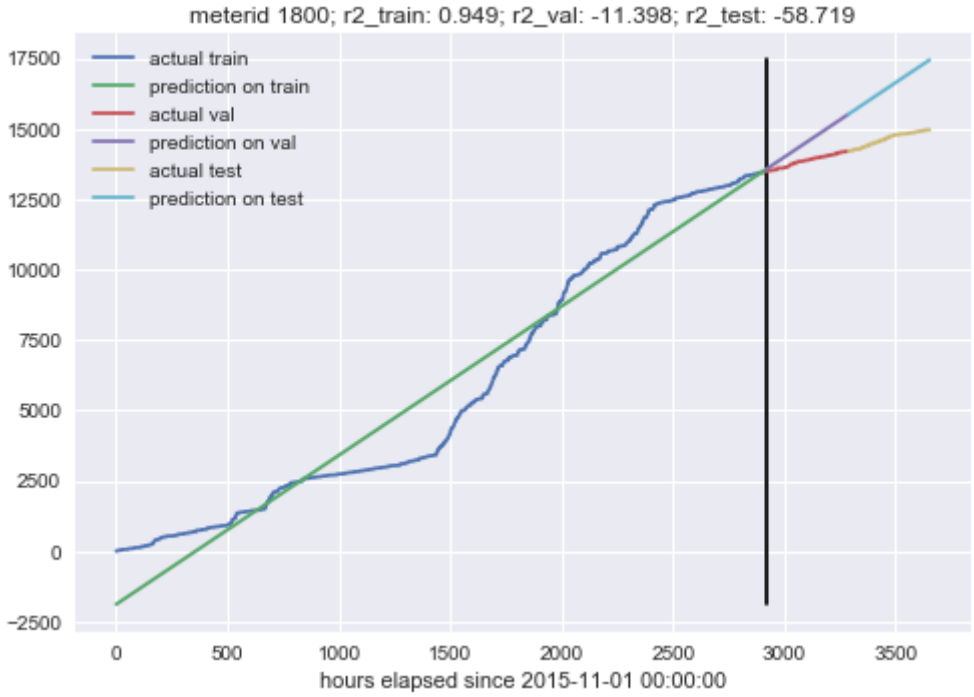

perfect fit
predicted vs actual
70000
60000
50000
40000
30000
20000
10000
0
0
10000
20000
30000
40000
50000

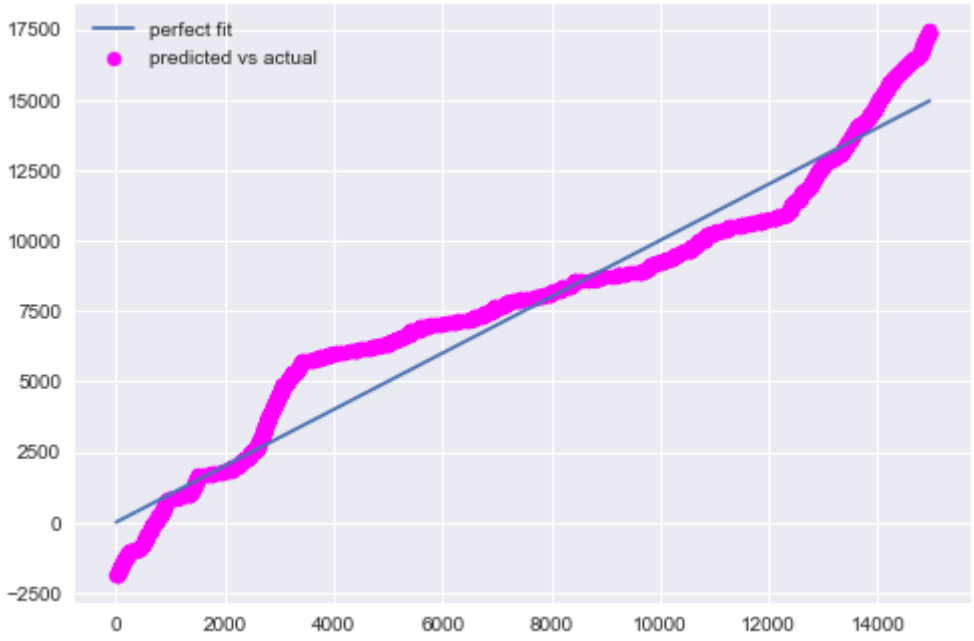

meterid 1791; r2_train: 0.973; r2_val: -19.917; r2_test: -69.982
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

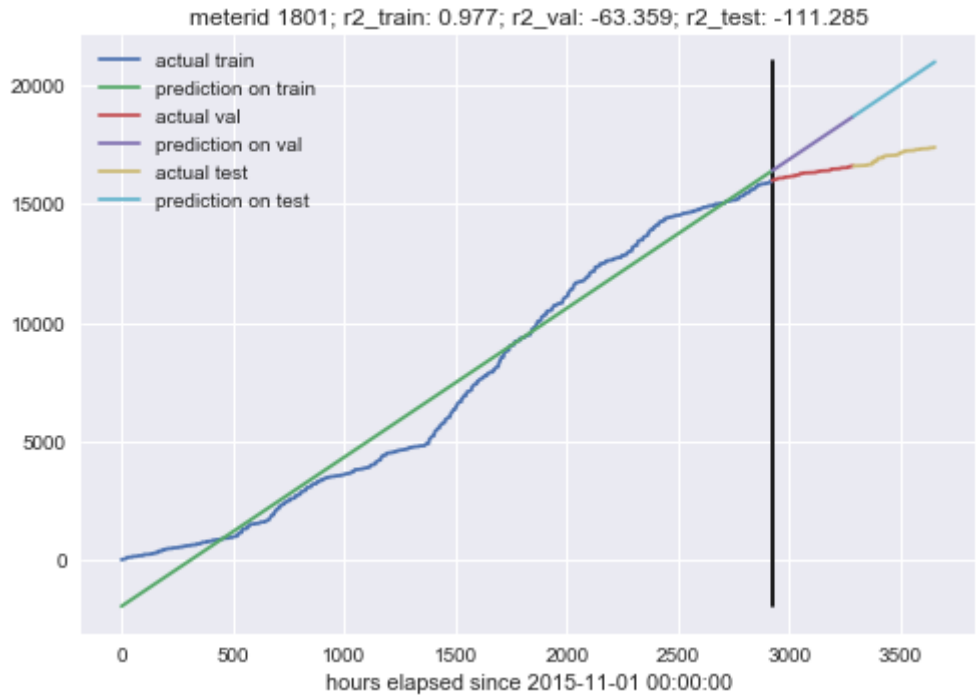

perfect fit
predicted vs actual
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000

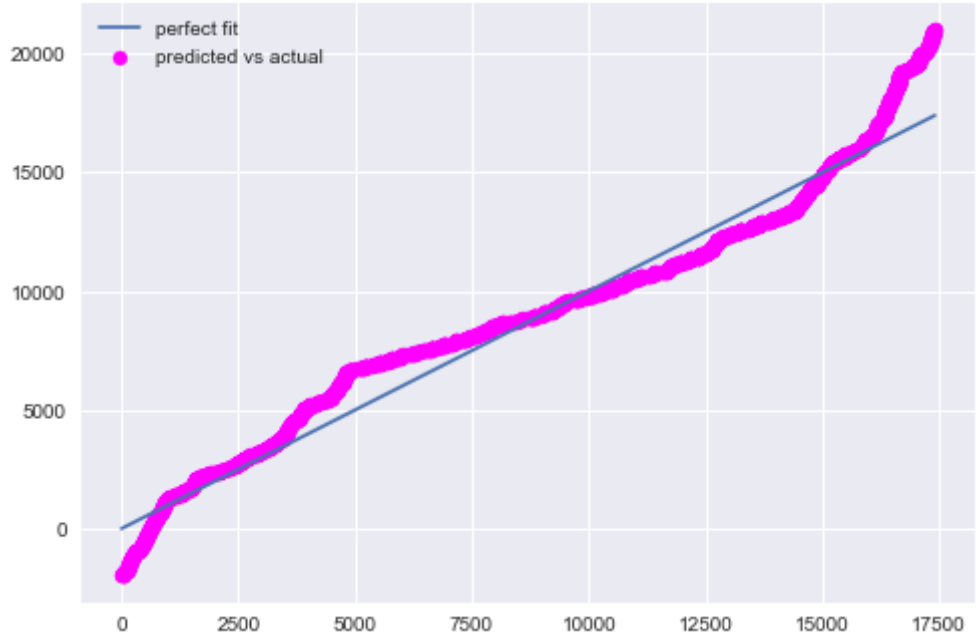

meterid 1792; r2_train: 0.967; r2_val: -159.672; r2_test: -66.899
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

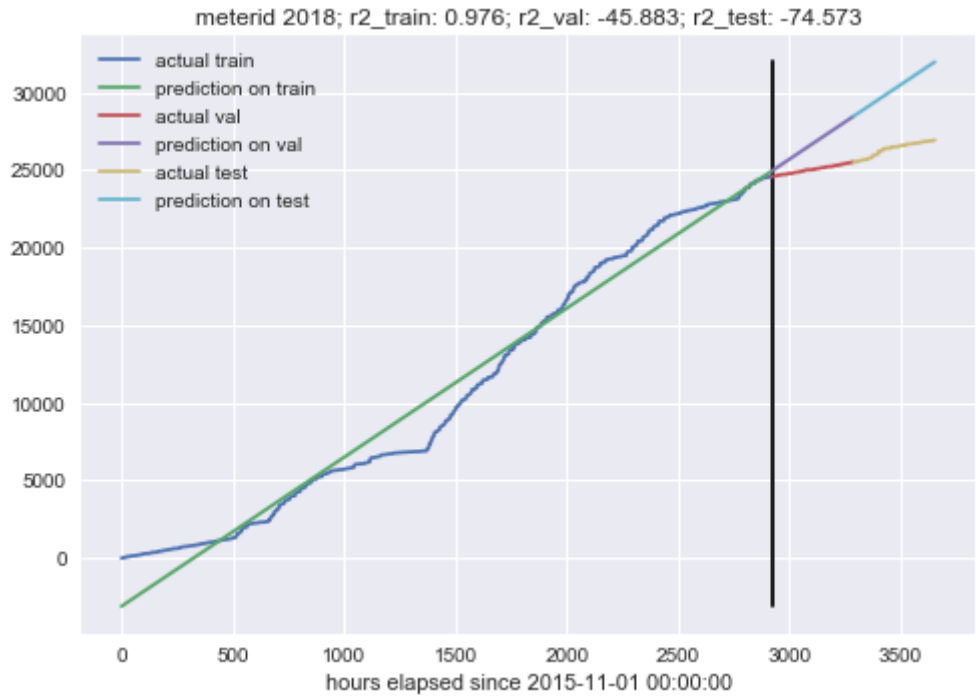

perfect fit
predicted vs actual
8000
6000
4000
2000
0
0
1000
2000
3000
4000
5000
6000
7000

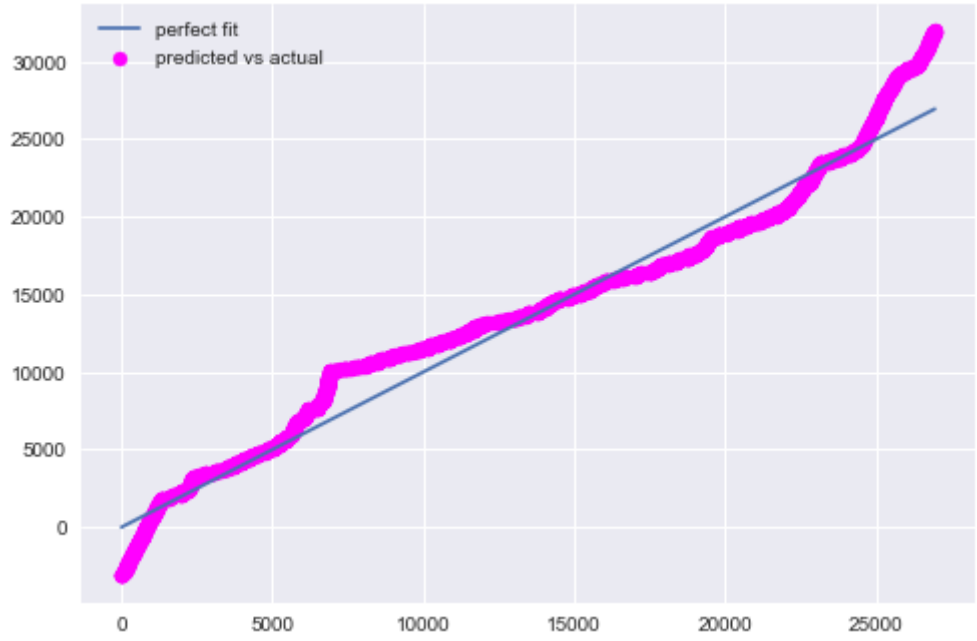

meterid 1800; r2_train: 0.949; r2_val: -11.398; r2_test: -58.719
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
2000
4000
6000
8000
10000
12000
14000


meterid 1801; r2_train: 0.977; r2_val: -63.359; r2_test: -111.285
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500


meterid 2018; r2_train: 0.976; r2_val: -45.883; r2_test: -74.573
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
30000
25000
20000
15000
10000
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0
0
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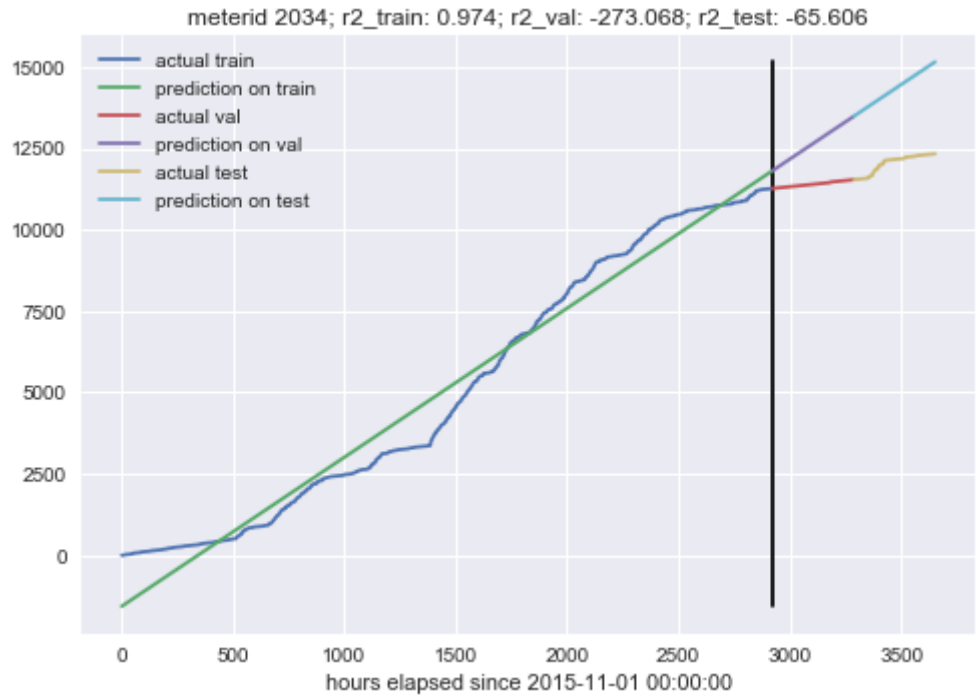
10000
15000
20000
25000


meterid 2034; r2_train: 0.974; r2_val: -273.068; r2_test: -65.606
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
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1000
1500
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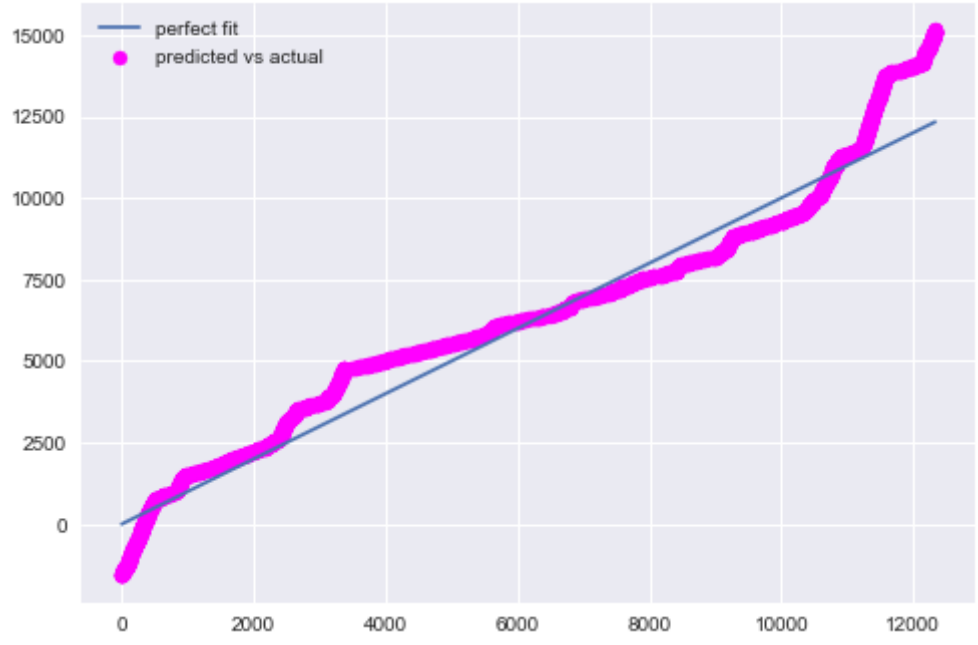
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
15000
12500
10000
7500
5000
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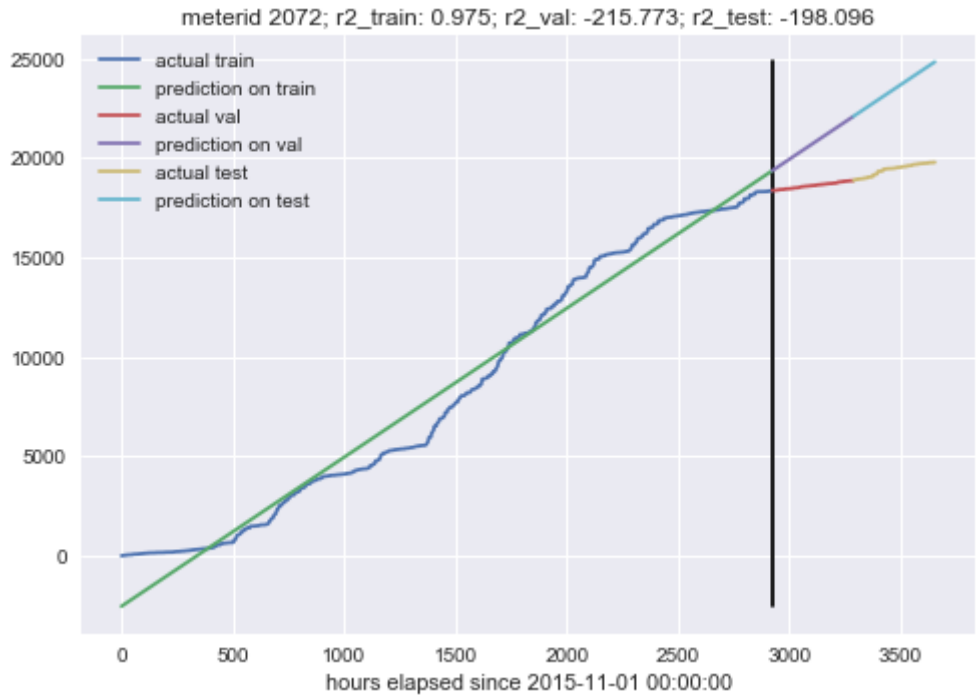
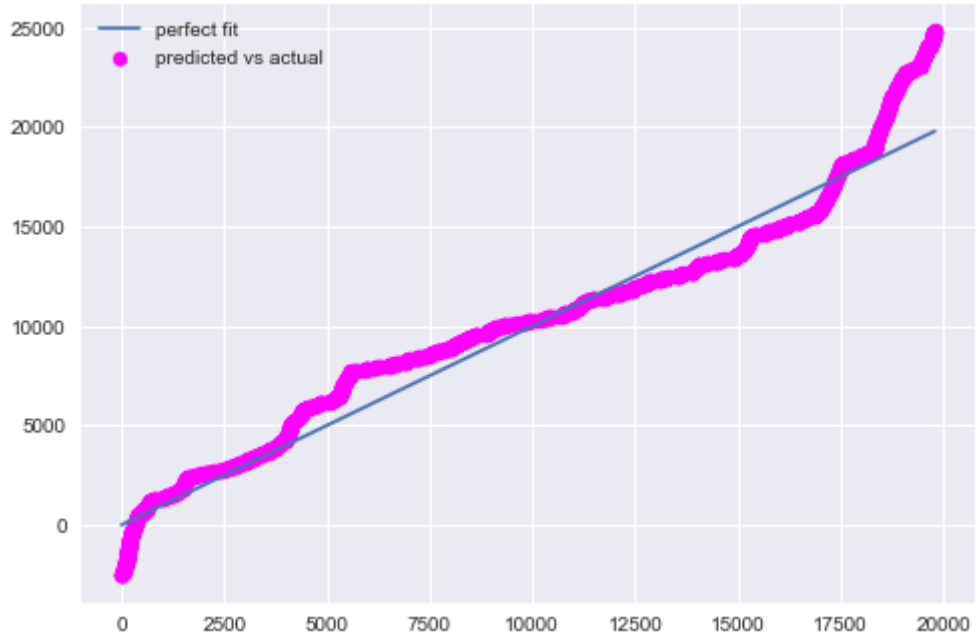
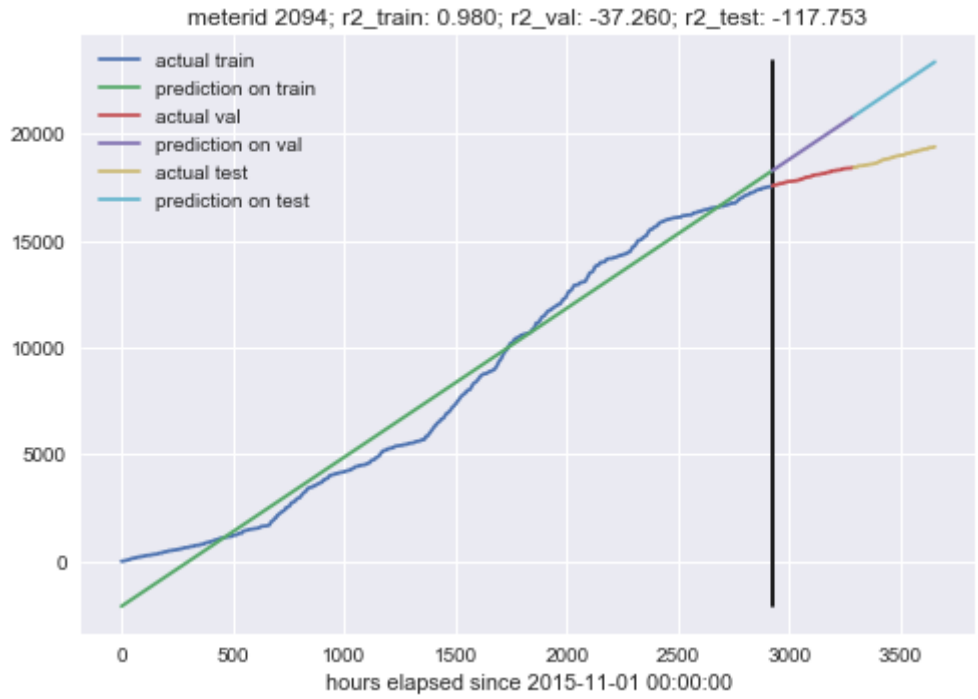
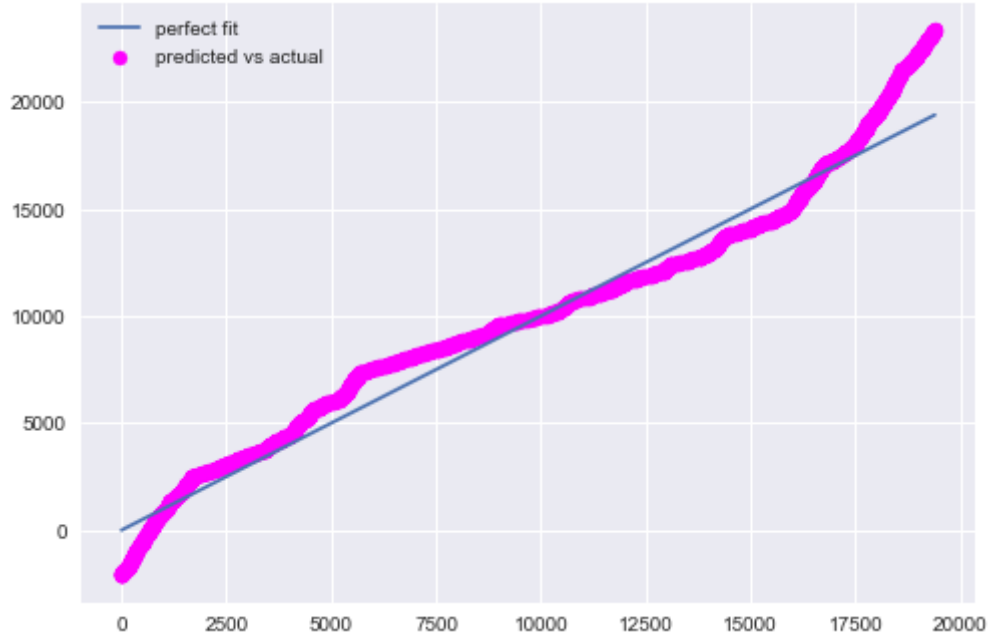
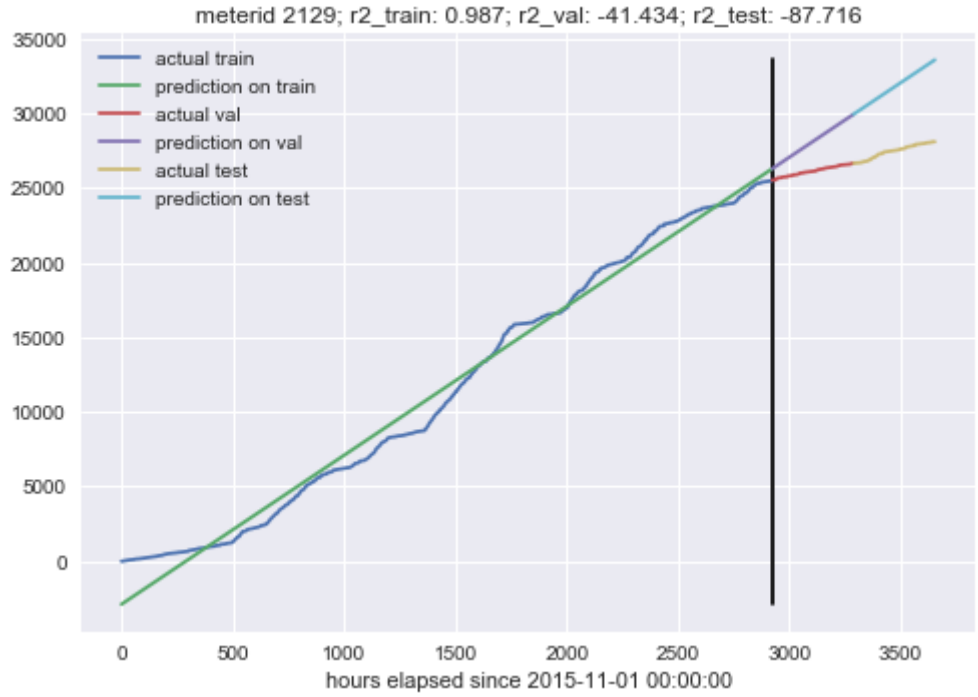
0
0
2000
4000
6000
8000
10000
12000

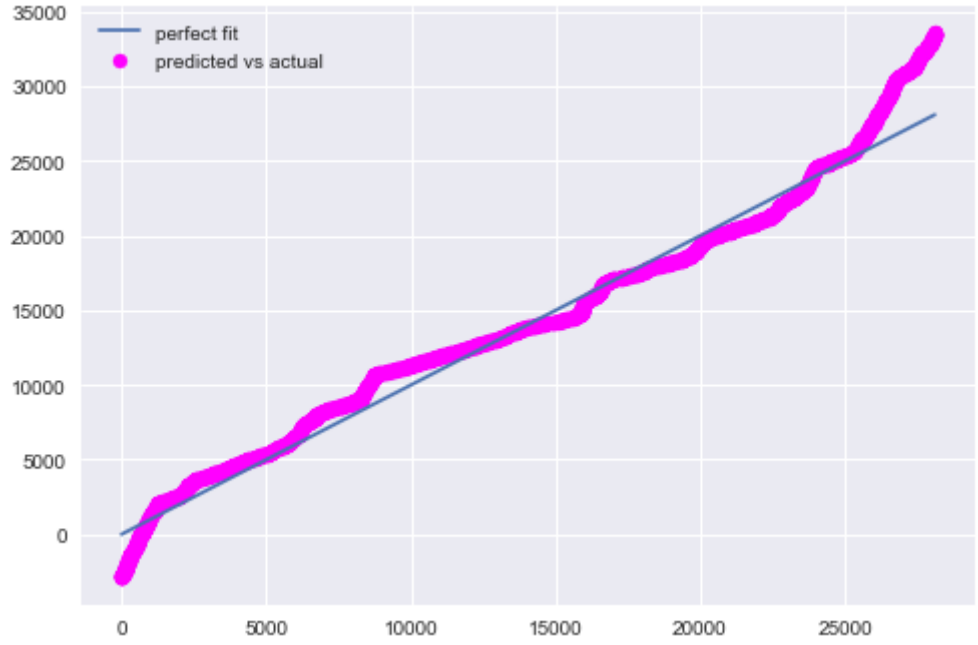

meterid 2072; r2_train: 0.975; r2_val: -215.773; r2_test: -198.096
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

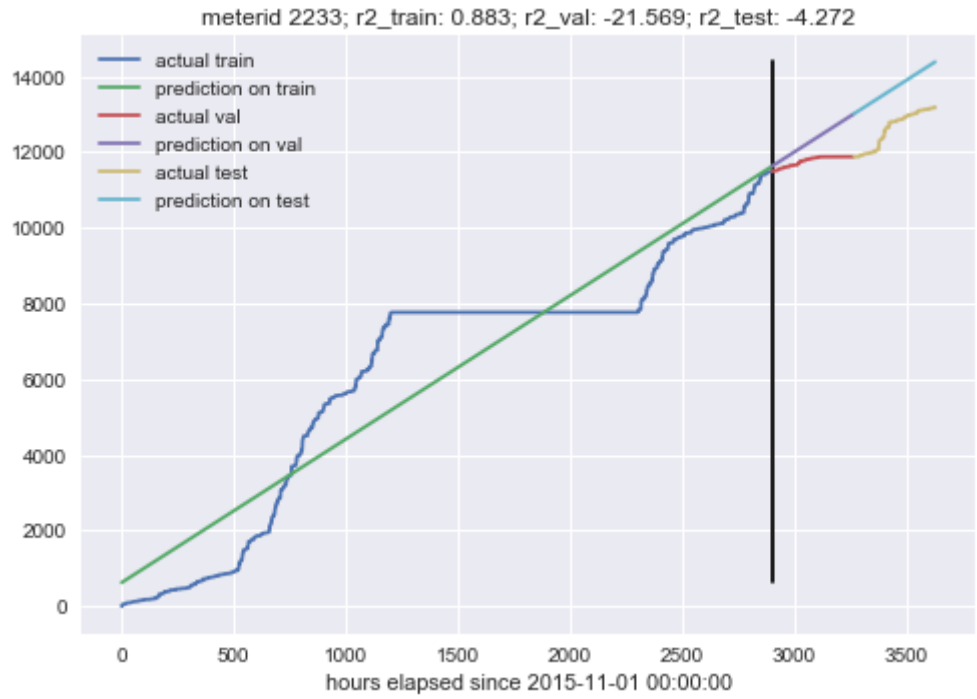

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
20000

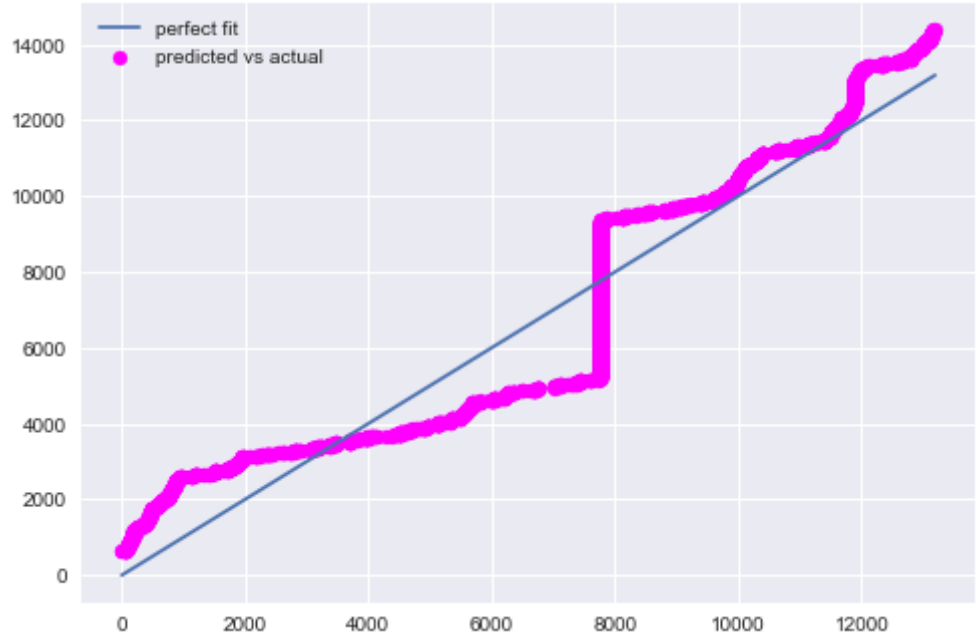

meterid 2094; r2_train: 0.980; r2_val: -37.260; r2_test: -117.753
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

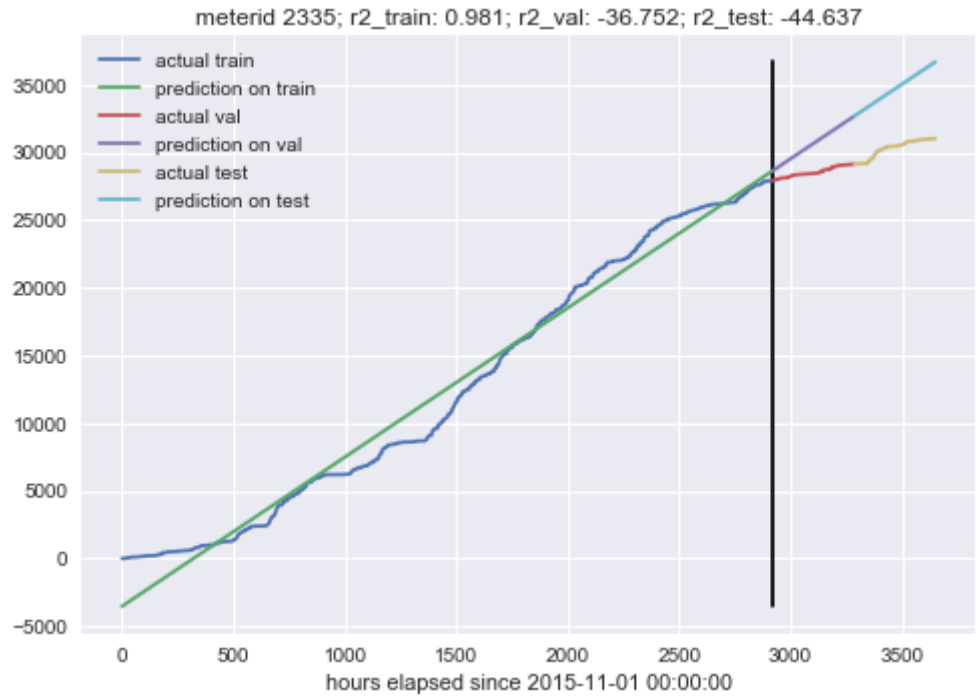

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
20000

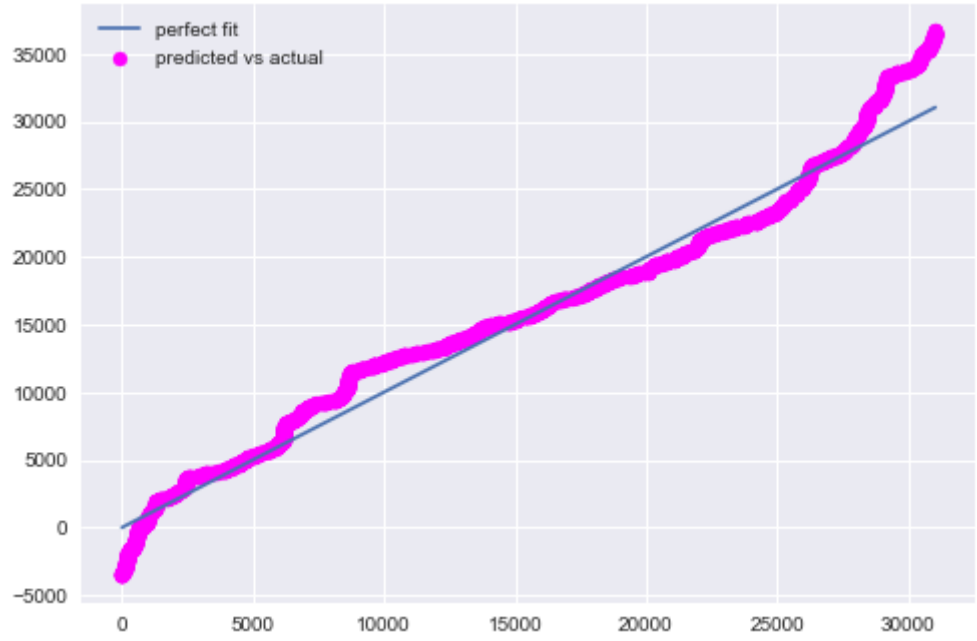

meterid 2129; r2_train: 0.987; r2_val: -41.434; r2_test: -87.716
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

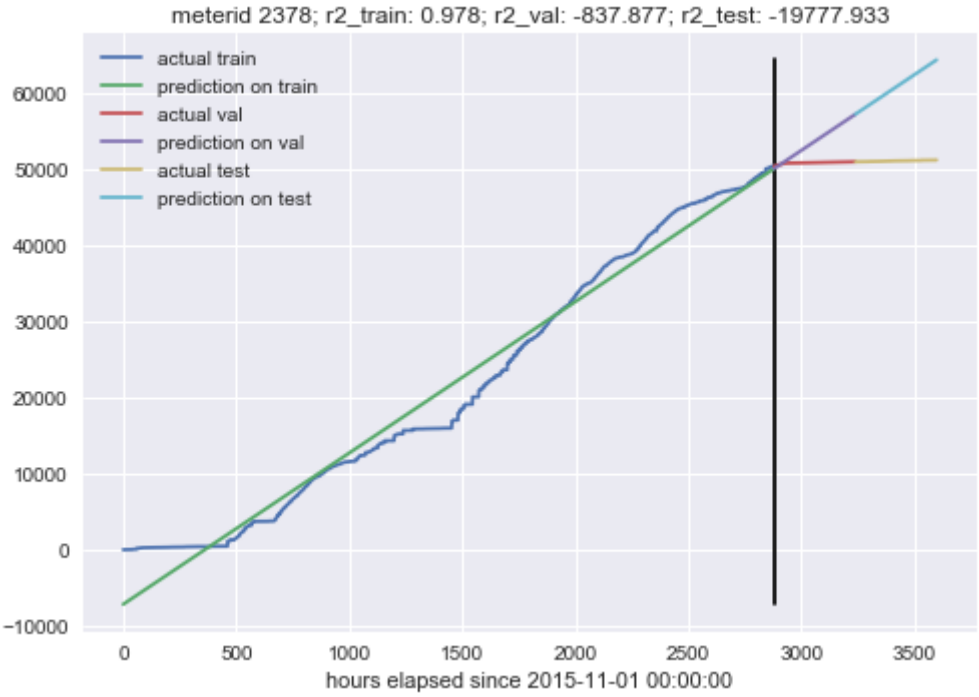

perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000

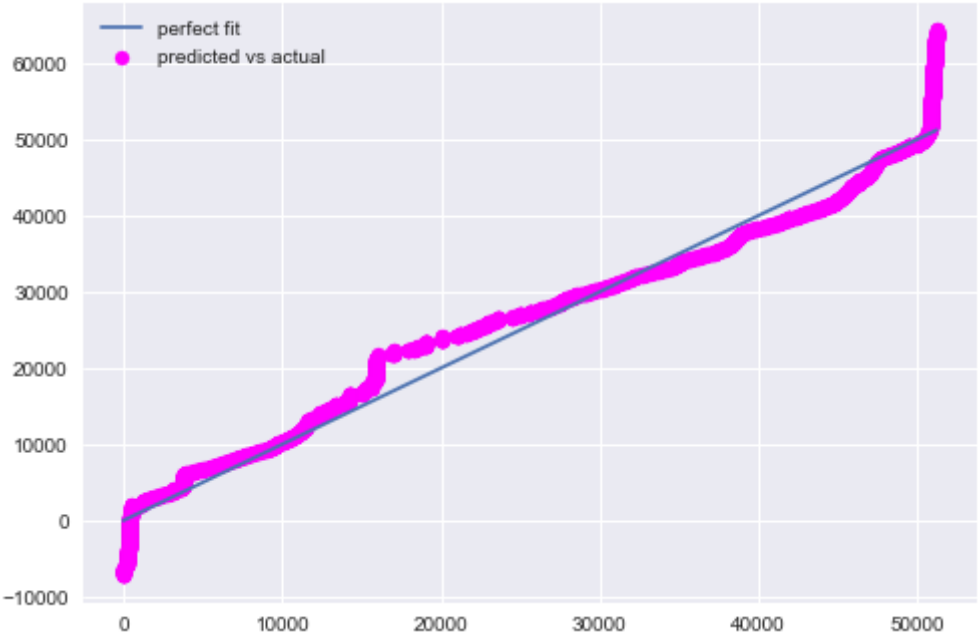

meterid 2233; r2_train: 0.883; r2_val: -21.569; r2_test: -4.272
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

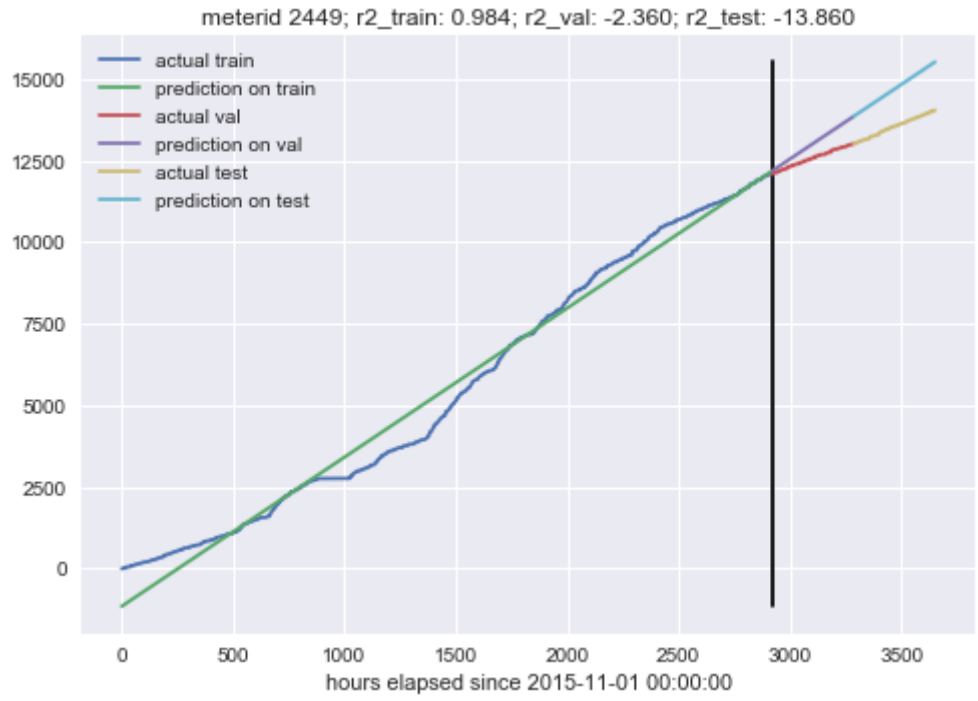

perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000
12000

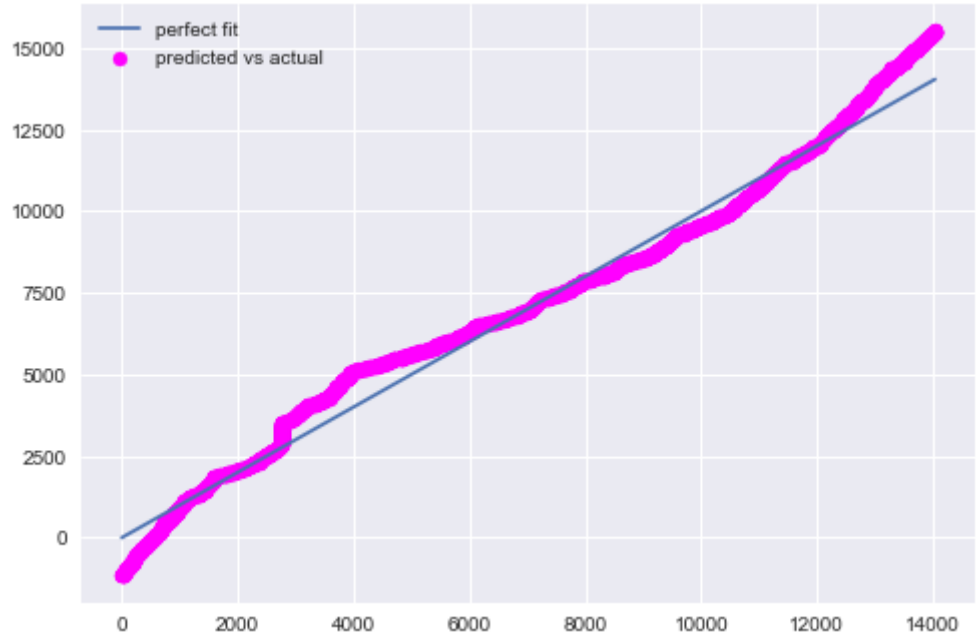

meterid 2335; r2_train: 0.981; r2_val: -36.752; r2_test: -44.637
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

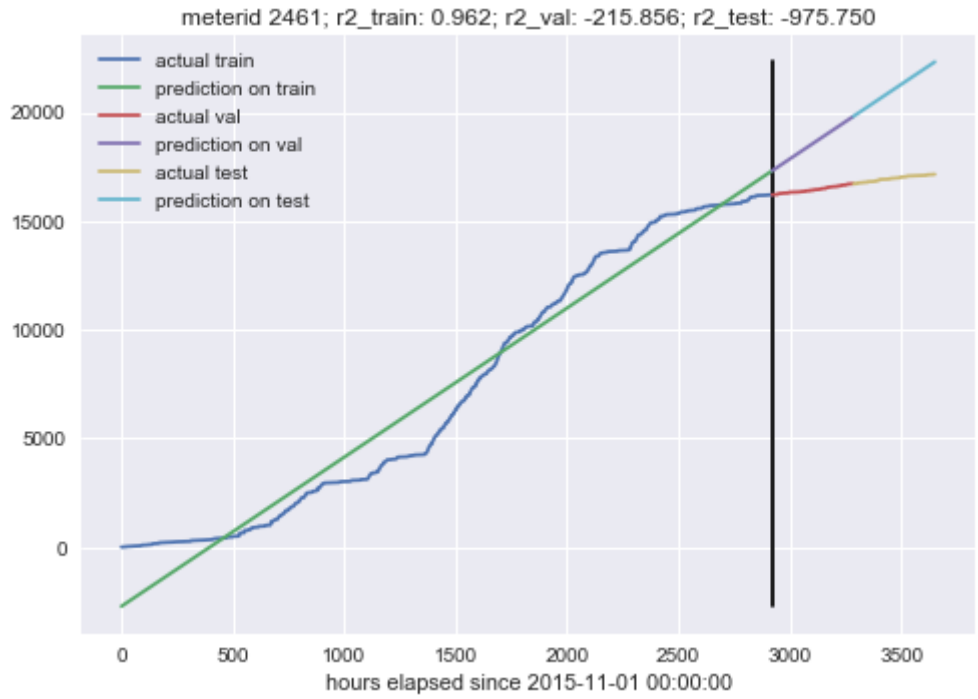

perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000
30000

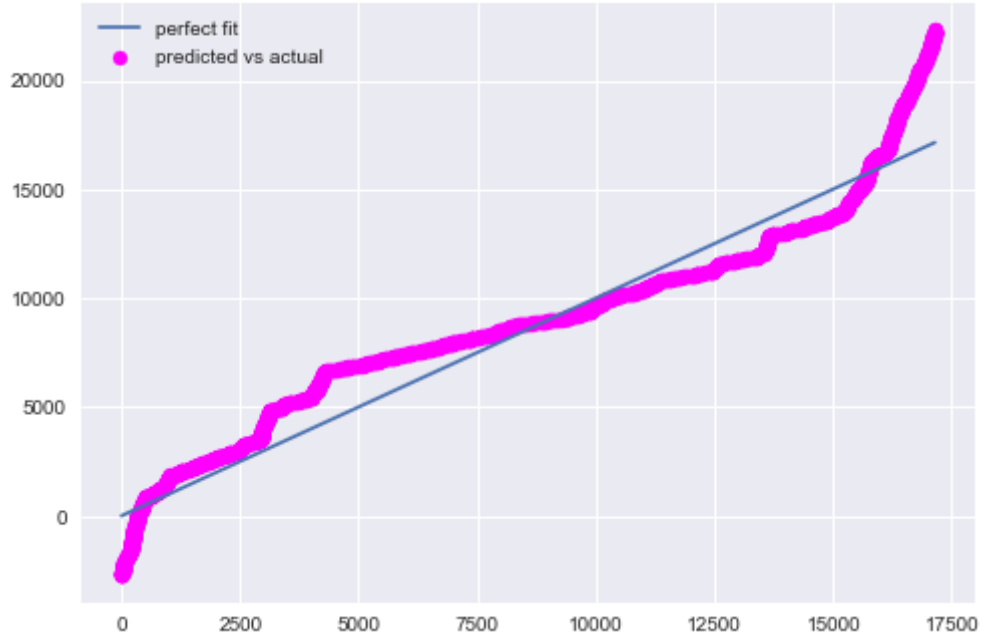

meterid 2378; r2_train: 0.978; r2_val: -837.877; r2_test: -19777.933
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
60000
50000
40000
30000
20000
10000
0
−10000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

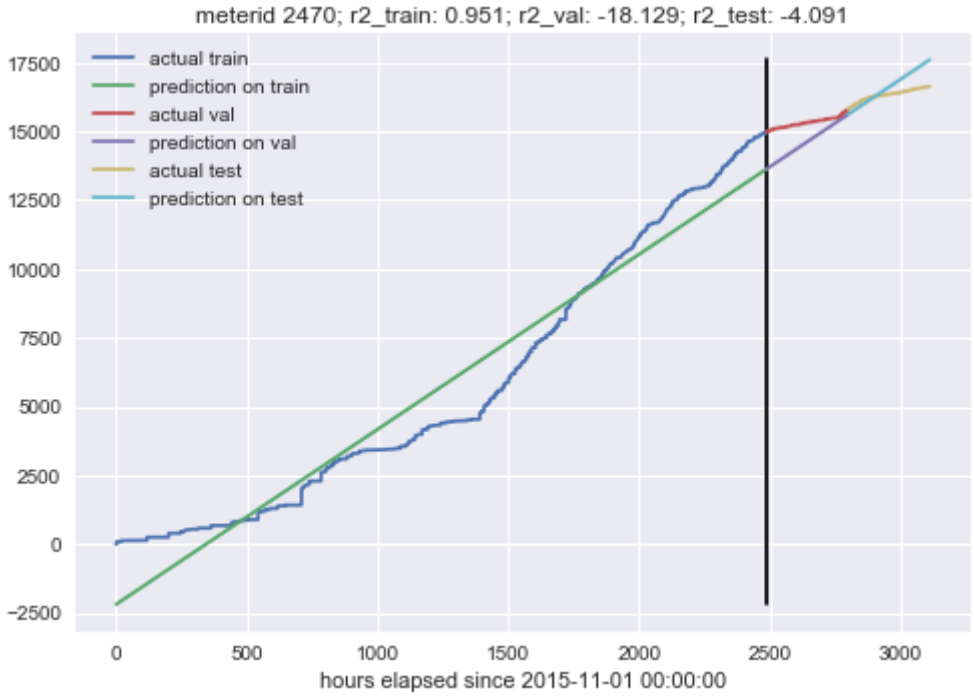

perfect fit
predicted vs actual
60000
50000
40000
30000
20000
10000
0
−10000
0
10000
20000
30000
40000
50000

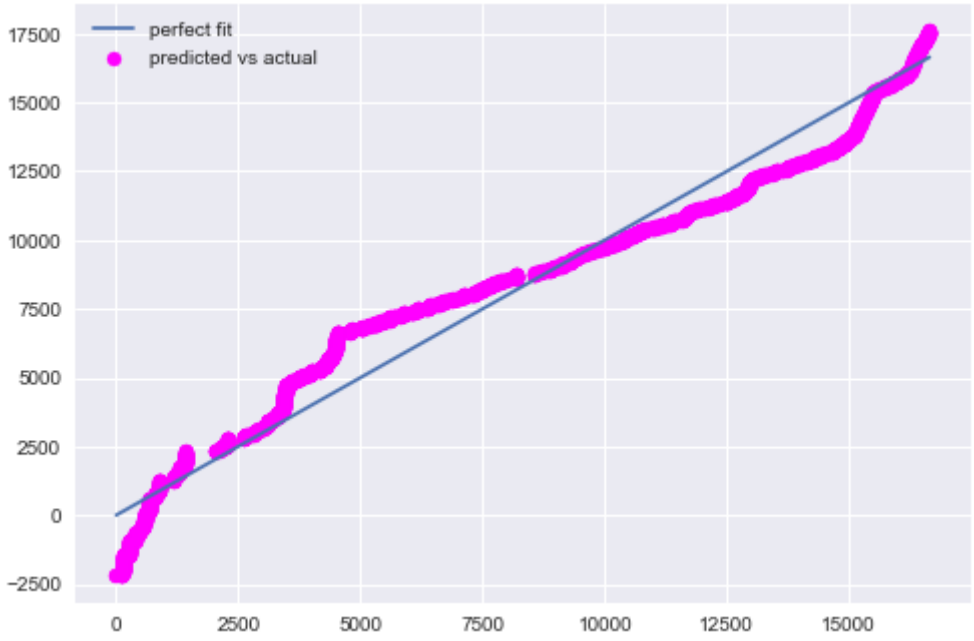

meterid 2449; r2_train: 0.984; r2_val: -2.360; r2_test: -13.860
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

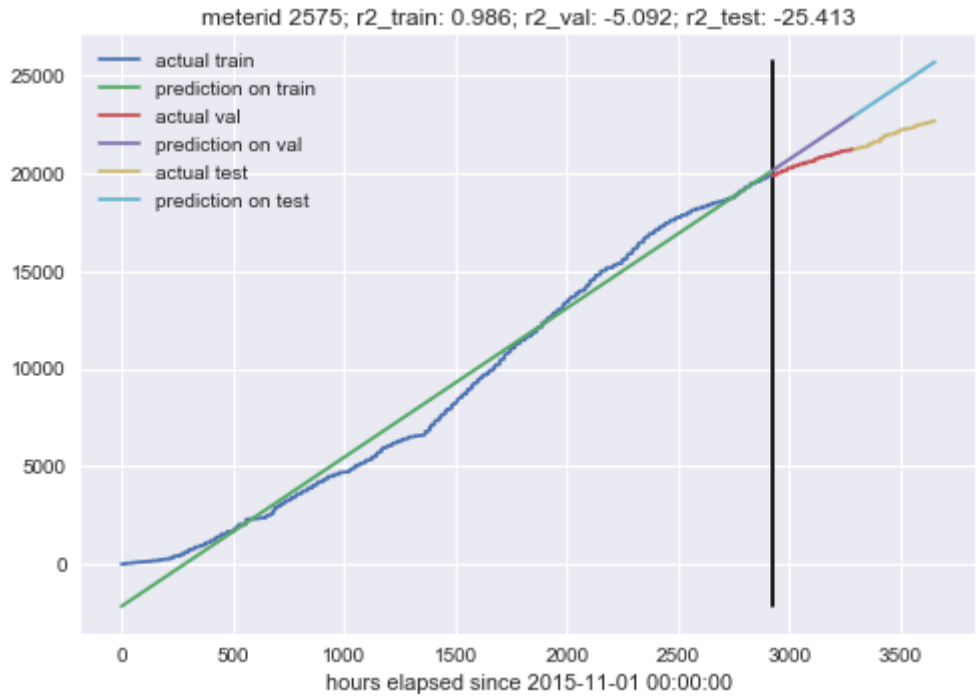

perfect fit
predicted vs actual
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000

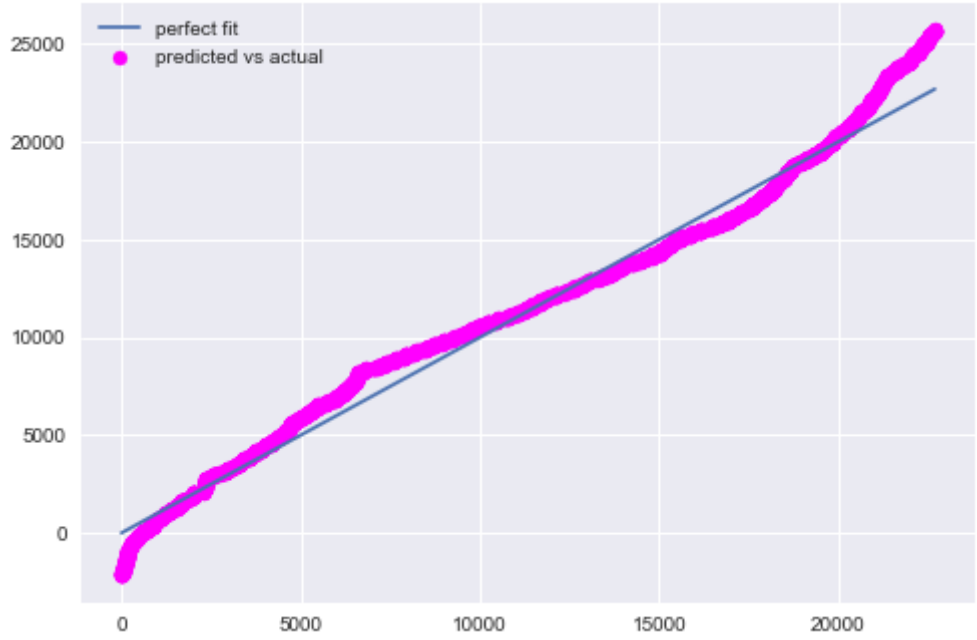

meterid 2461; r2_train: 0.962; r2_val: -215.856; r2_test: -975.750
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

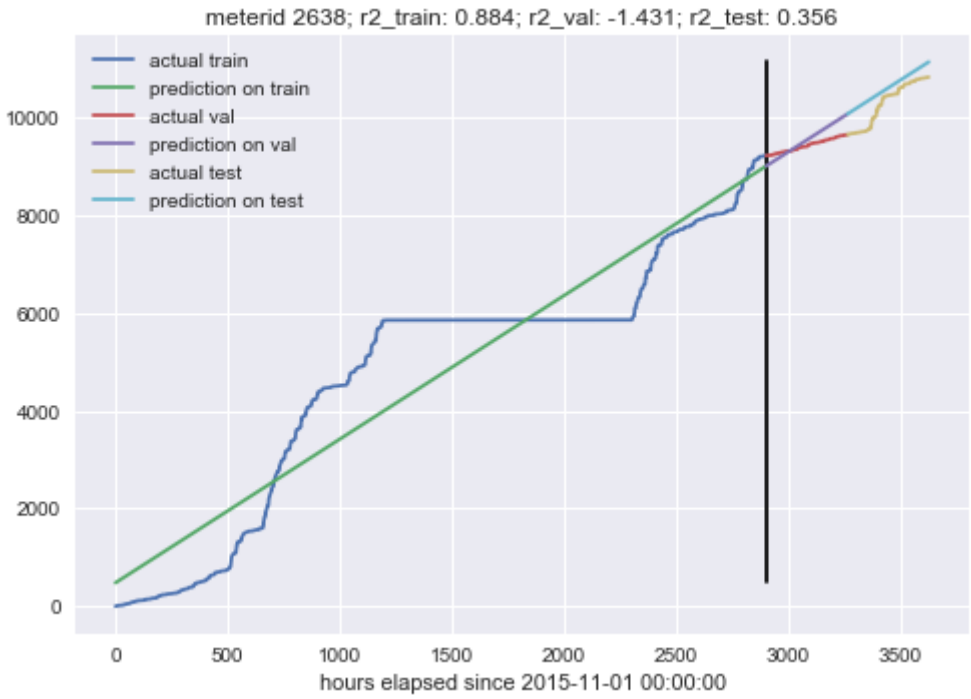

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

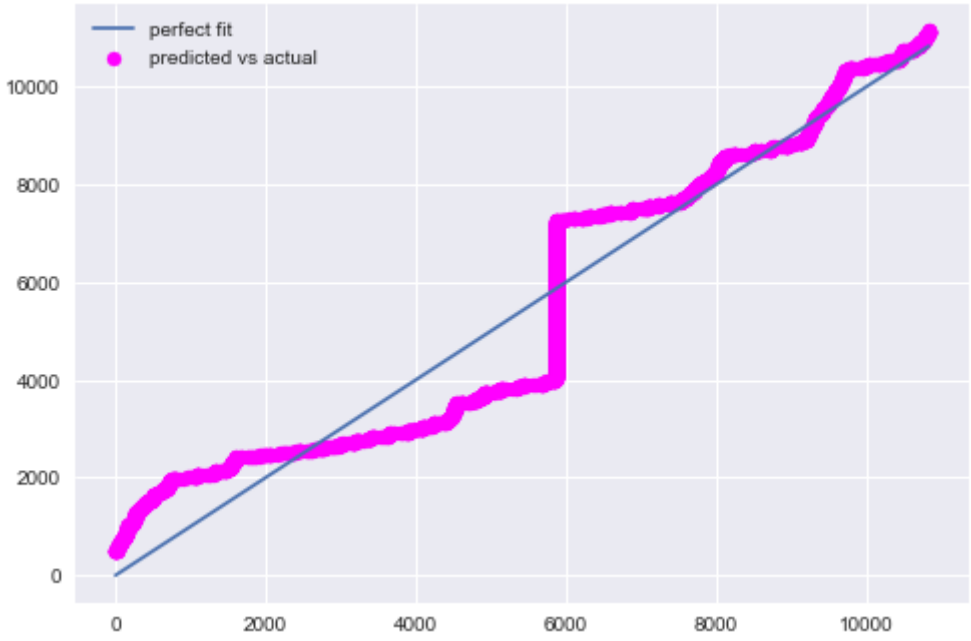

meterid 2470; r2_train: 0.951; r2_val: -18.129; r2_test: -4.091
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

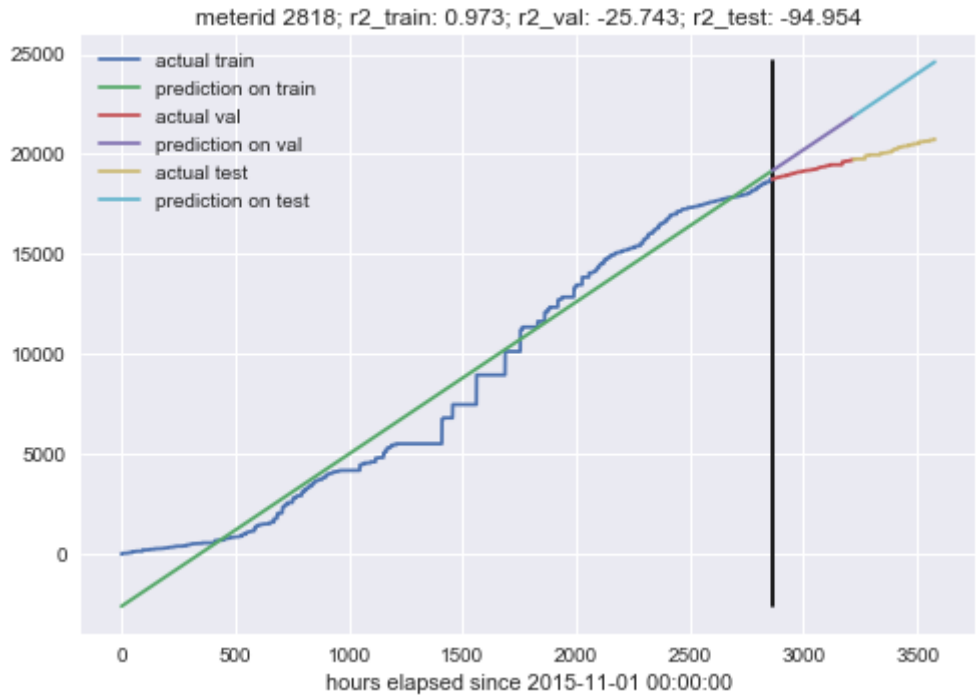

perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
2500
5000
7500
10000
12500
15000

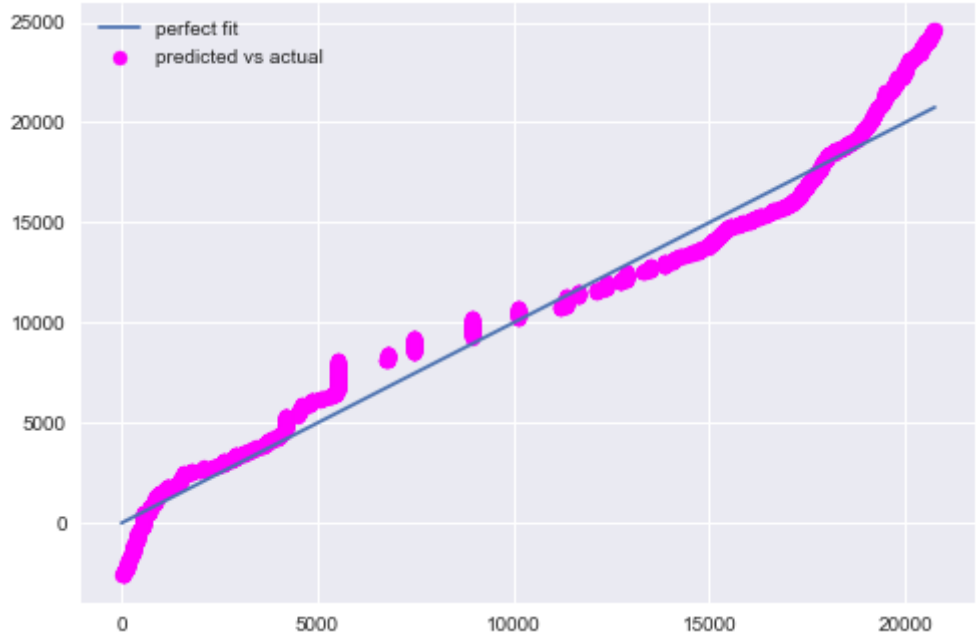

meterid 2575; r2_train: 0.986; r2_val: -5.092; r2_test: -25.413
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

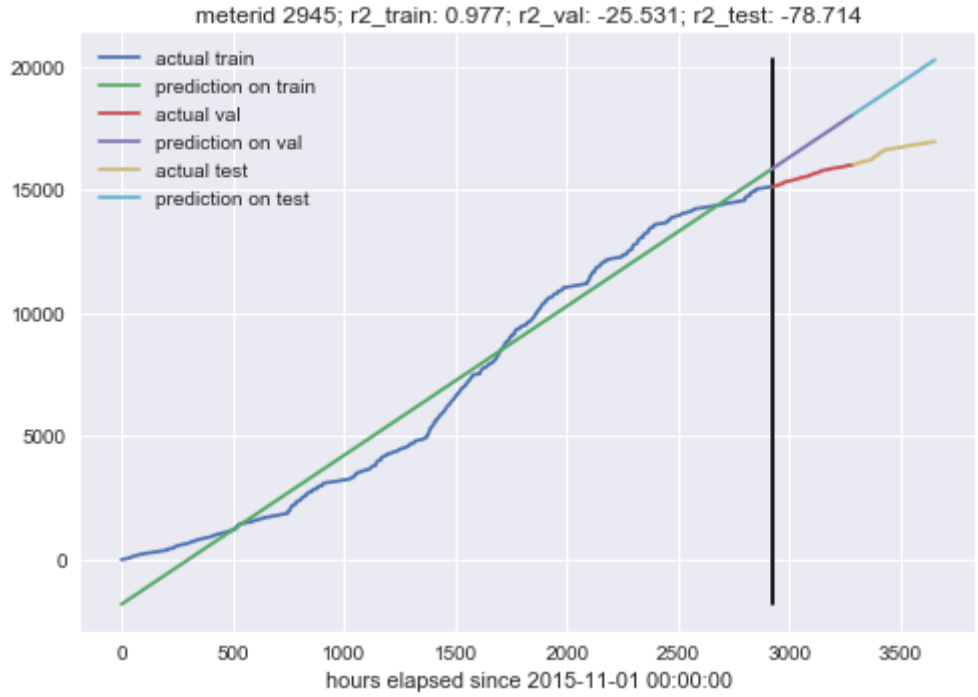

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

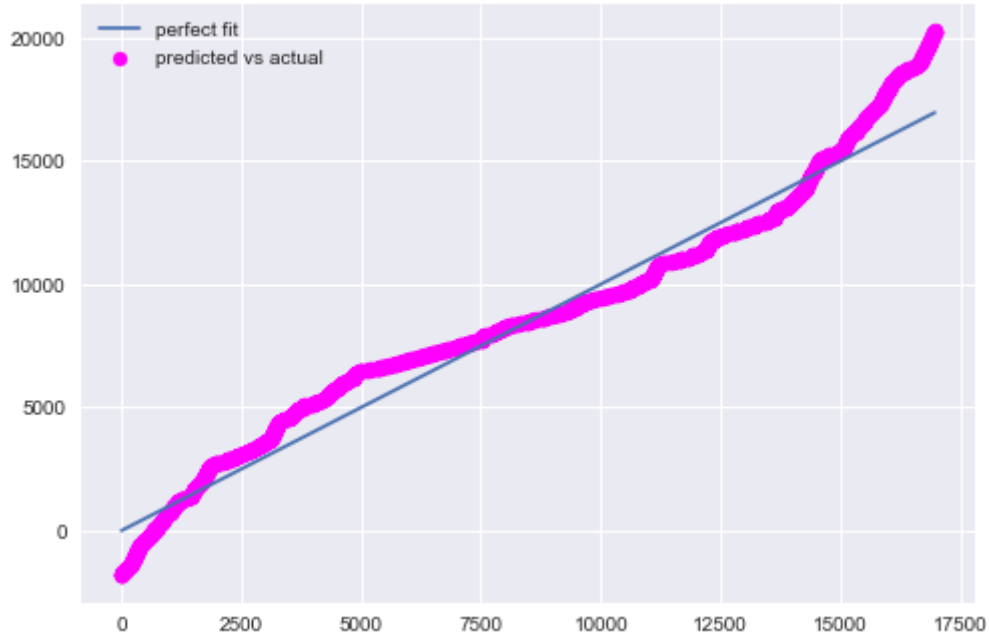

meterid 2638; r2_train: 0.884; r2_val: -1.431; r2_test: 0.356
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

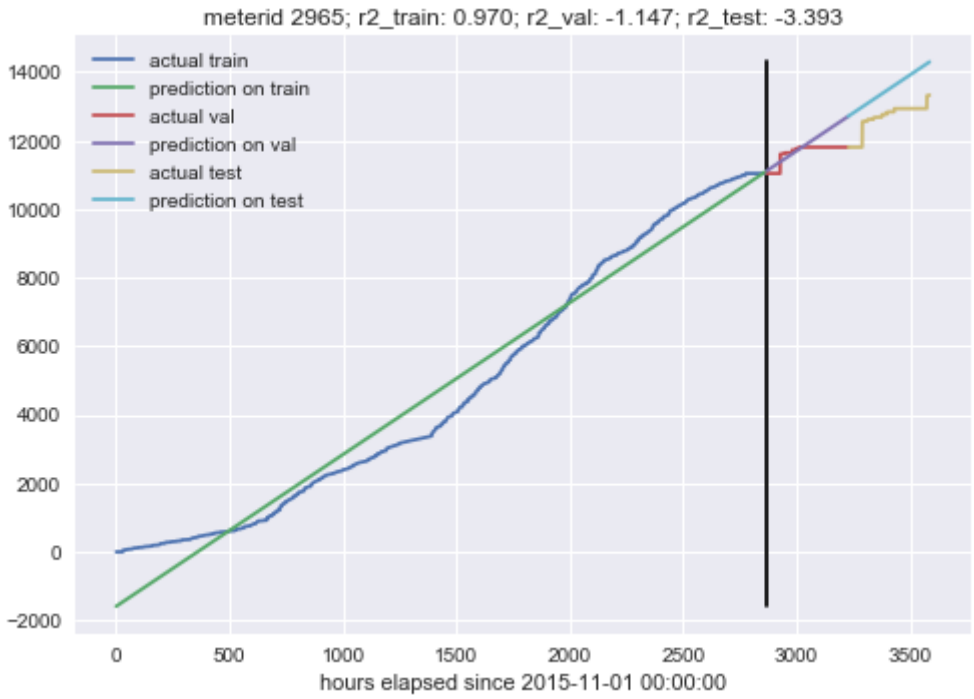

perfect fit
predicted vs actual
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000

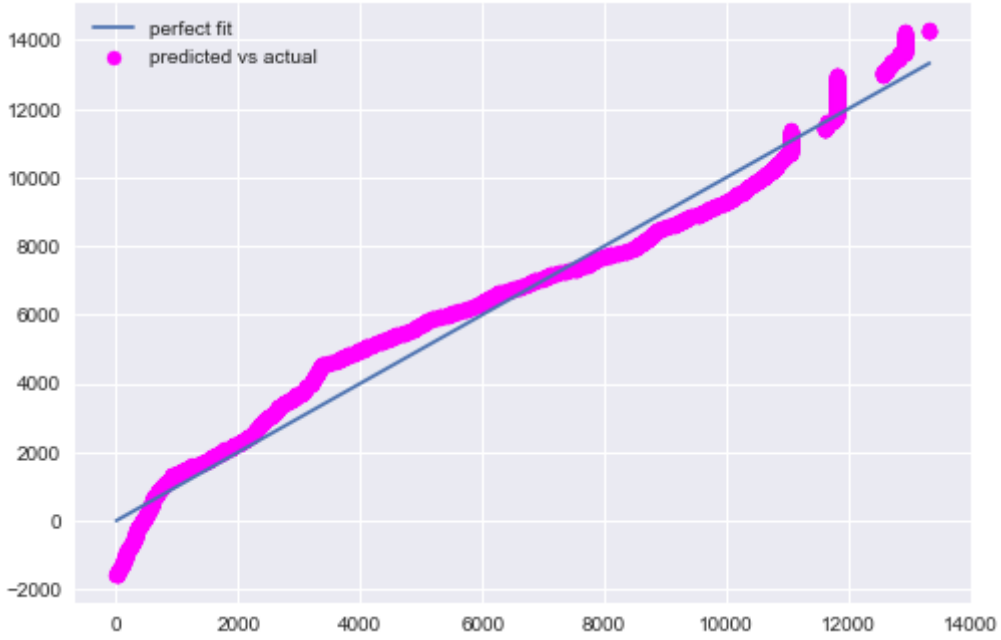

meterid 2818; r2_train: 0.973; r2_val: -25.743; r2_test: -94.954
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

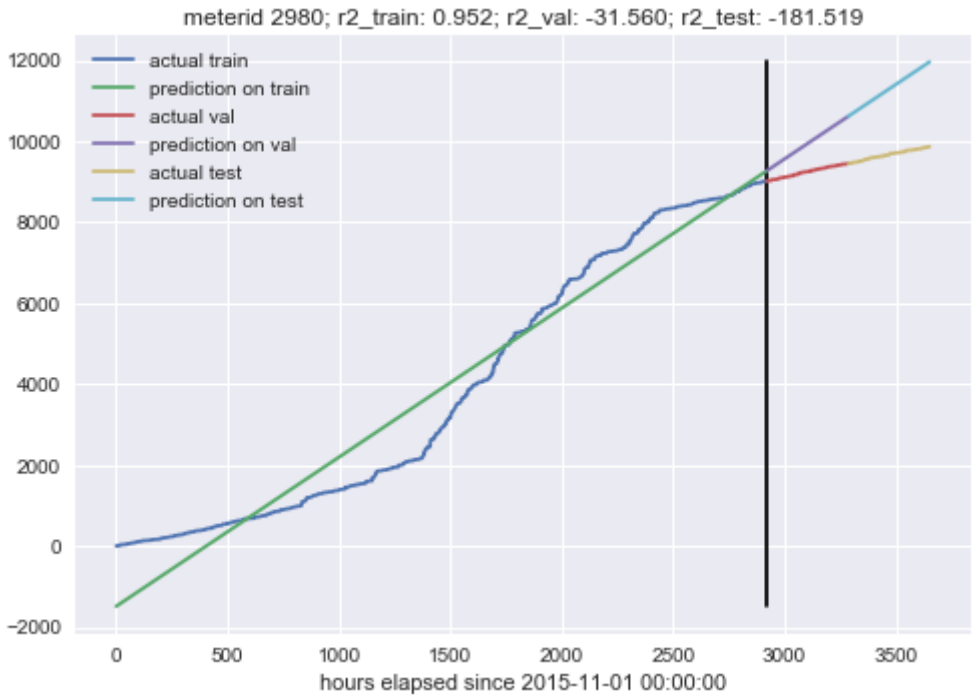

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

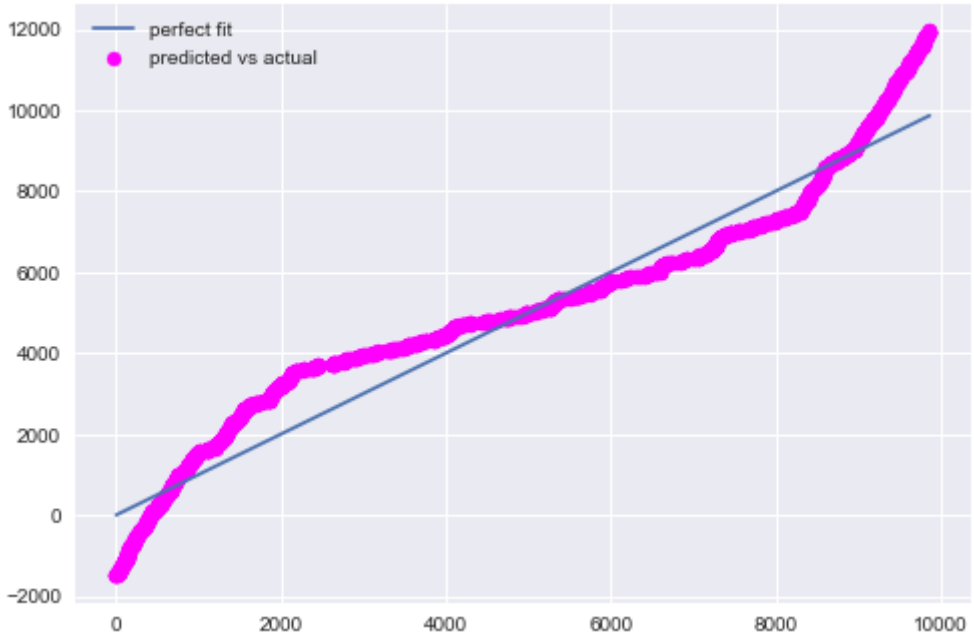

meterid 2945; r2_train: 0.977; r2_val: -25.531; r2_test: -78.714
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

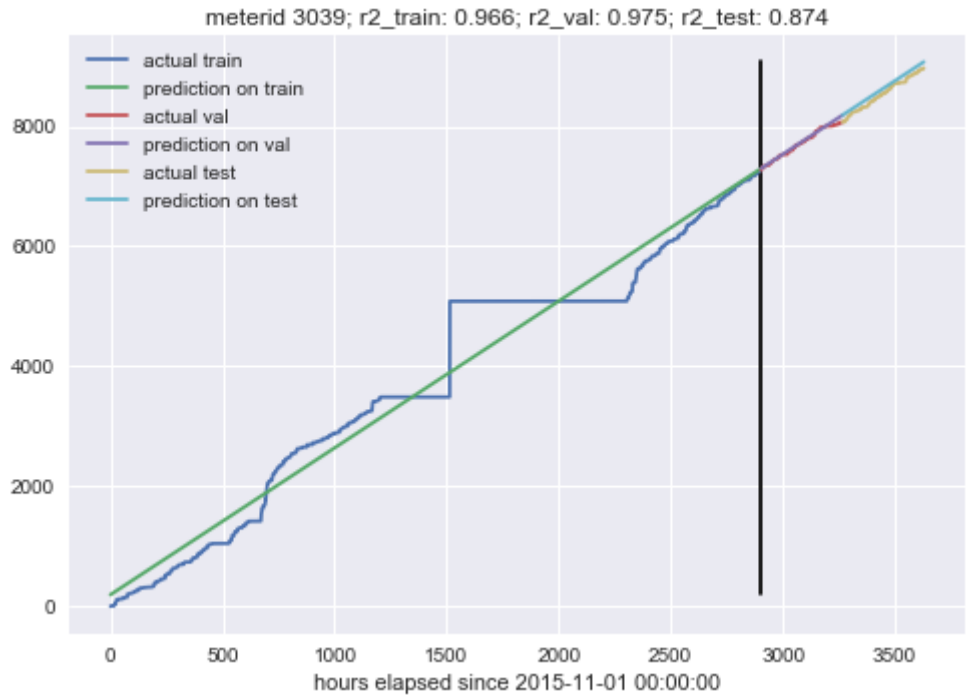

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

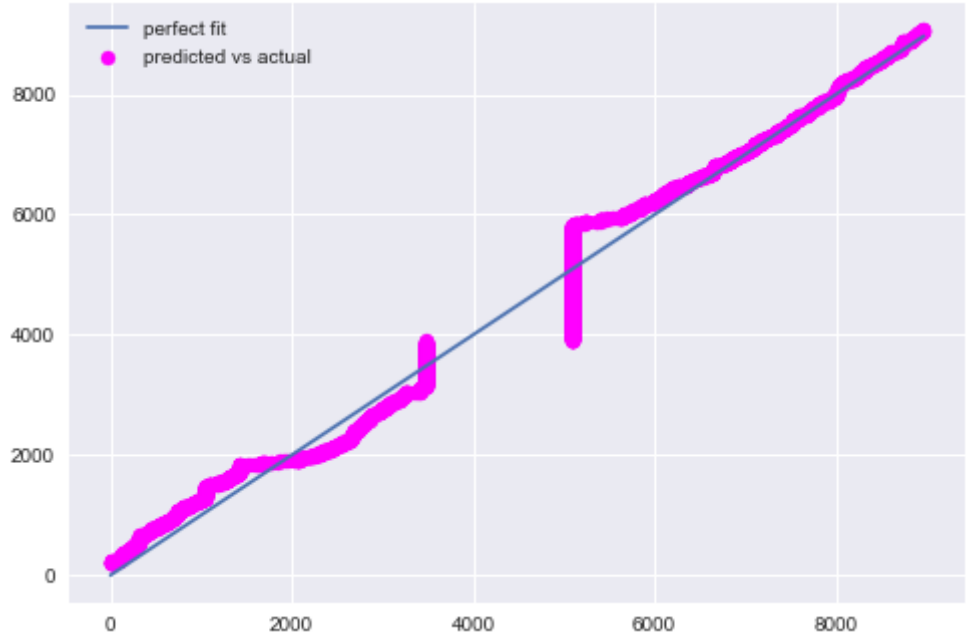

meterid 2965; r2_train: 0.970; r2_val: -1.147; r2_test: -3.393
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000
12000
14000


meterid 2980; r2_train: 0.952; r2_val: -31.560; r2_test: -181.519
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000


meterid 3039; r2_train: 0.966; r2_val: 0.975; r2_test: 0.874
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
8000
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4000
2000
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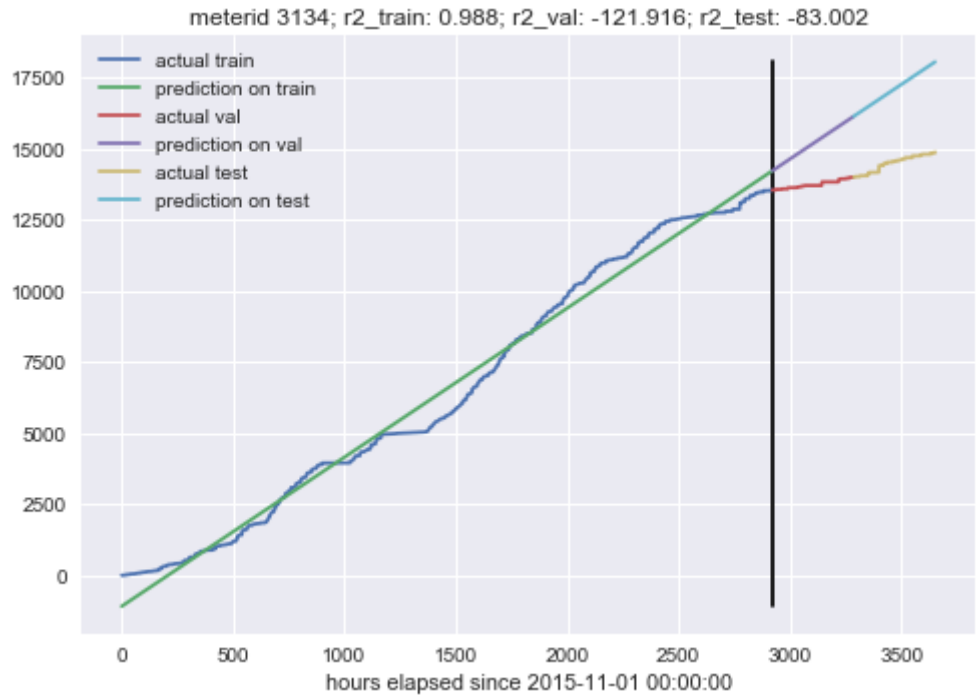
6000
8000


meterid 3134; r2_train: 0.988; r2_val: -121.916; r2_test: -83.002
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
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500
1000
1500
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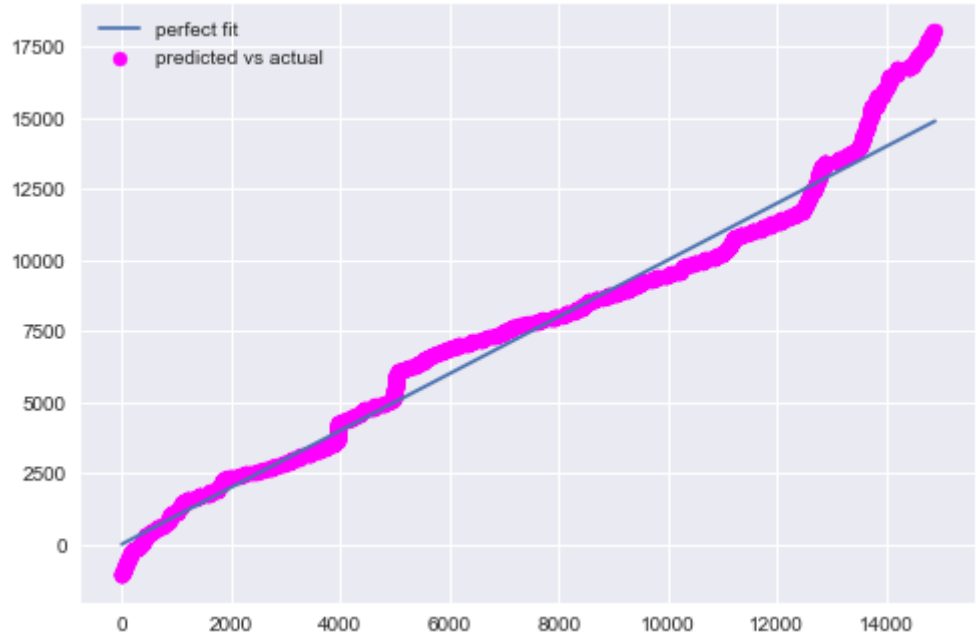
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
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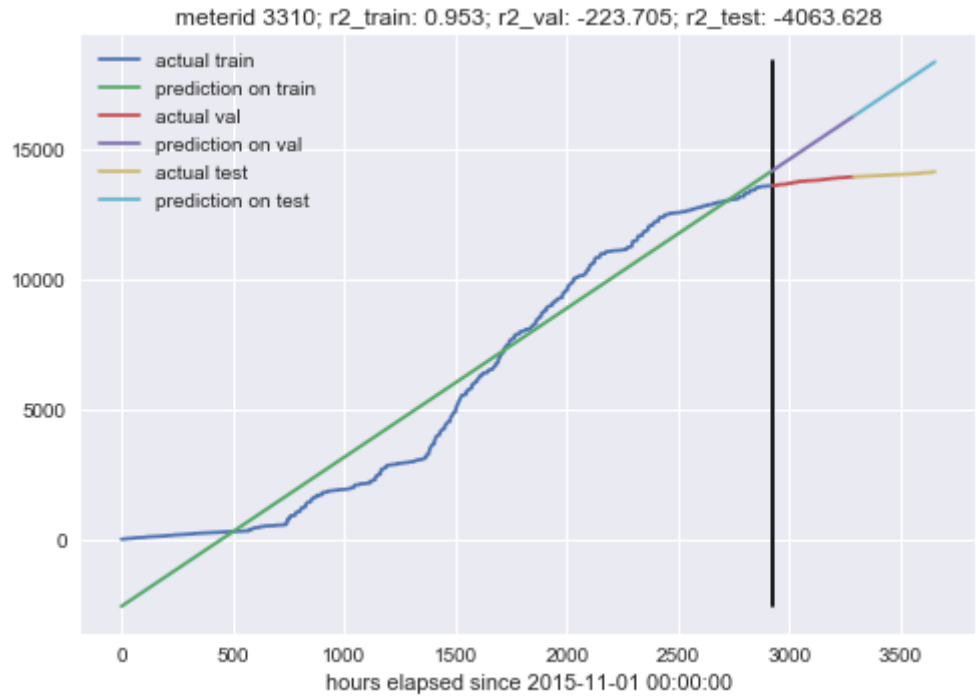
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000


meterid 3310; r2_train: 0.953; r2_val: -223.705; r2_test: -4063.628
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
10000
5000
0
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500
1000
1500
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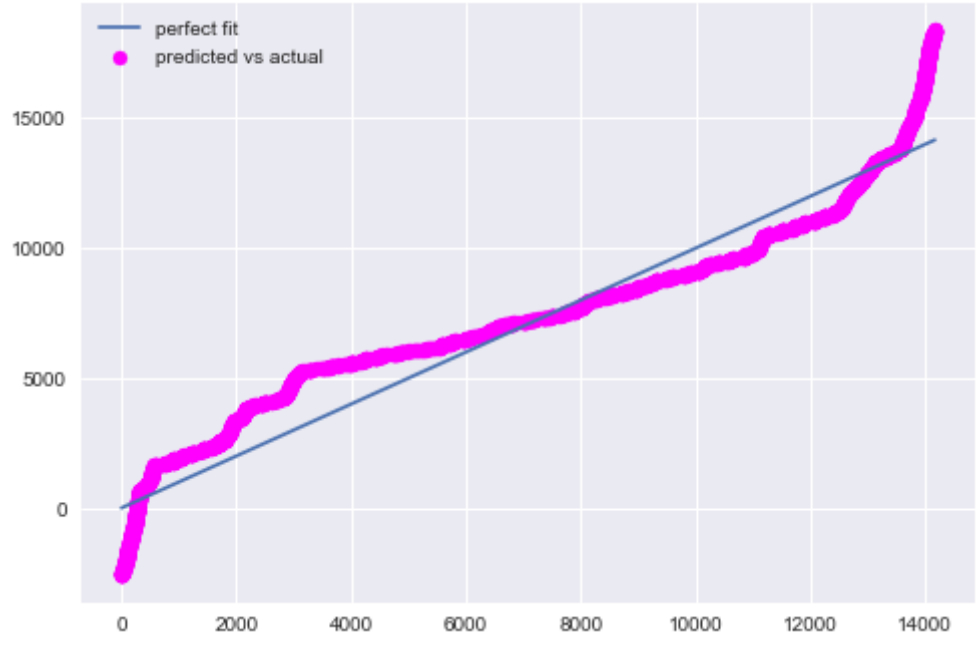
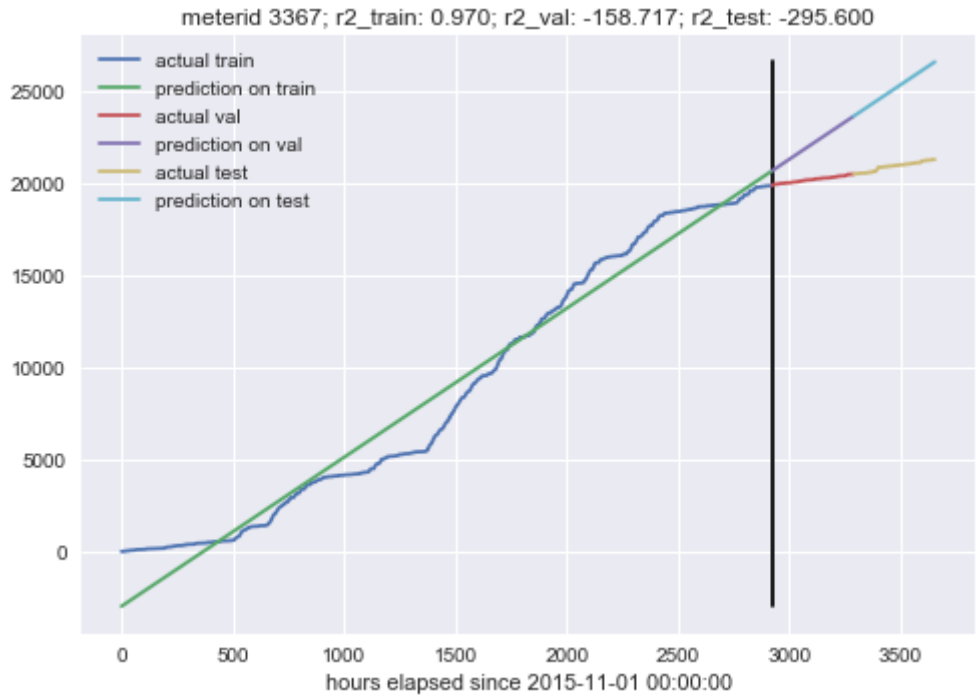
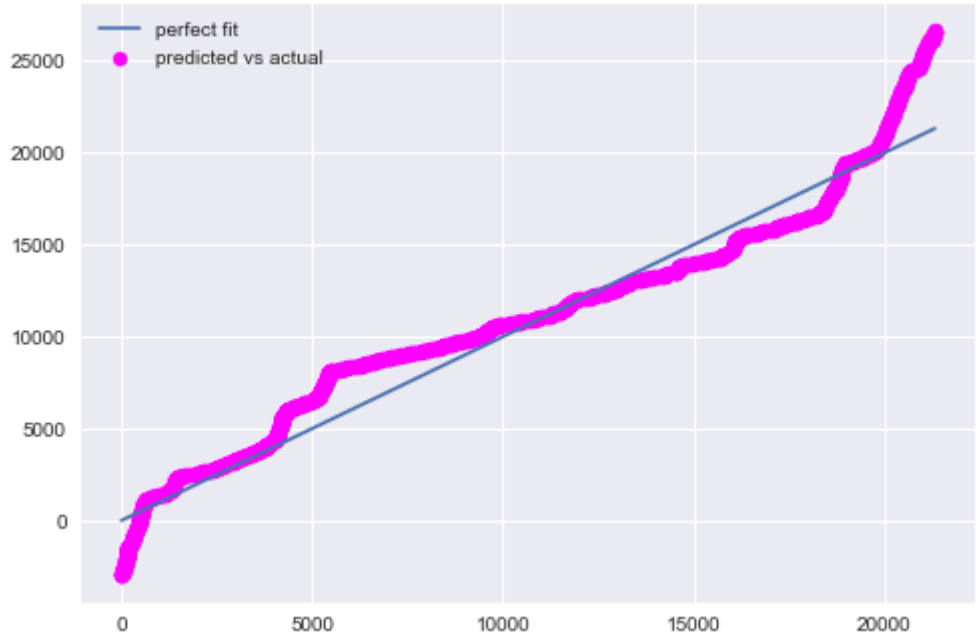
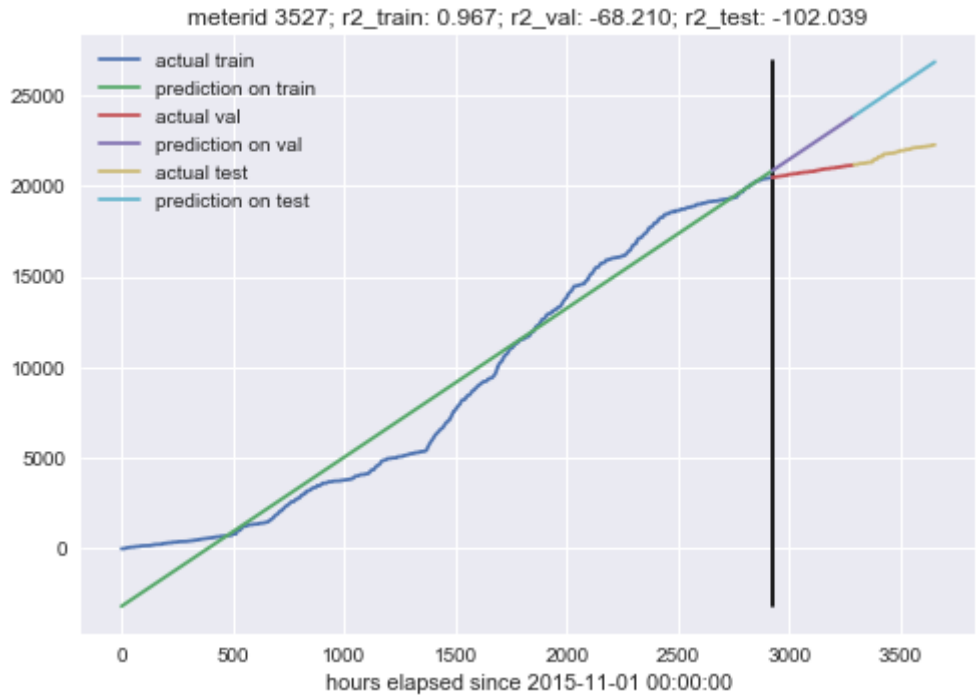
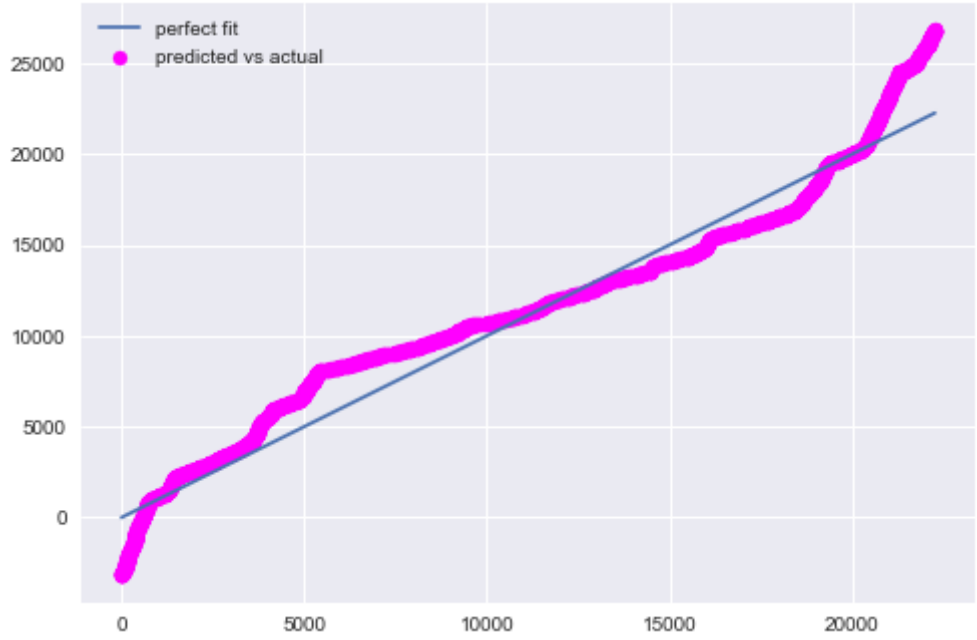
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

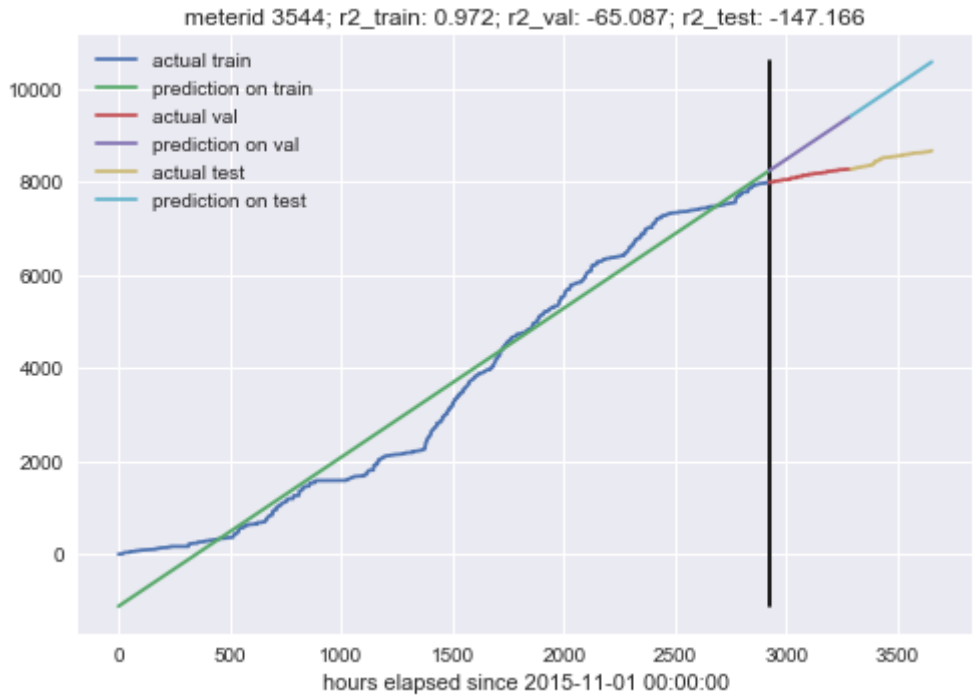

perfect fit
predicted vs actual
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000

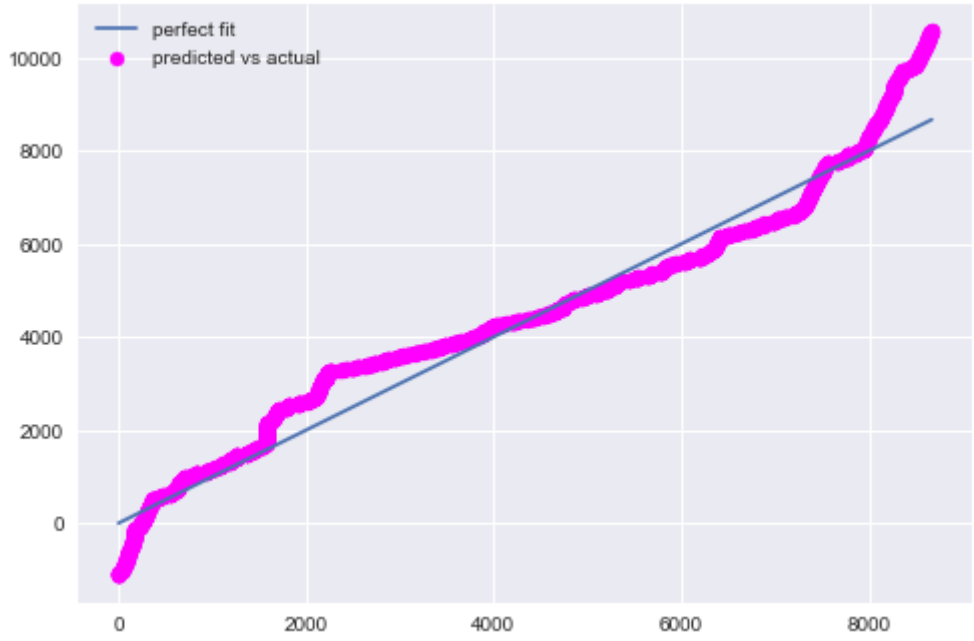

meterid 3367; r2_train: 0.970; r2_val: -158.717; r2_test: -295.600
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

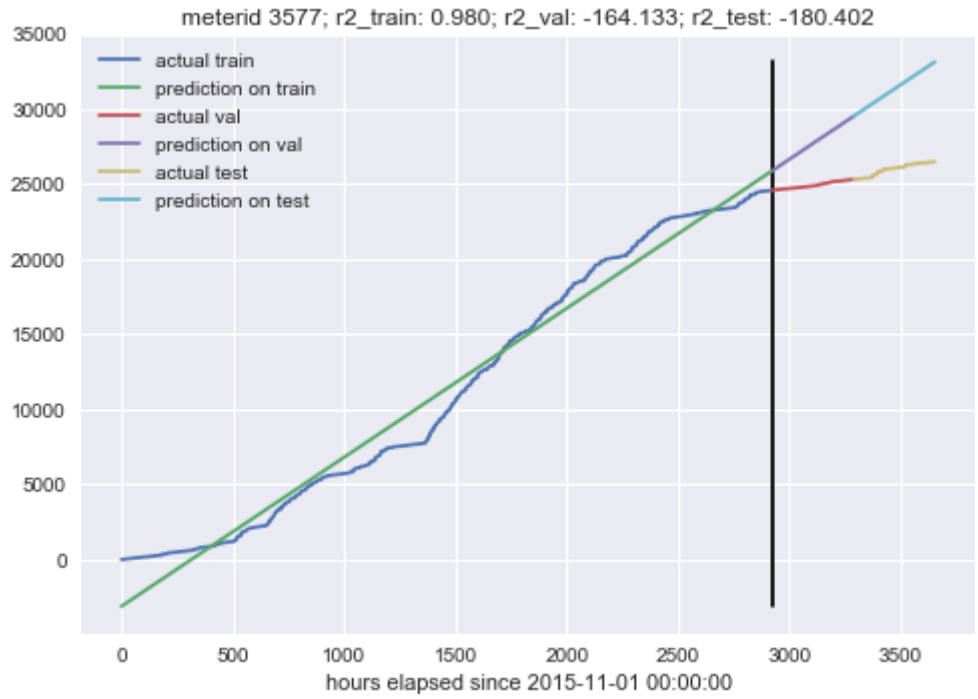

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

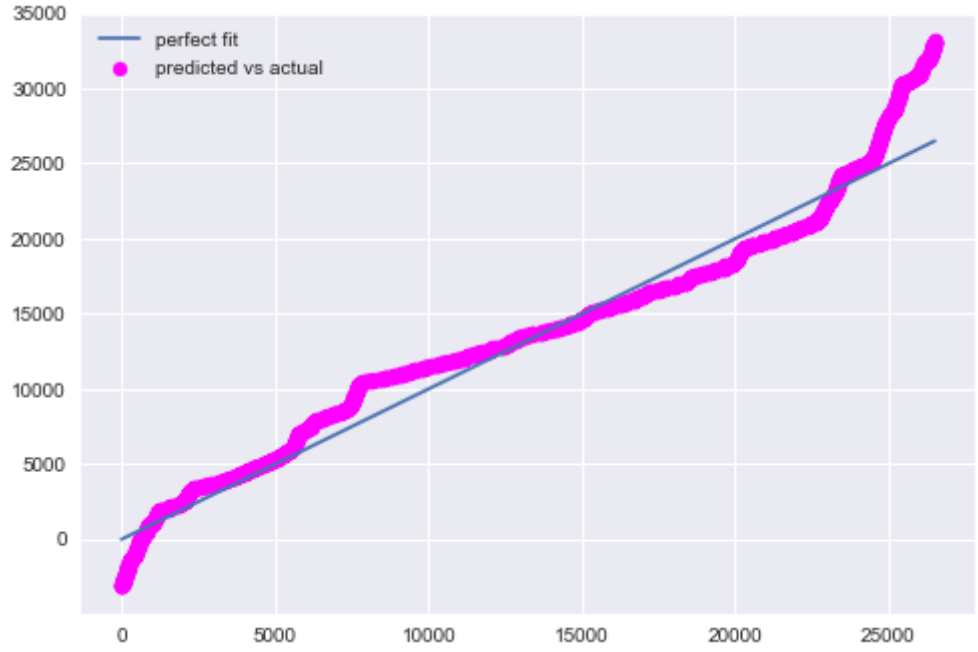

meterid 3527; r2_train: 0.967; r2_val: -68.210; r2_test: -102.039
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

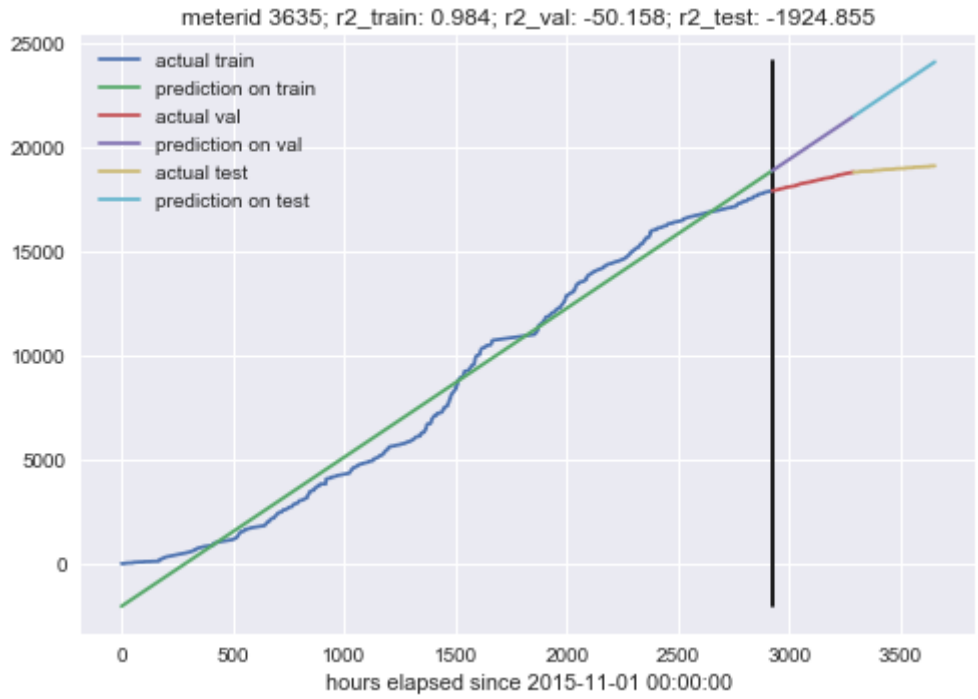

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

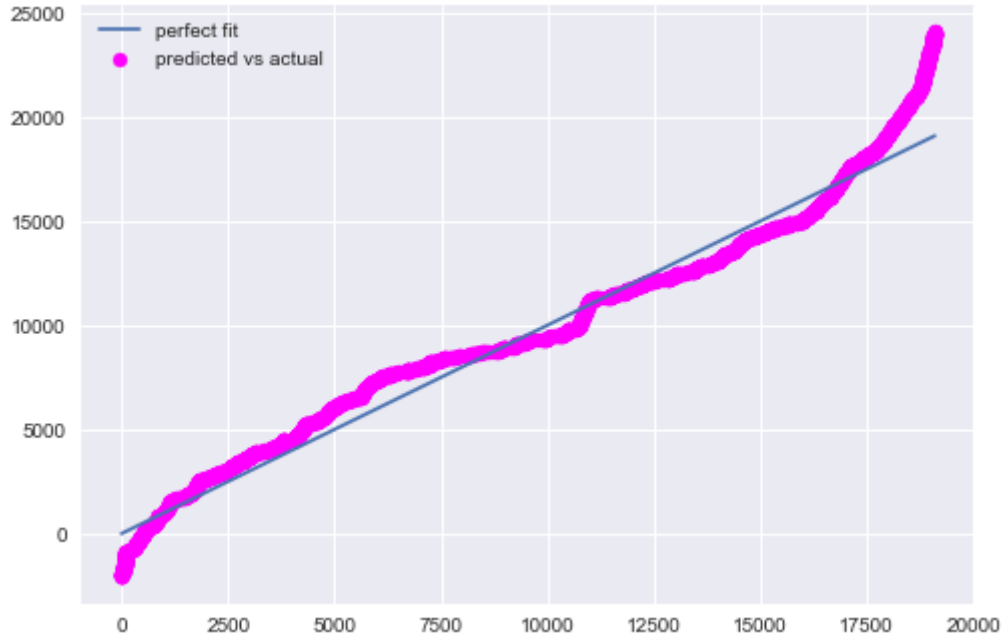

meterid 3544; r2_train: 0.972; r2_val: -65.087; r2_test: -147.166
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000


meterid 3577; r2_train: 0.980; r2_val: -164.133; r2_test: -180.402
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000


meterid 3635; r2_train: 0.984; r2_val: -50.158; r2_test: -1924.855
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
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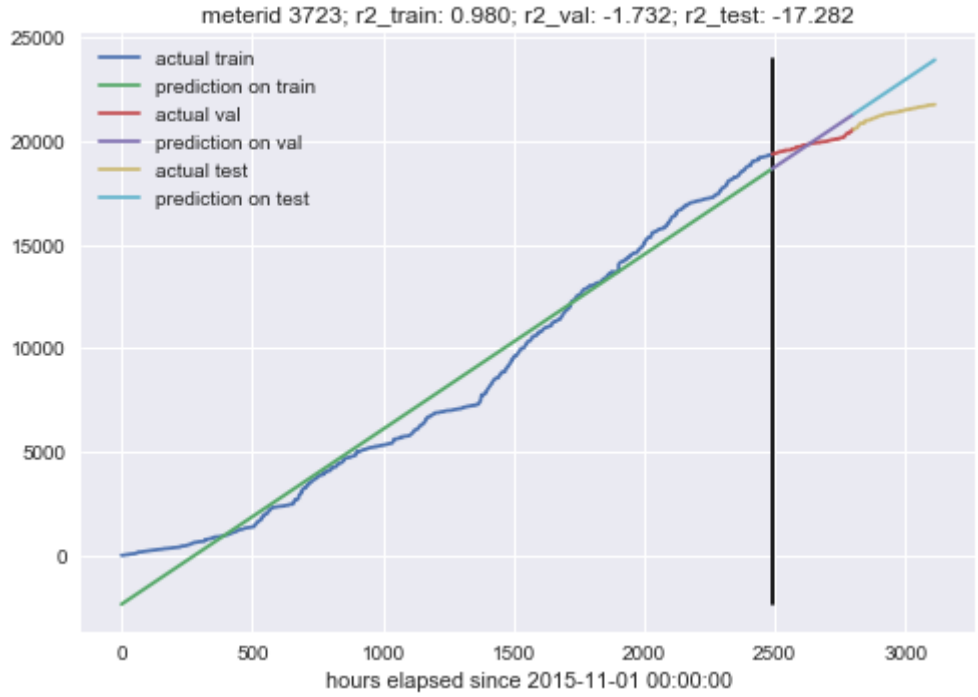
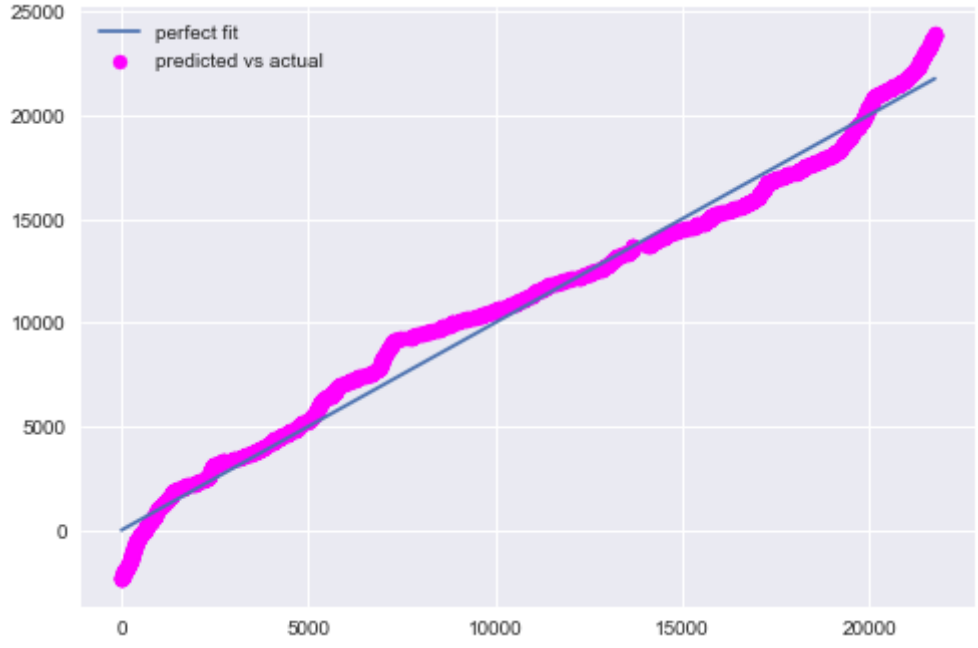
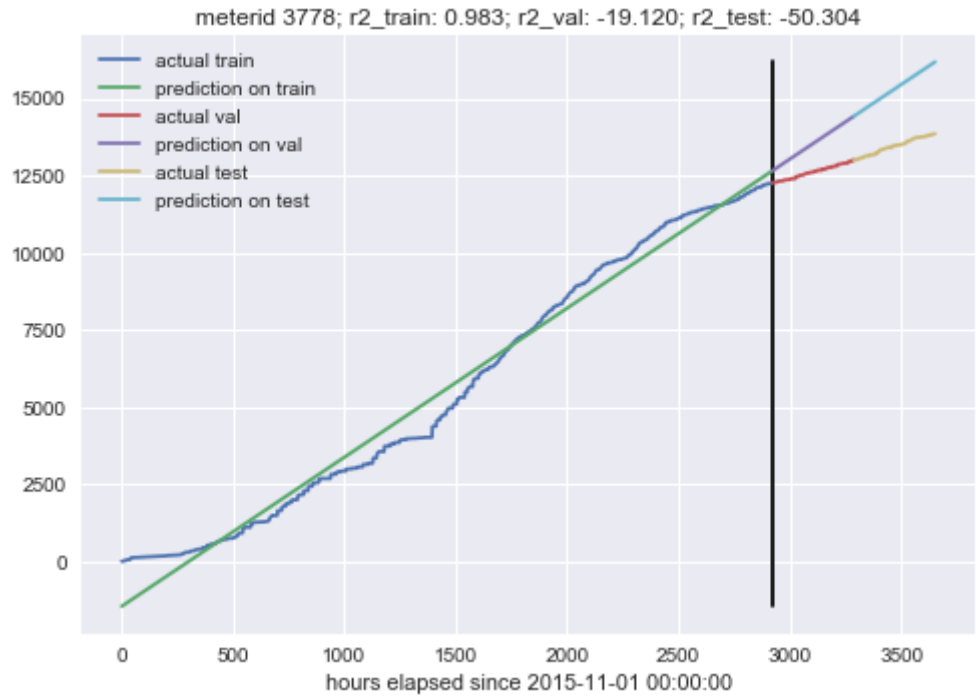
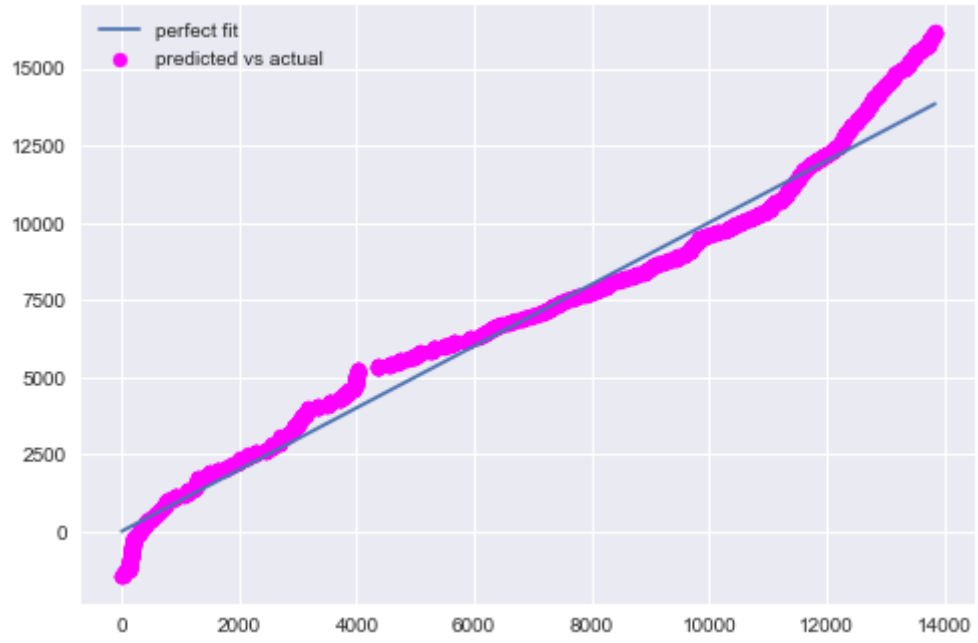
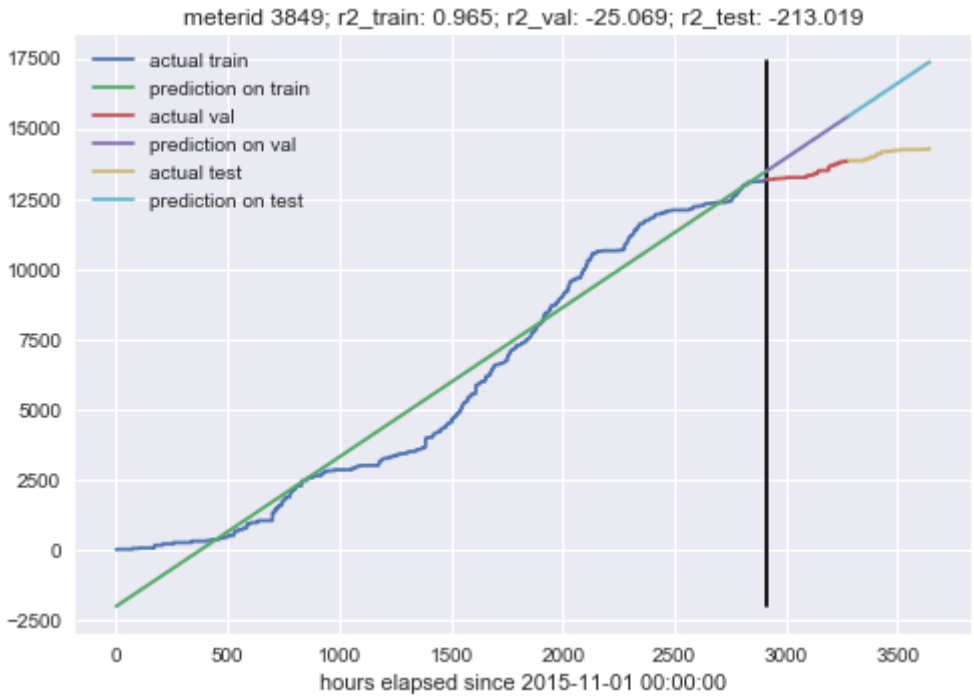
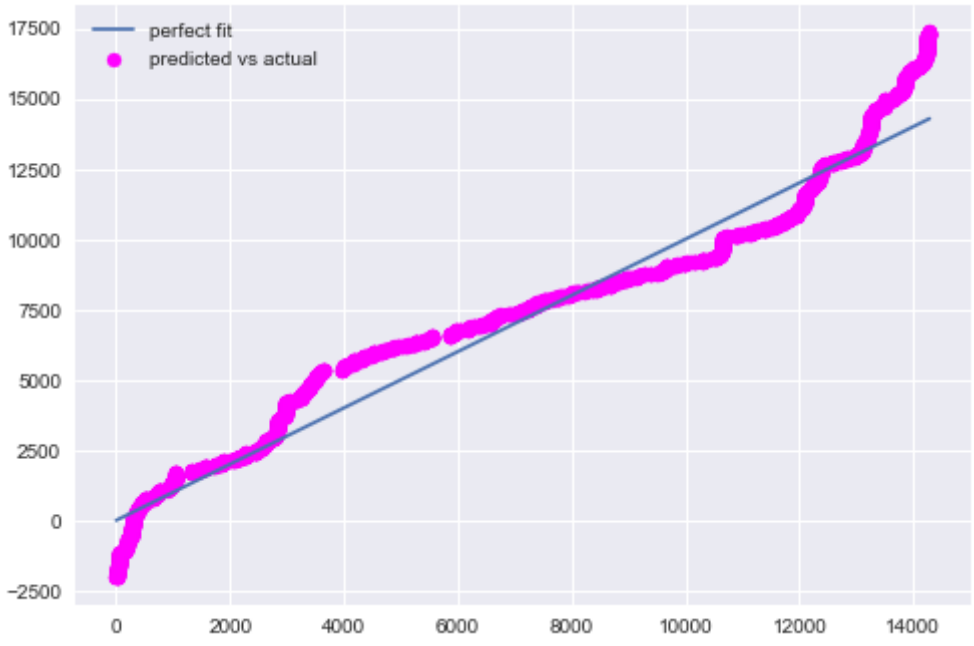

meterid 3723; r2_train: 0.980; r2_val: -1.732; r2_test: -17.282
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000


meterid 3778; r2_train: 0.983; r2_val: -19.120; r2_test: -50.304
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000


meterid 3849; r2_train: 0.965; r2_val: -25.069; r2_test: -213.019
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
17500
15000
12500
10000
7500
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2500
0
−2500
0
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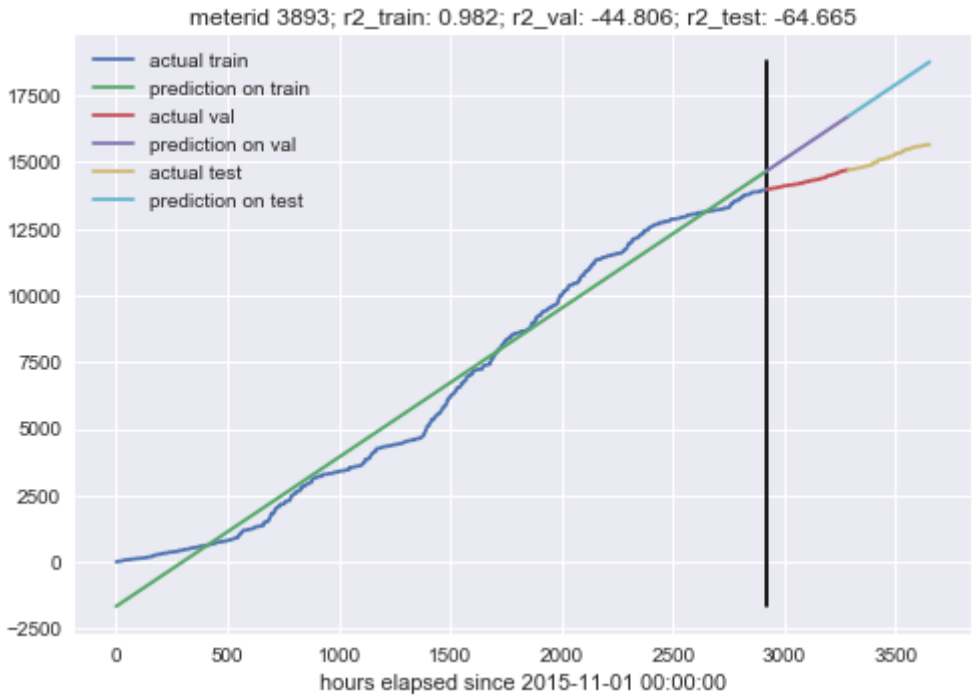
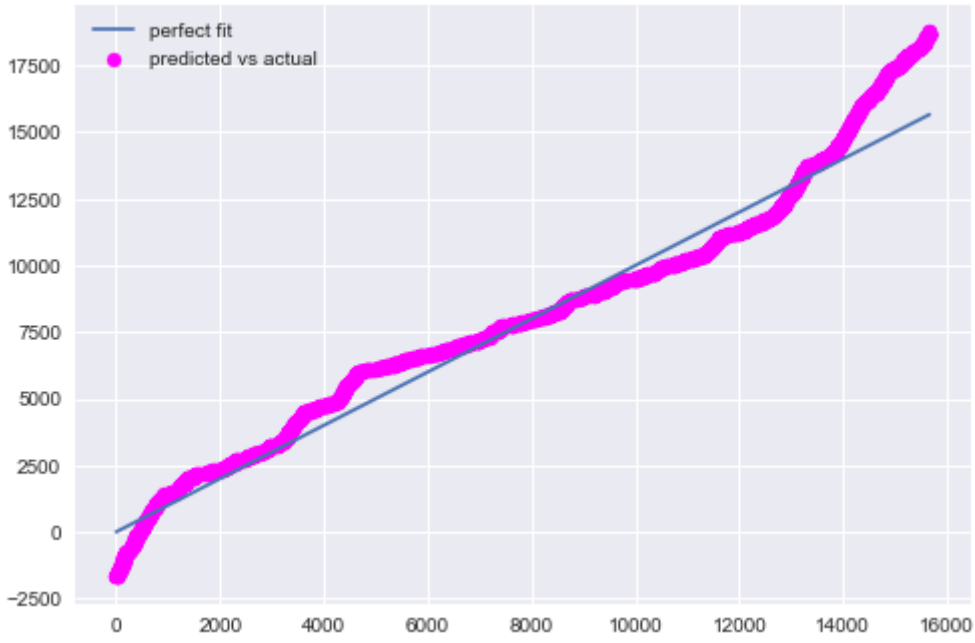
10000
12000
14000


meterid 3893; r2_train: 0.982; r2_val: -44.806; r2_test: -64.665
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
17500
15000
12500
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0
−2500
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4000
6000
8000
10000
12000
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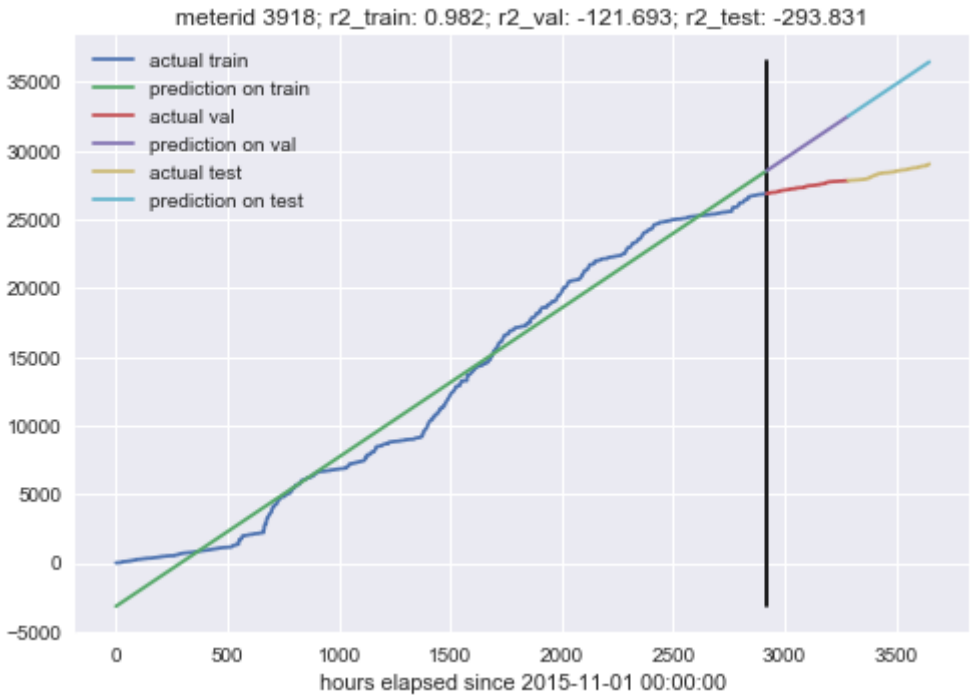
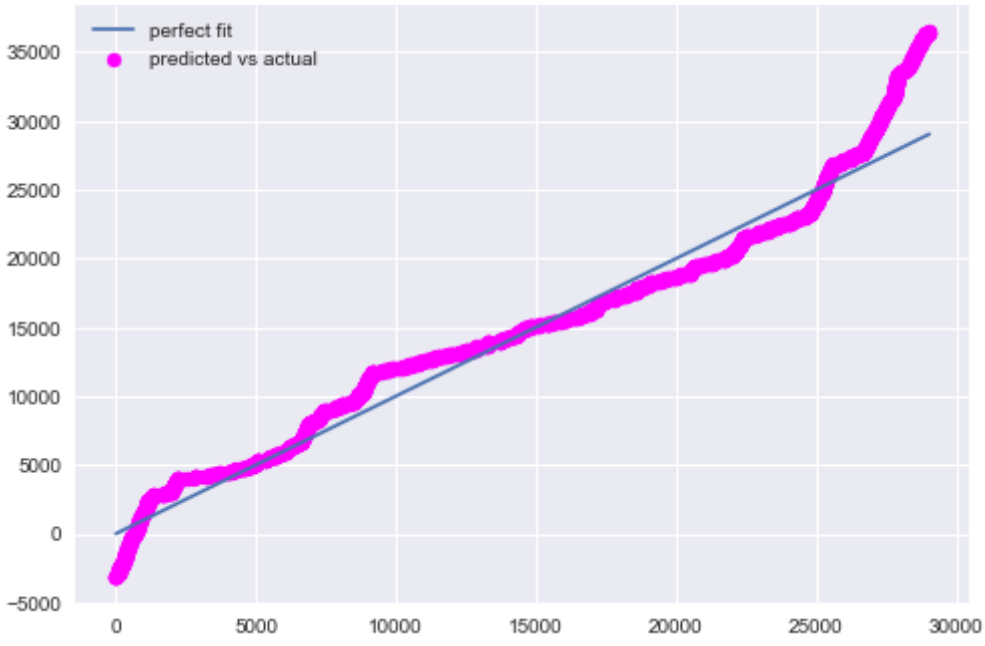
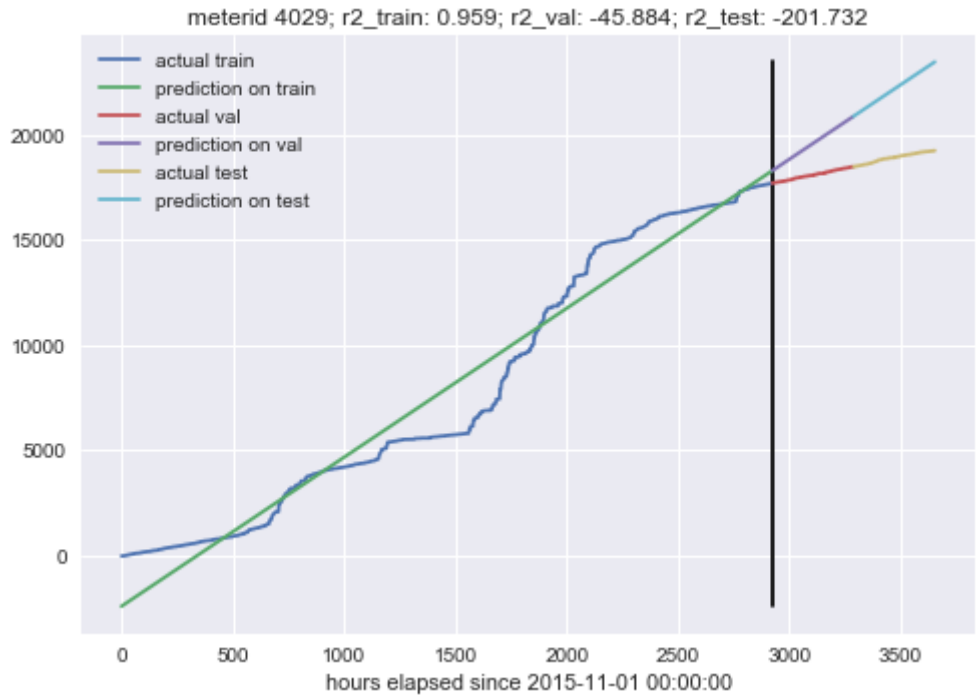
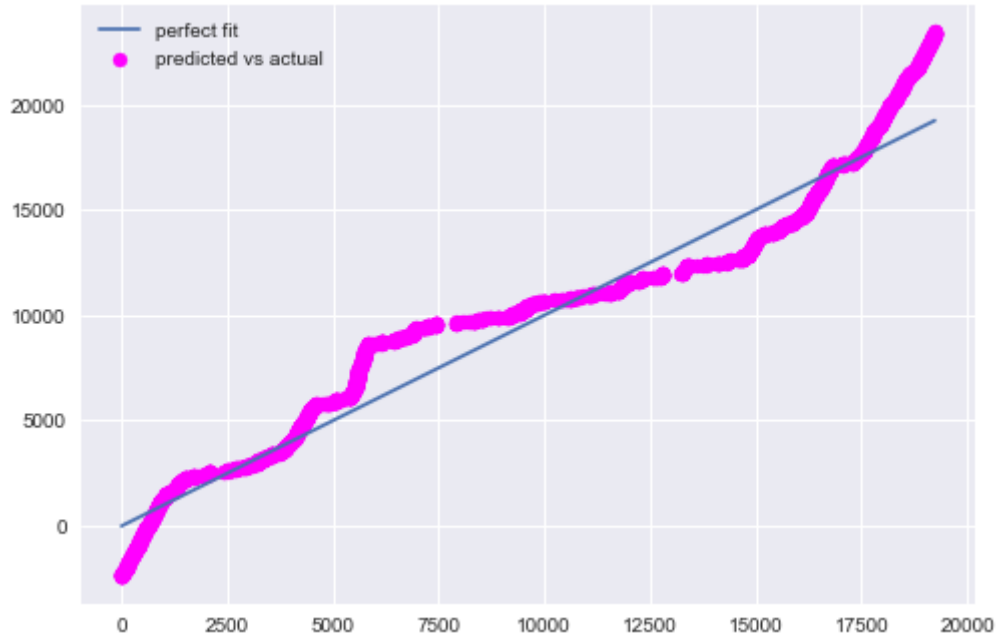
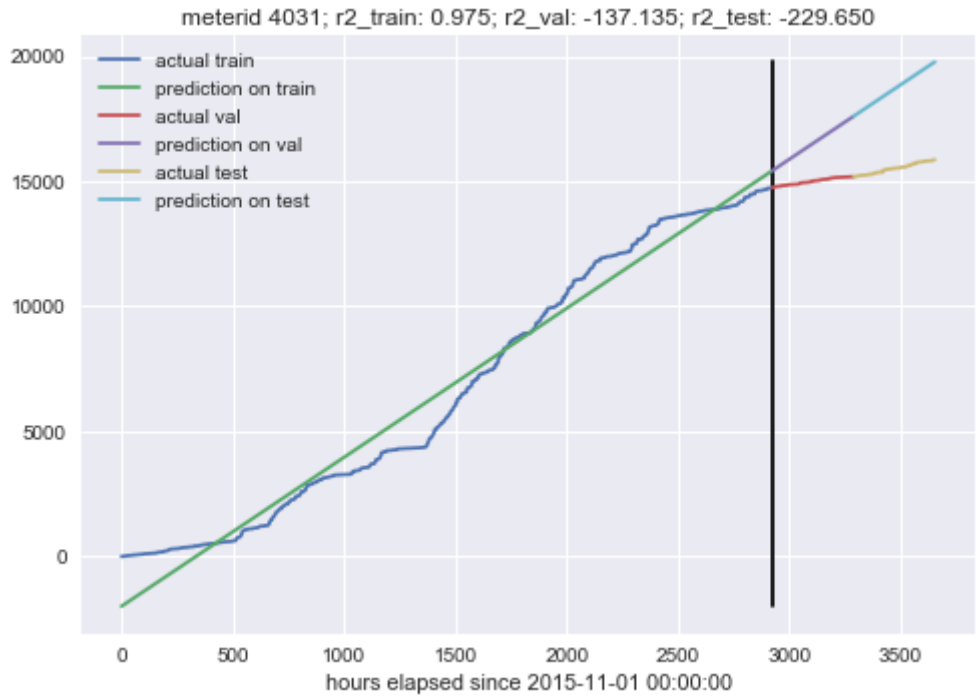
16000

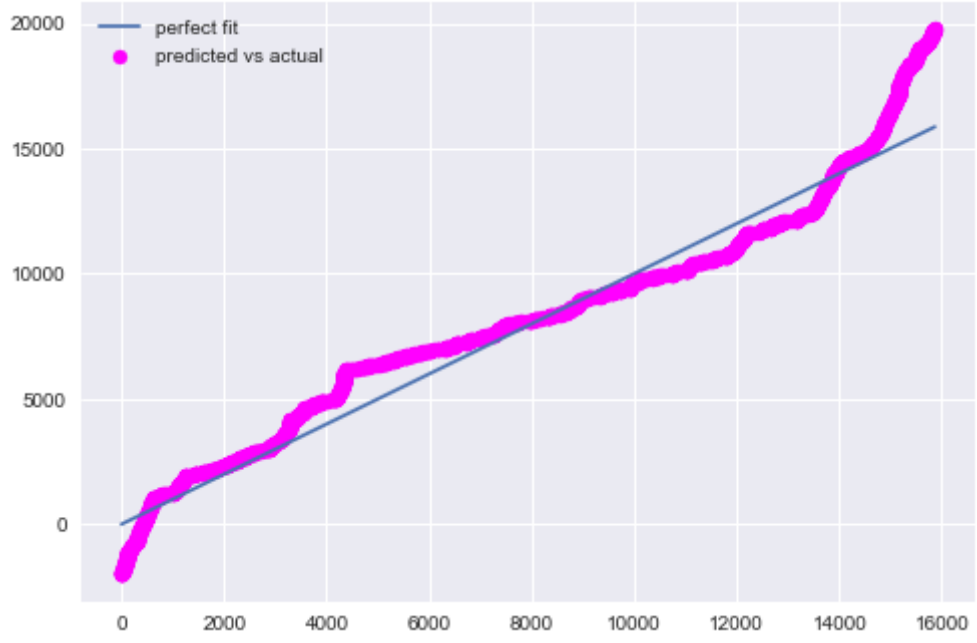

meterid 3918; r2_train: 0.982; r2_val: -121.693; r2_test: -293.831
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

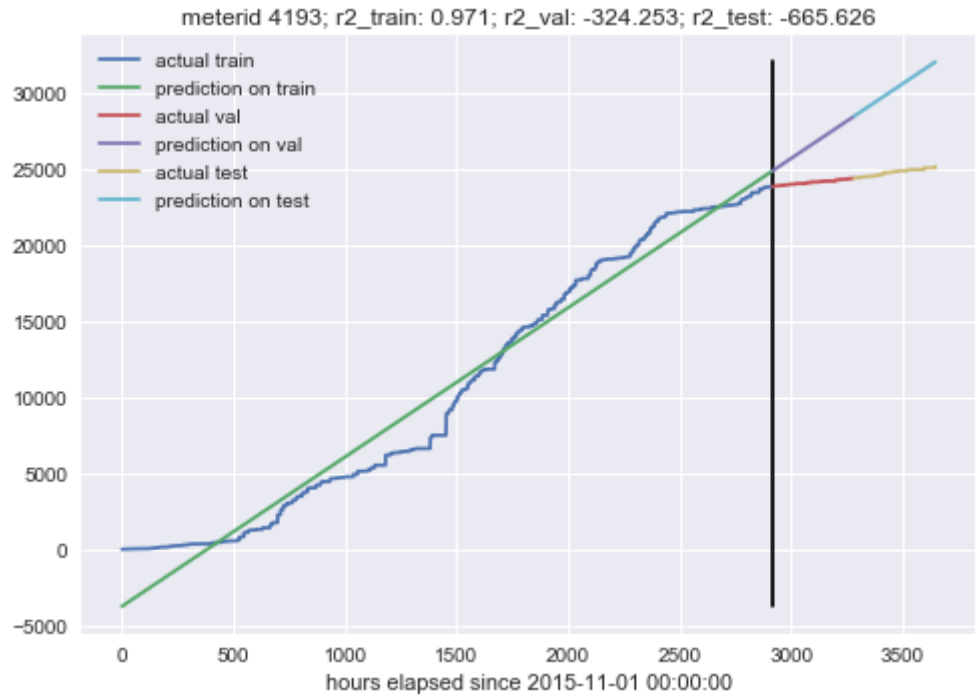

perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000
30000

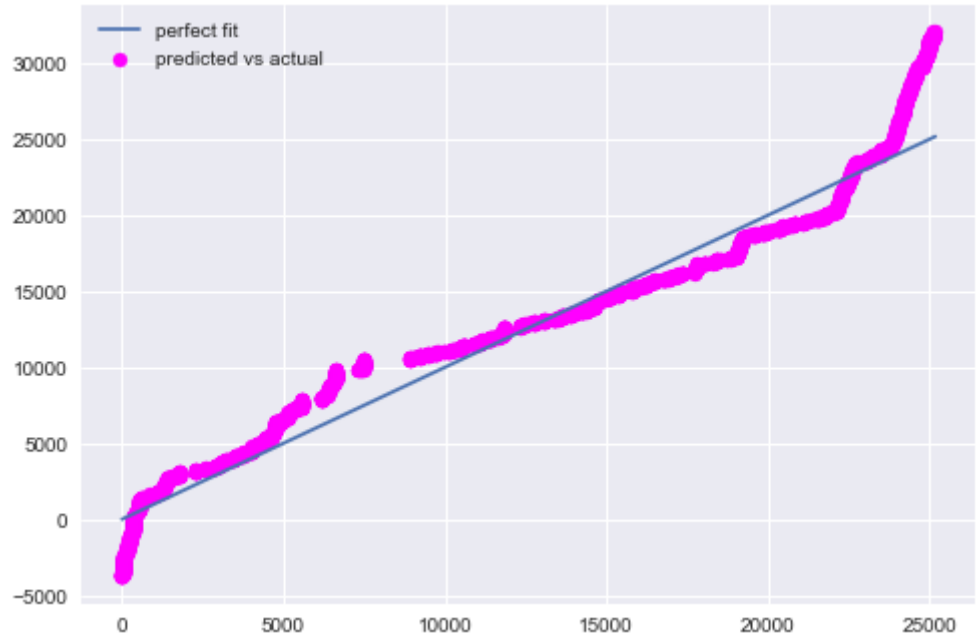

meterid 4029; r2_train: 0.959; r2_val: -45.884; r2_test: -201.732
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
20000


meterid 4031; r2_train: 0.975; r2_val: -137.135; r2_test: -229.650
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000
16000


meterid 4193; r2_train: 0.971; r2_val: -324.253; r2_test: -665.626
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
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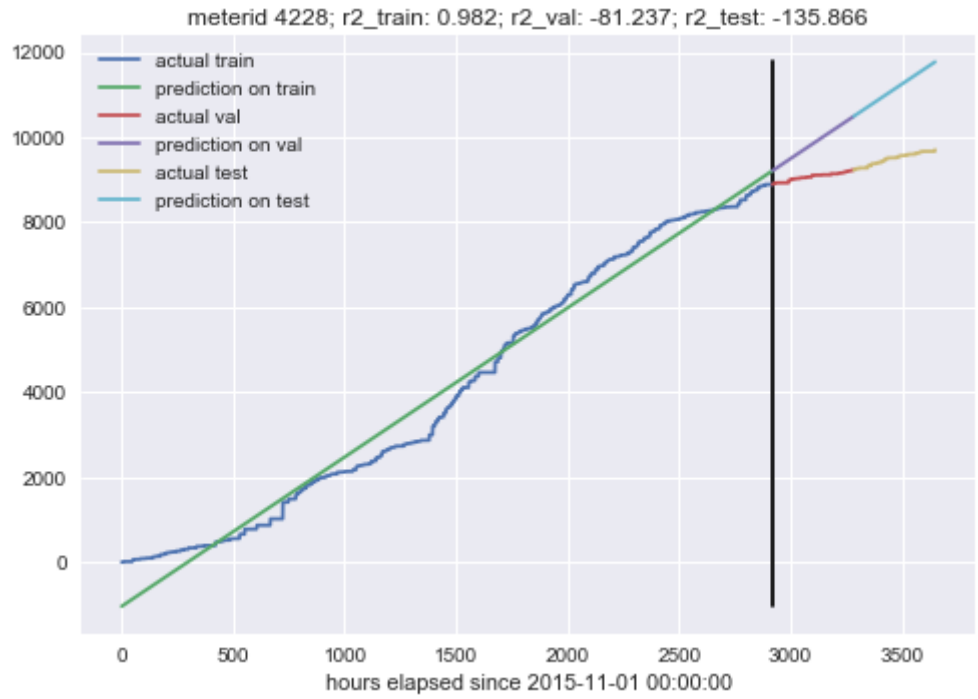
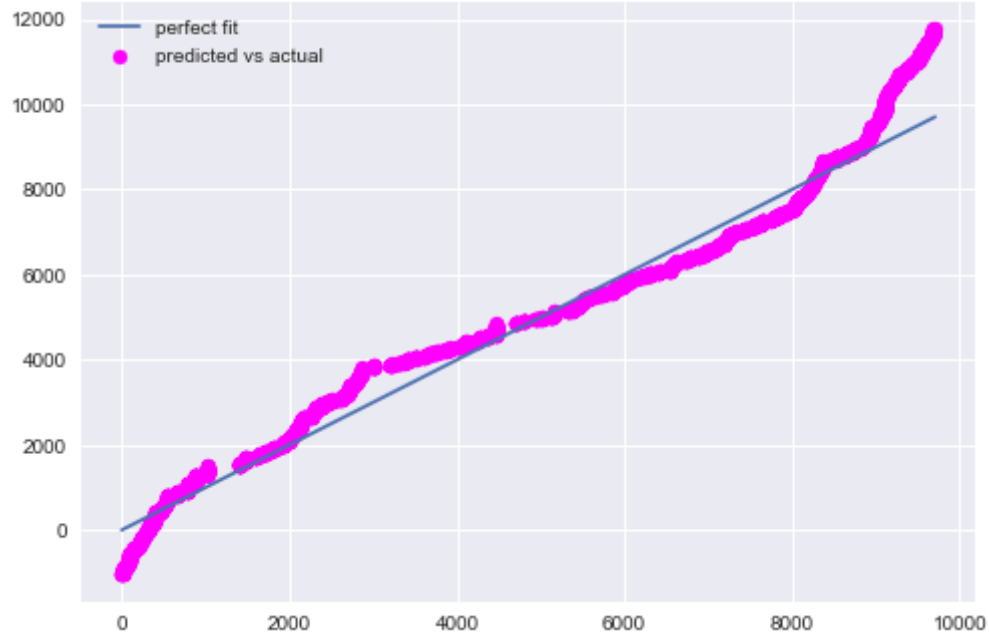
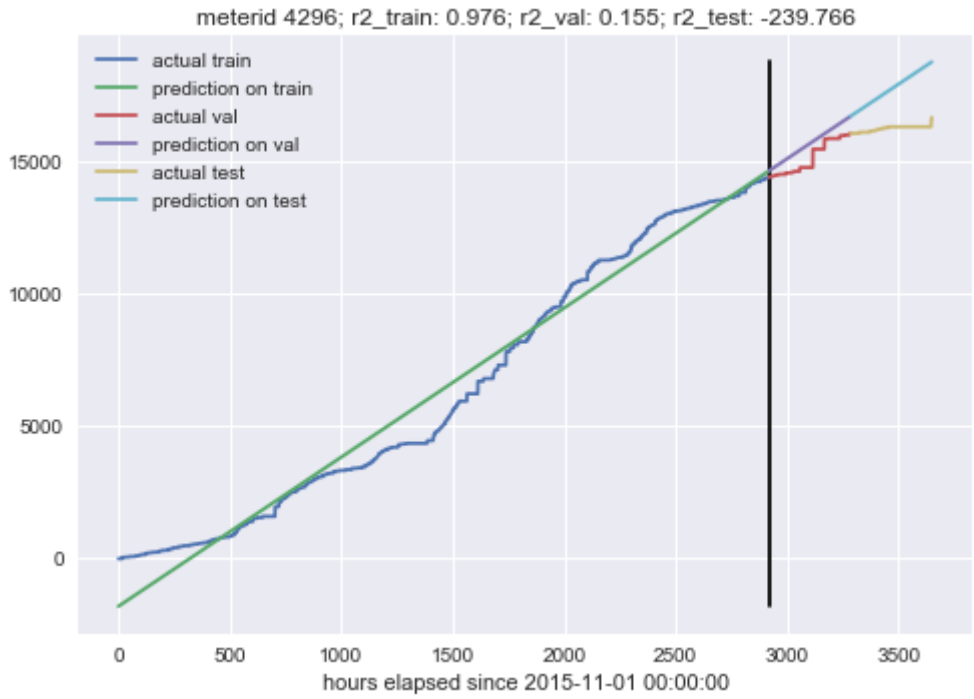
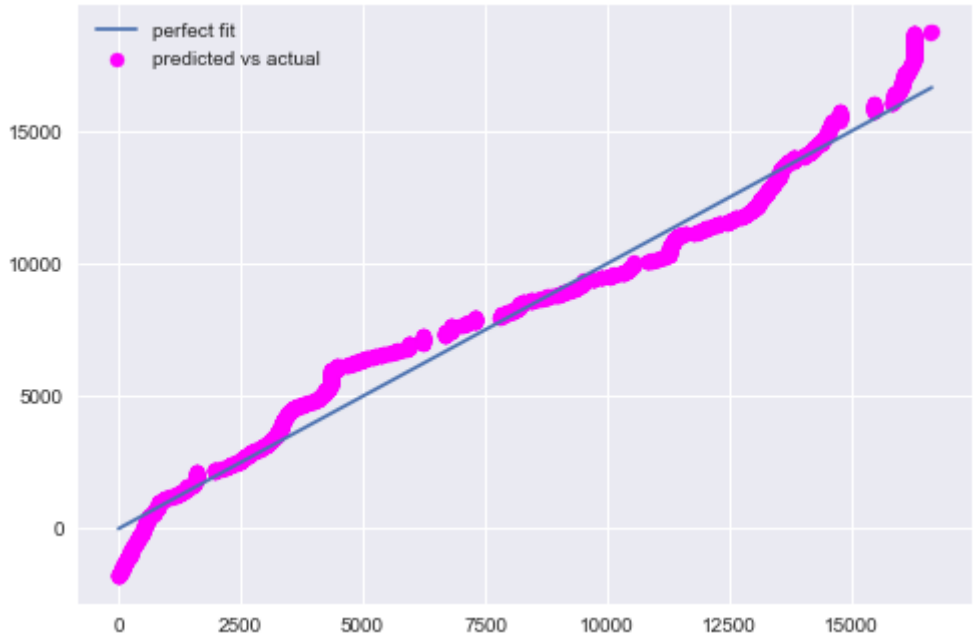
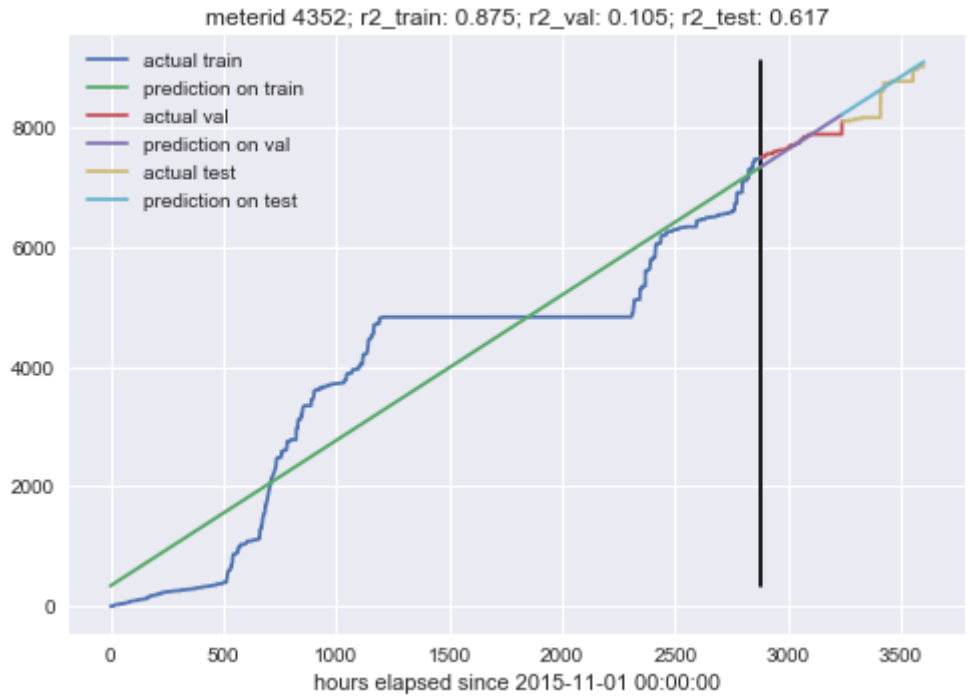
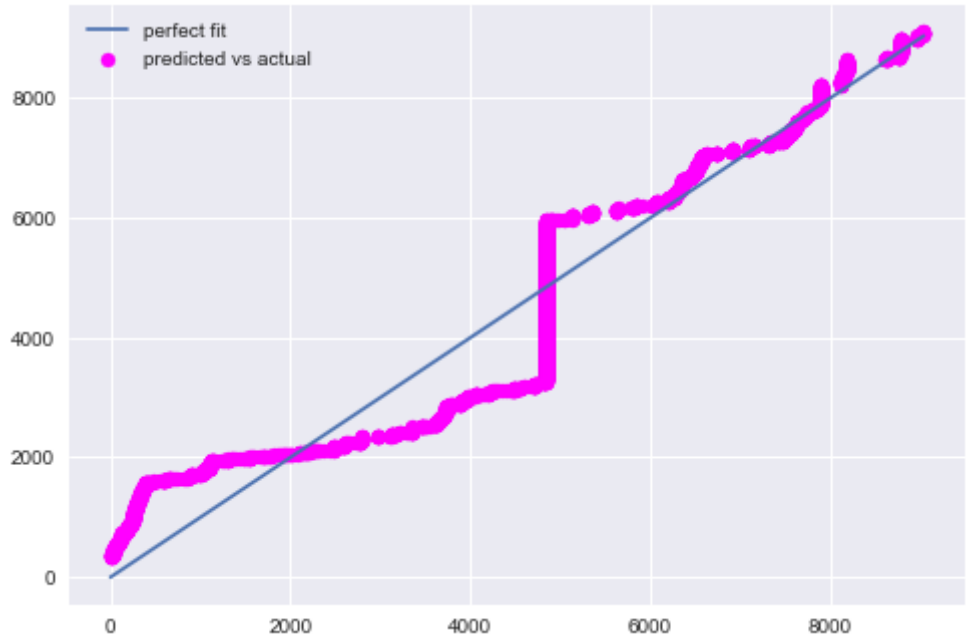

meterid 4228; r2_train: 0.982; r2_val: -81.237; r2_test: -135.866
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

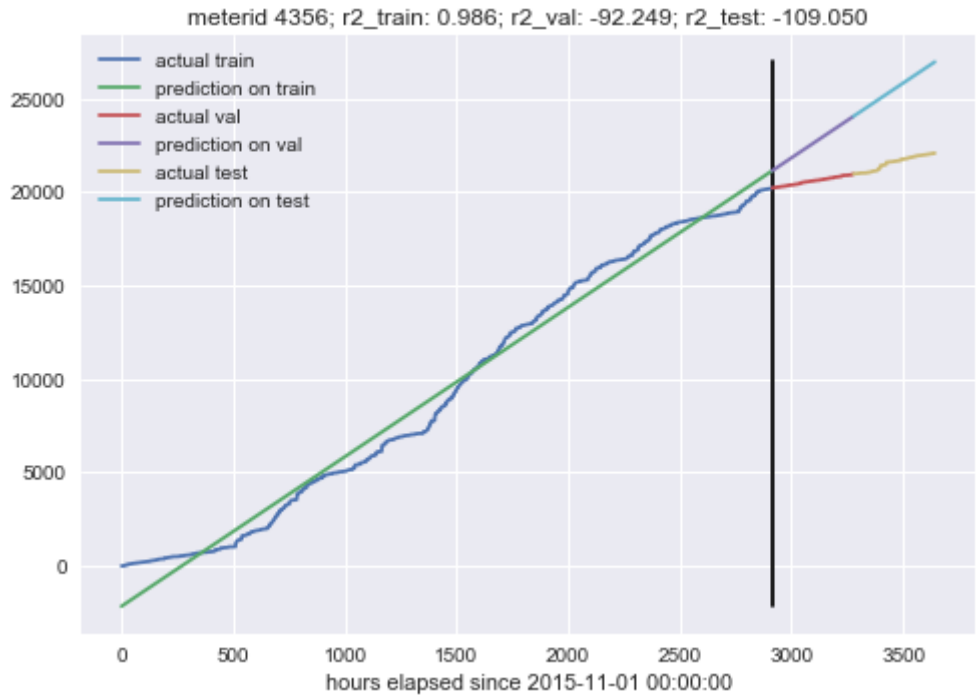

perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000

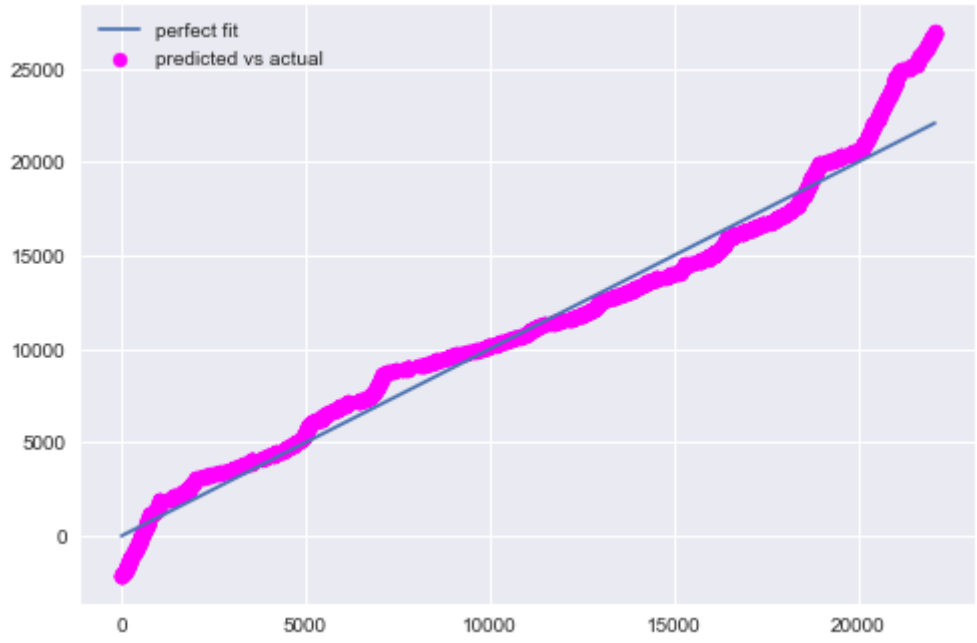

meterid 4296; r2_train: 0.976; r2_val: 0.155; r2_test: -239.766
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

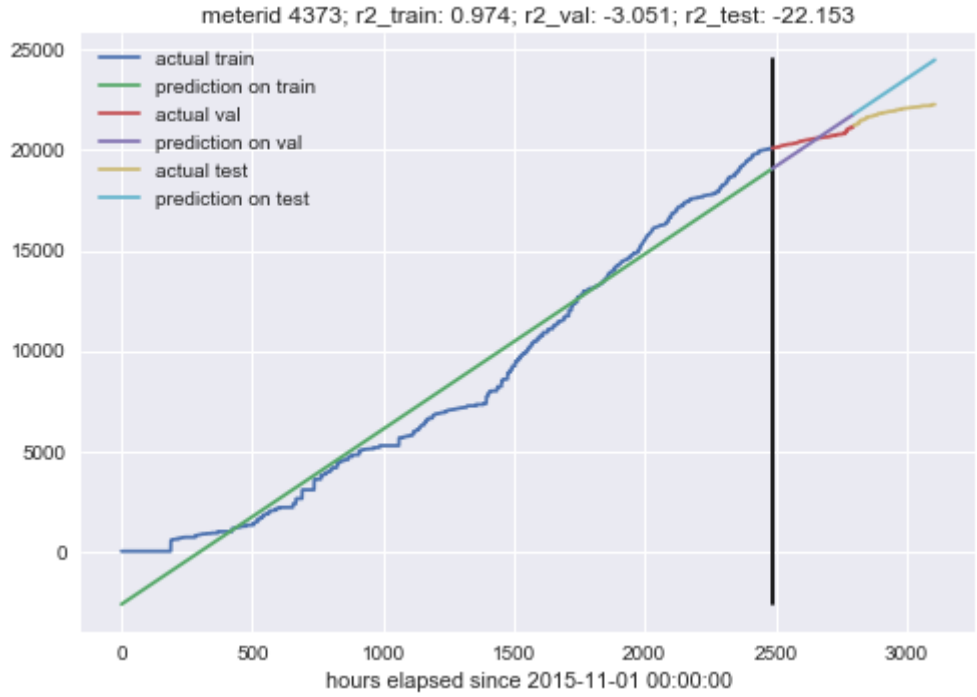

perfect fit
predicted vs actual
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000

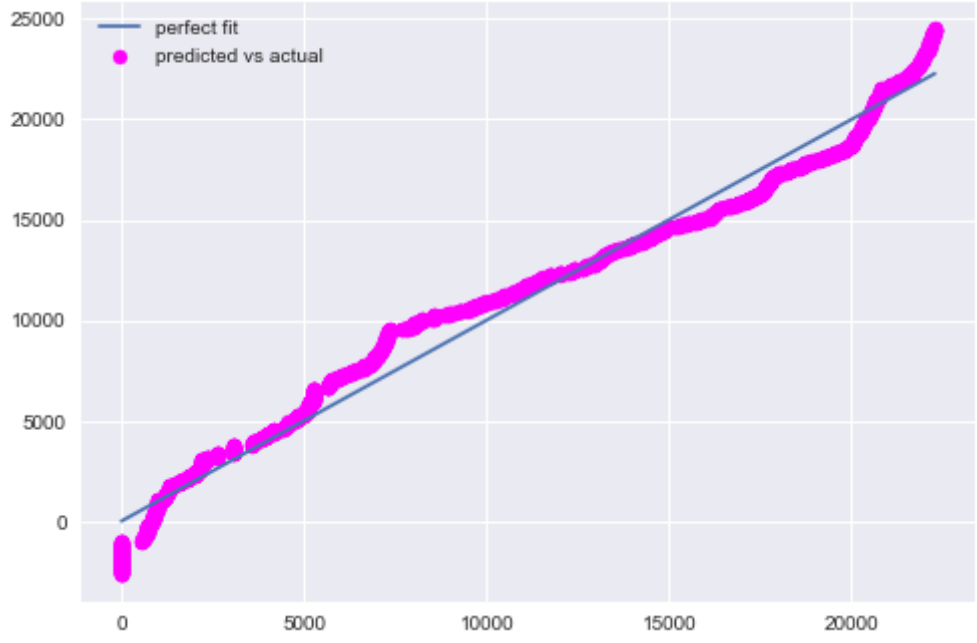

meterid 4352; r2_train: 0.875; r2_val: 0.105; r2_test: 0.617
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

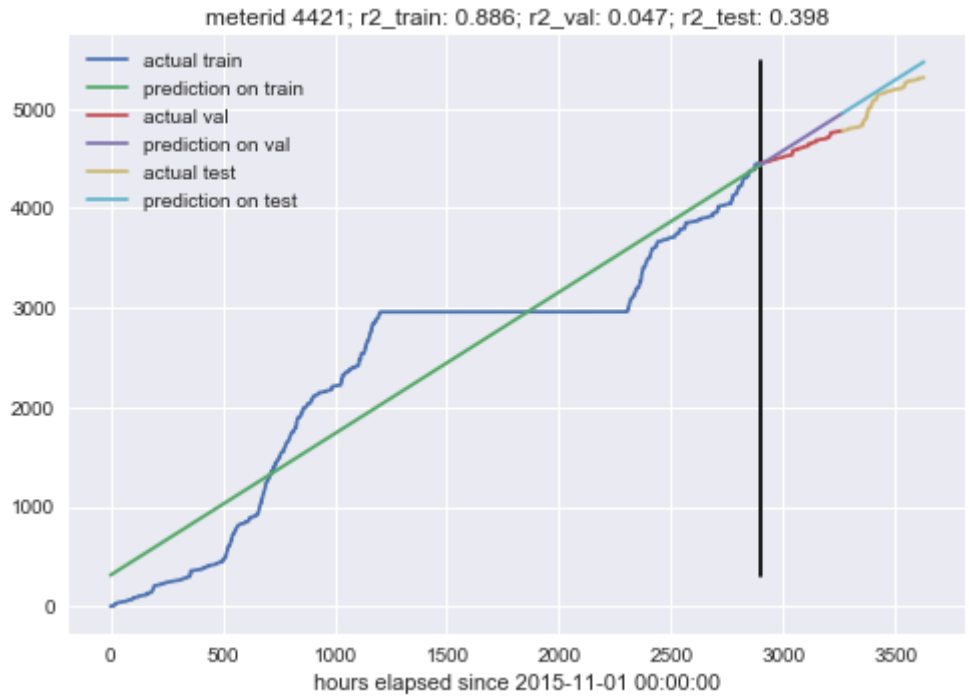

perfect fit
predicted vs actual
8000
6000
4000
2000
0
0
2000
4000
6000
8000

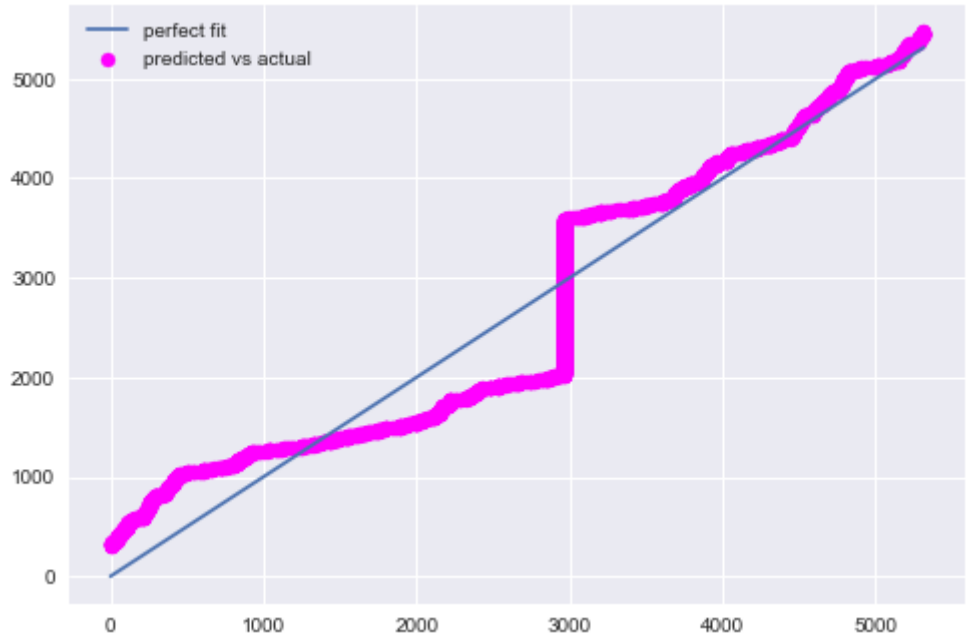

meterid 4356; r2_train: 0.986; r2_val: -92.249; r2_test: -109.050
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

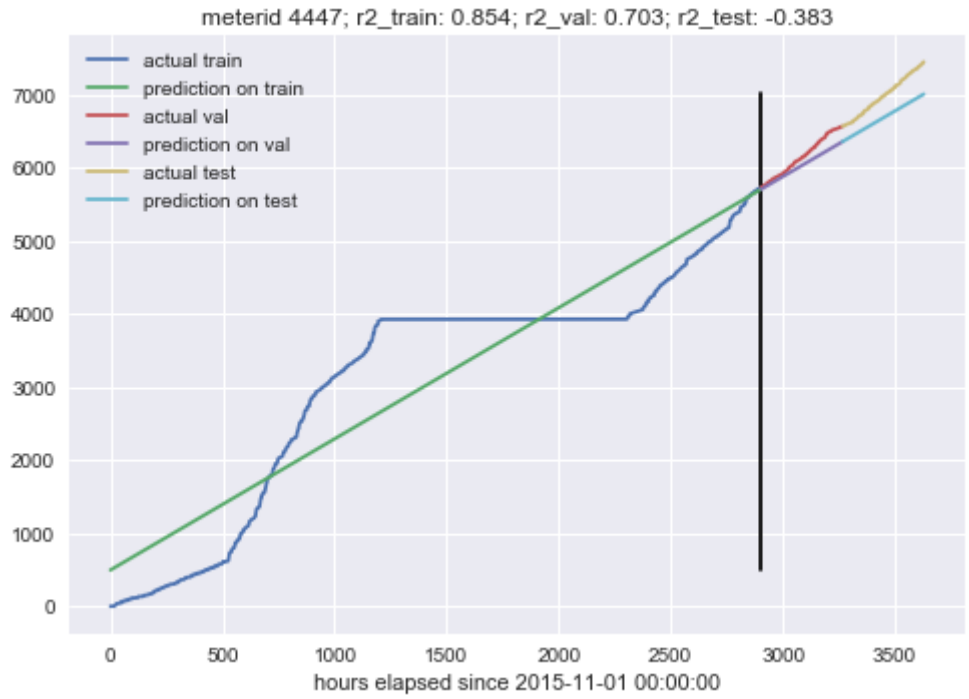

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

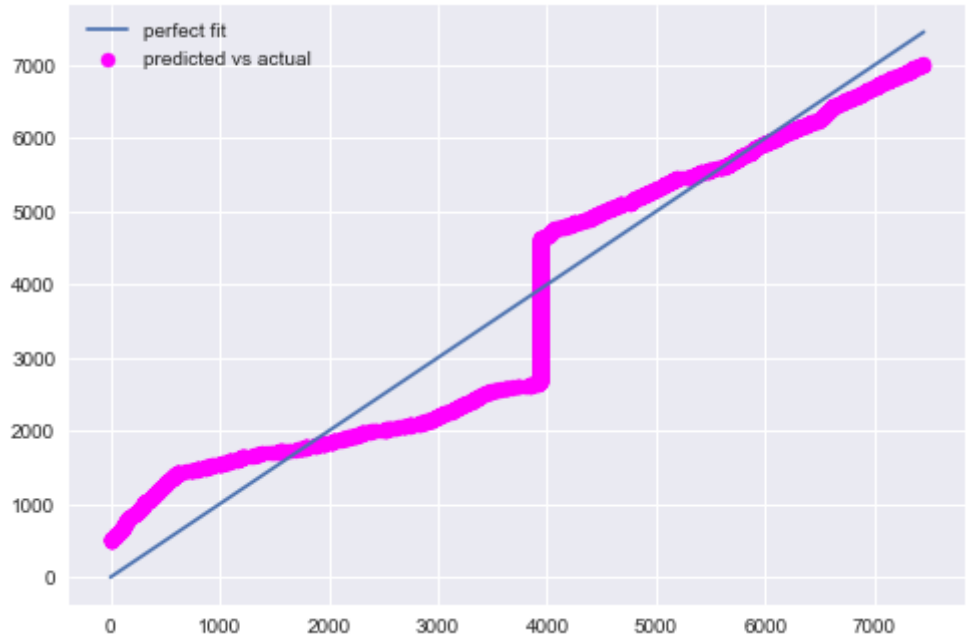

meterid 4373; r2_train: 0.974; r2_val: -3.051; r2_test: -22.153
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

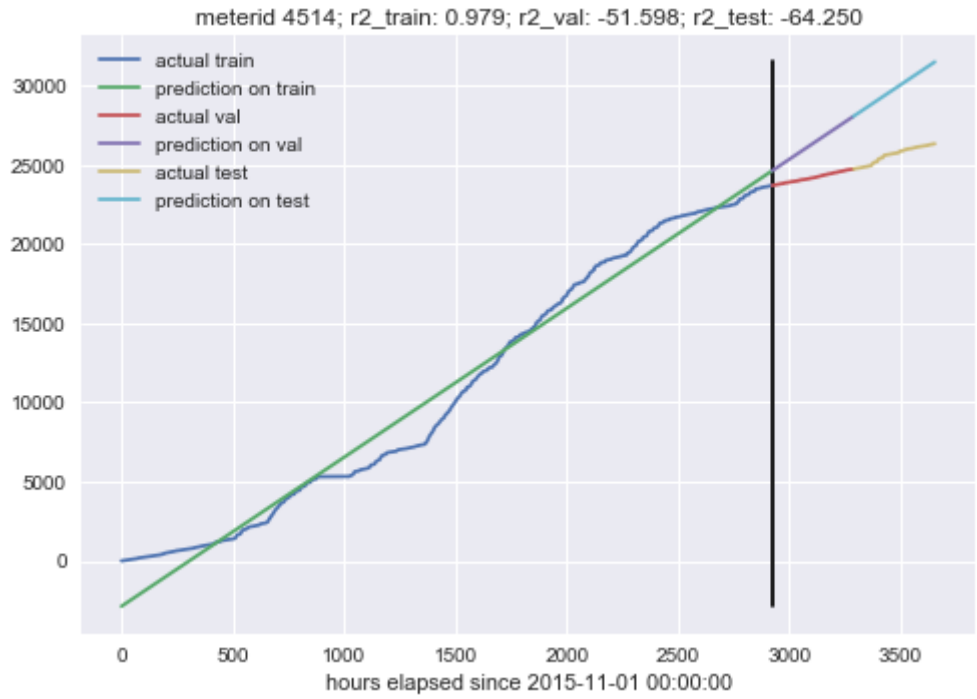

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

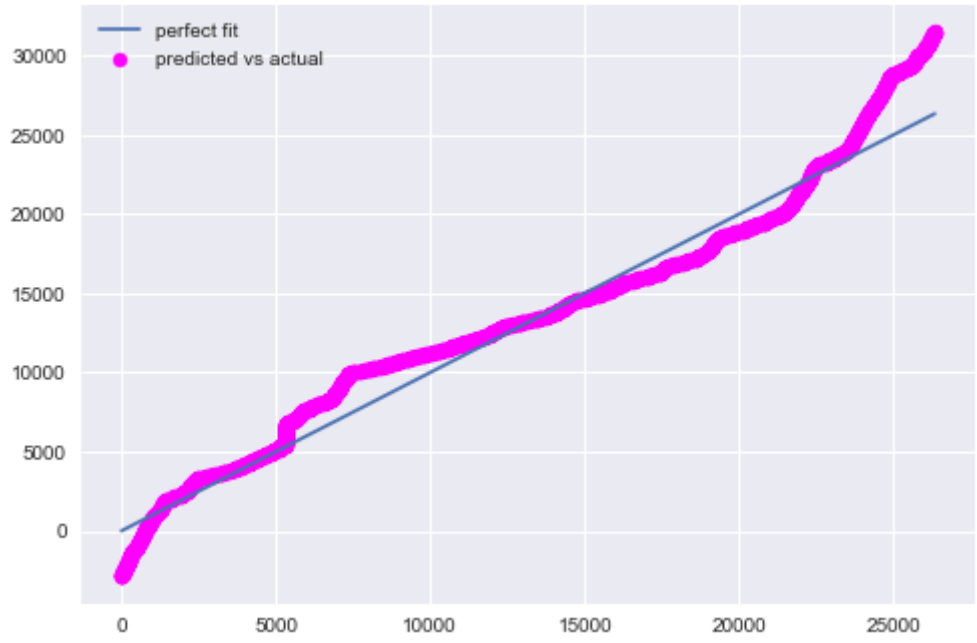

meterid 4421; r2_train: 0.886; r2_val: 0.047; r2_test: 0.398
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
0
1000
2000
3000
4000
5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

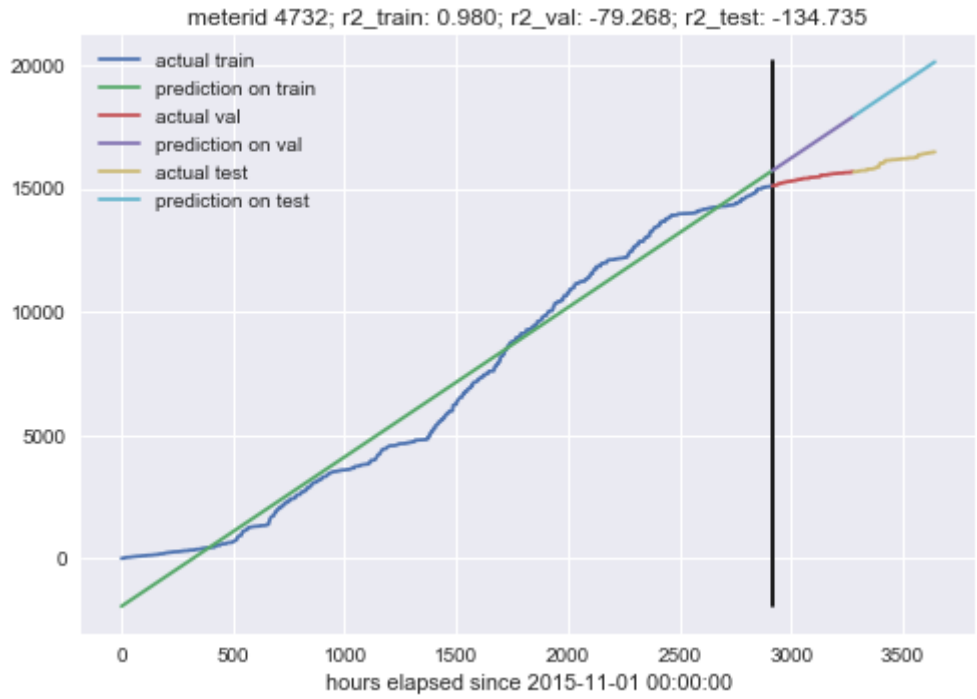

perfect fit
predicted vs actual
0
1000
2000
3000
4000
5000
0
1000
2000
3000
4000
5000

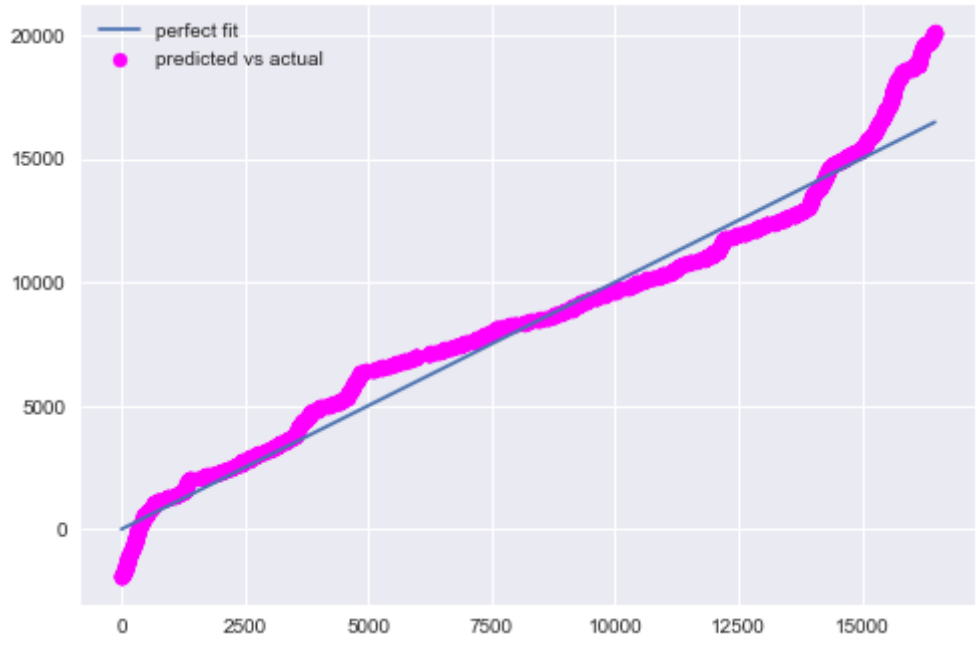

meterid 4447; r2_train: 0.854; r2_val: 0.703; r2_test: -0.383
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
7000
6000
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

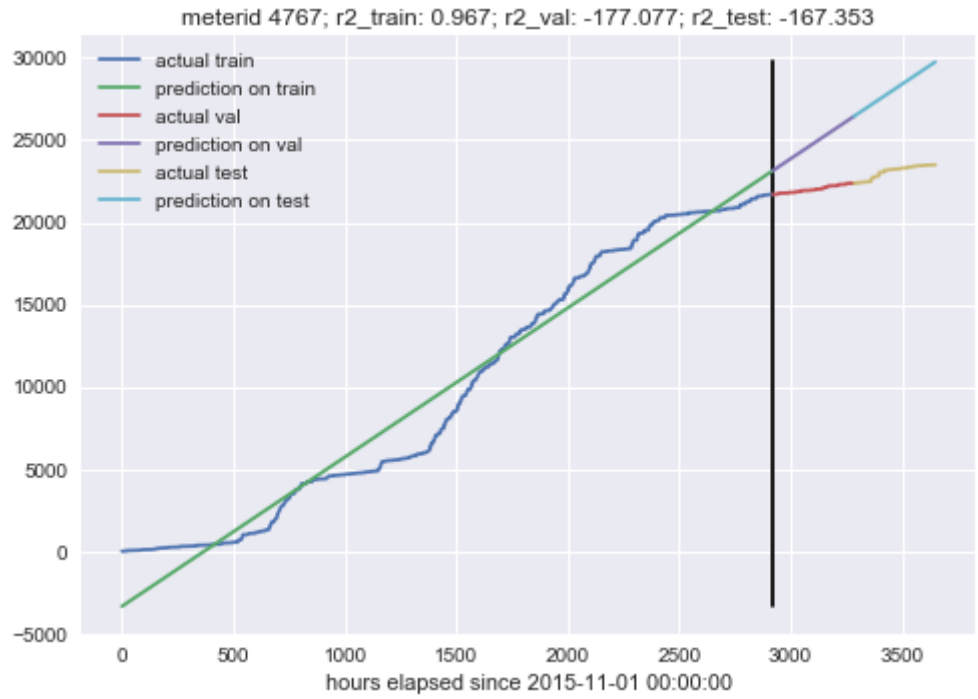

perfect fit
predicted vs actual
7000
6000
5000
4000
3000
2000
1000
0
0
1000
2000
3000
4000
5000
6000
7000

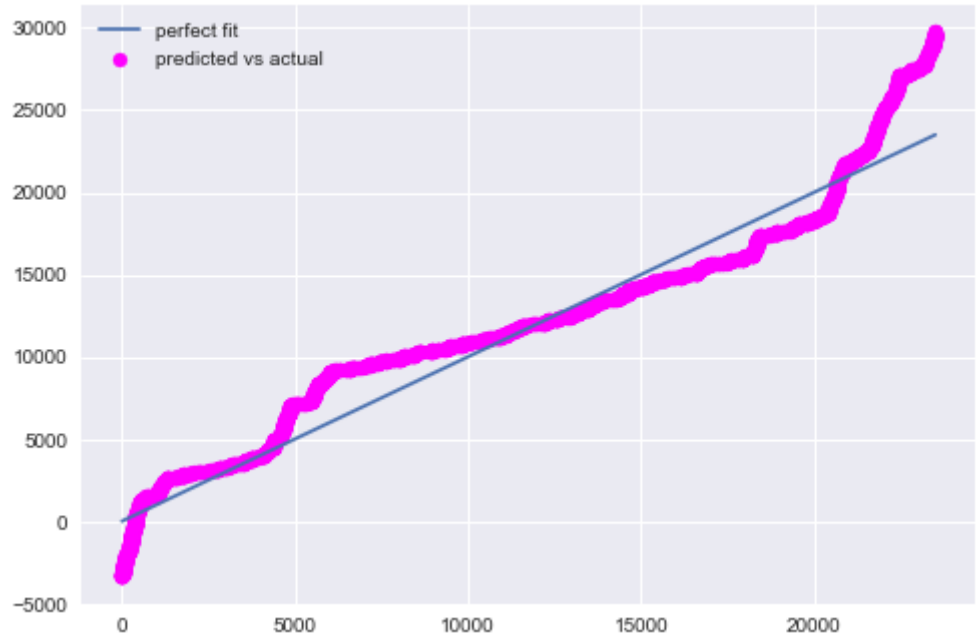

meterid 4514; r2_train: 0.979; r2_val: -51.598; r2_test: -64.250
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

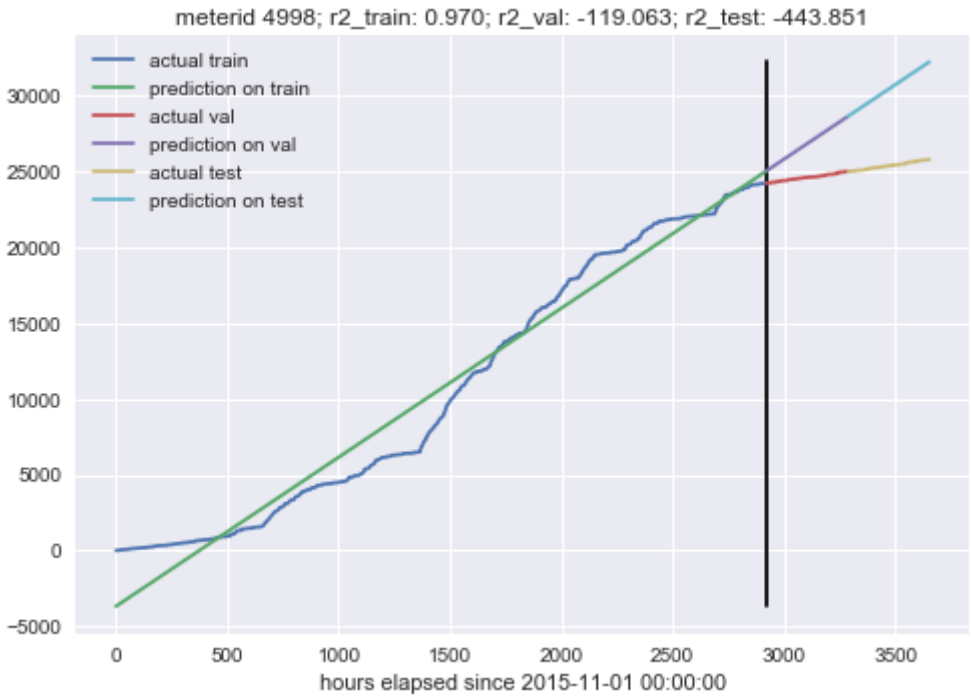

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000

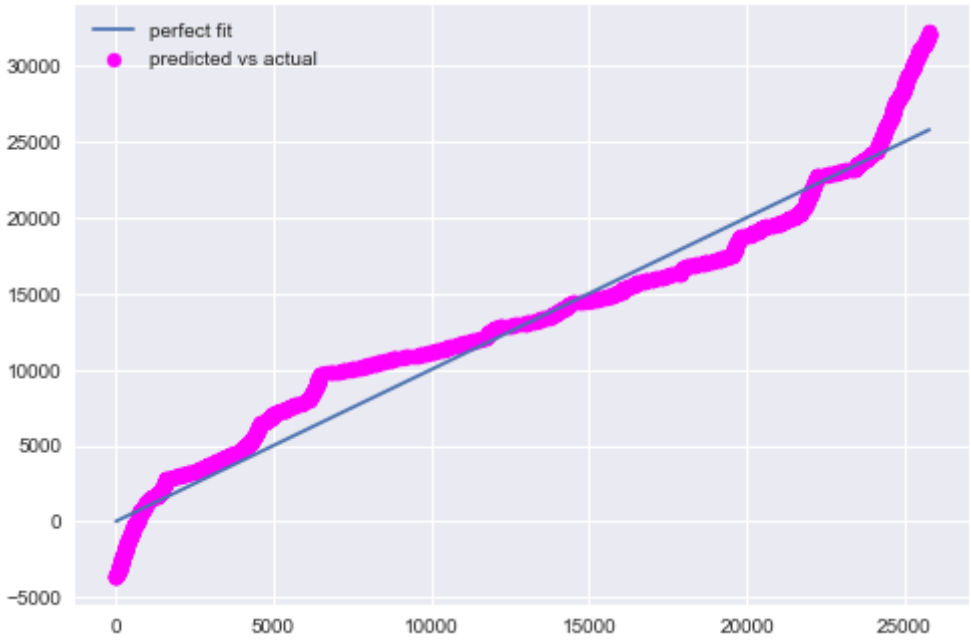

meterid 4732; r2_train: 0.980; r2_val: -79.268; r2_test: -134.735
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

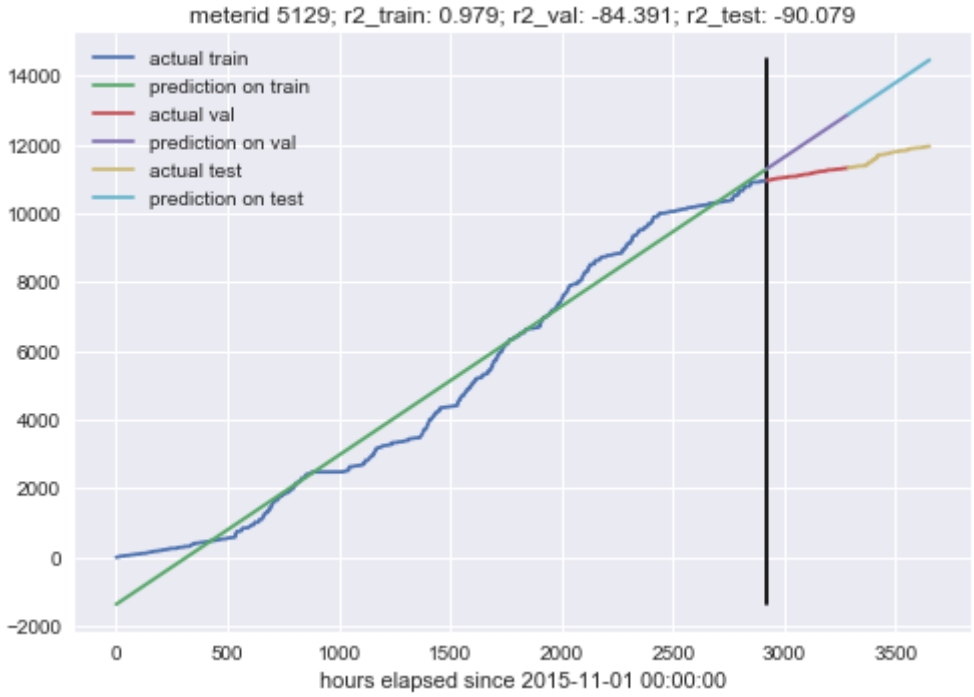

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000

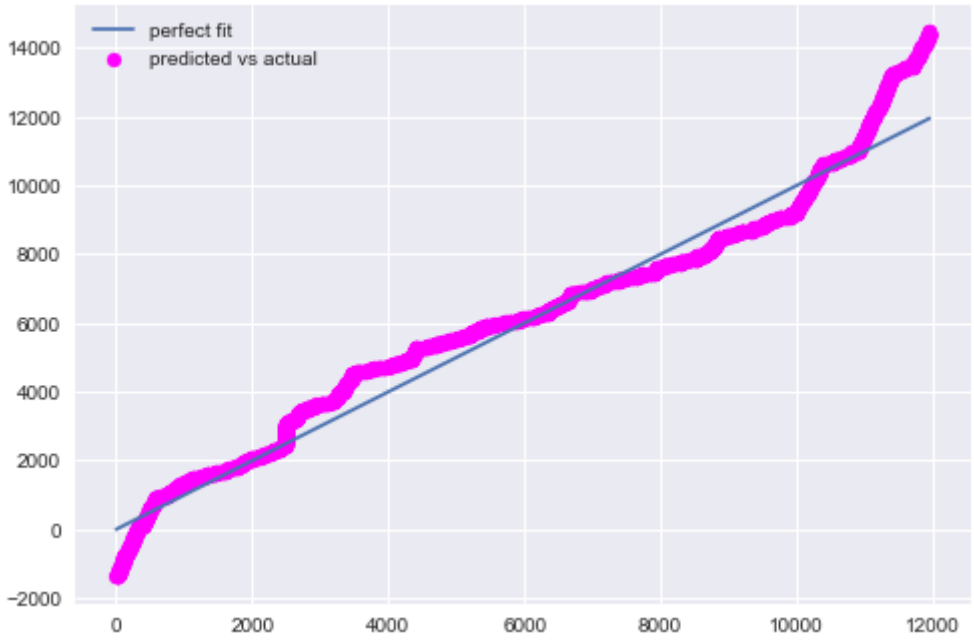

meterid 4767; r2_train: 0.967; r2_val: -177.077; r2_test: -167.353
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

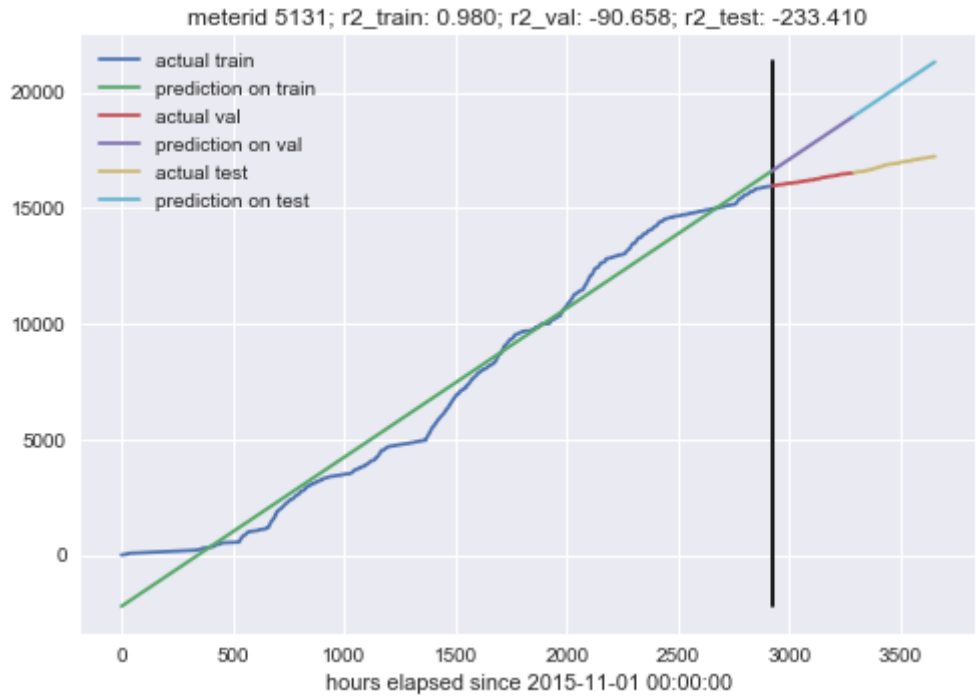

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000

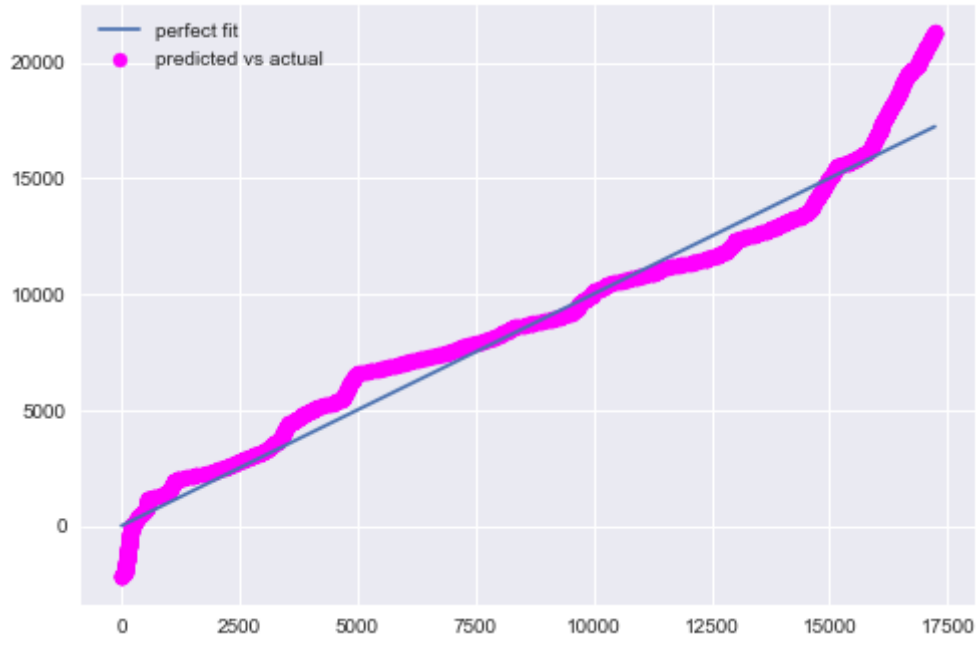

meterid 4998; r2_train: 0.970; r2_val: -119.063; r2_test: -443.851
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

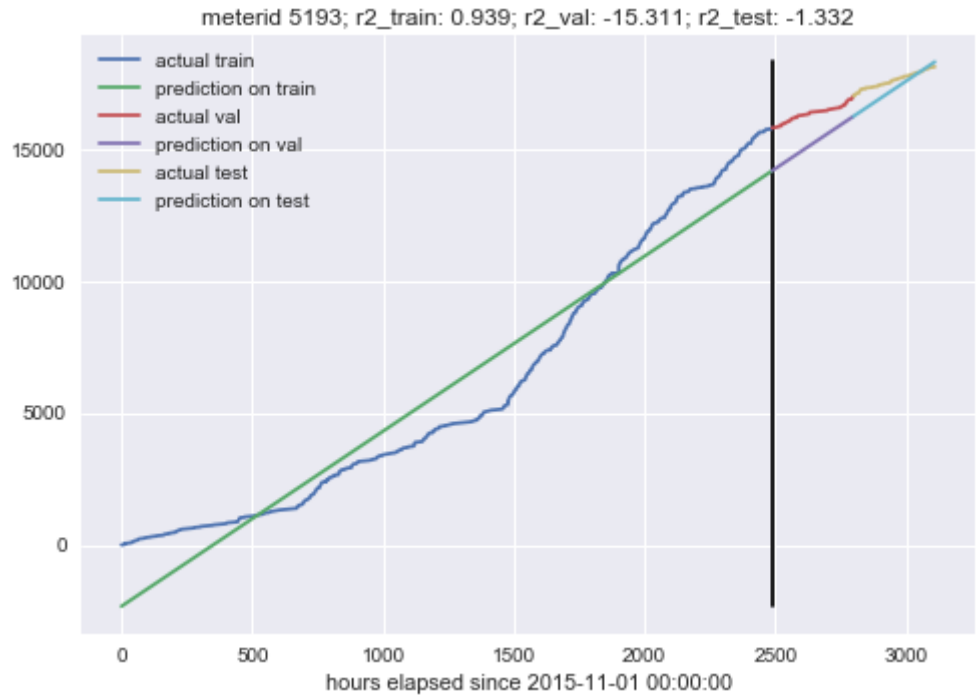

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000

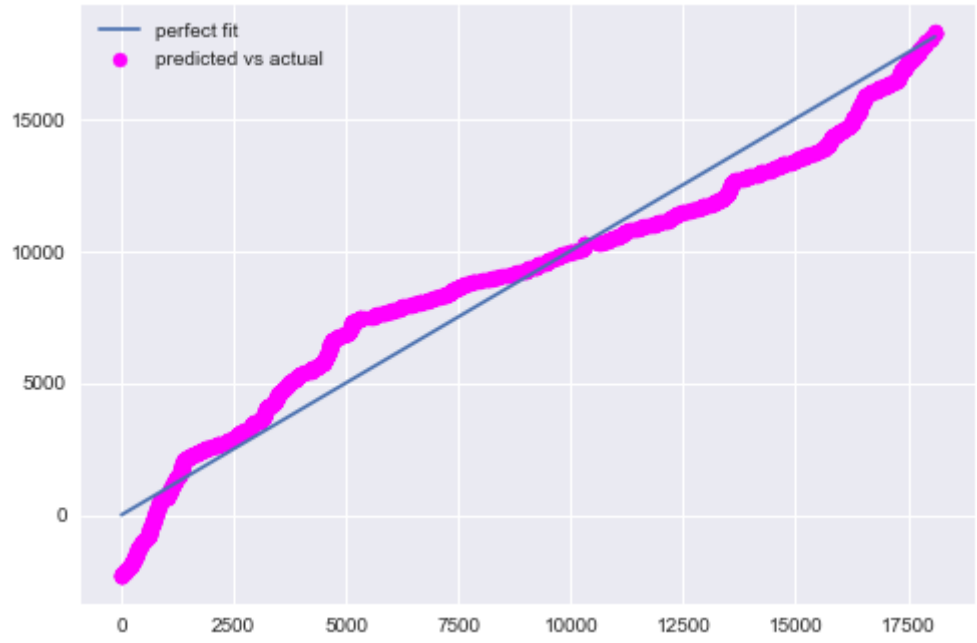

meterid 5129; r2_train: 0.979; r2_val: -84.391; r2_test: -90.079
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

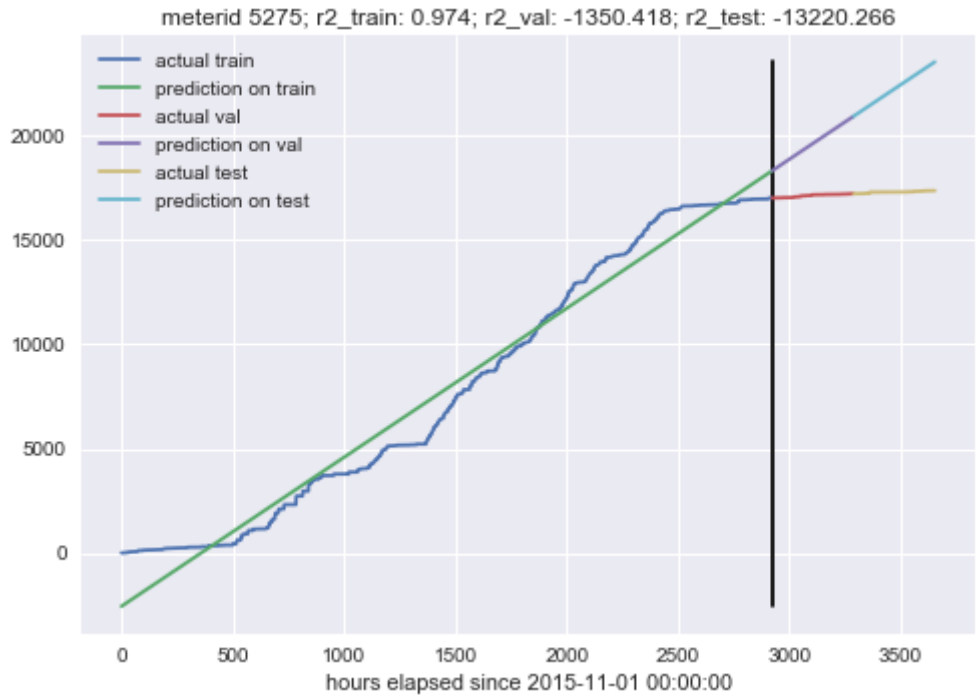

perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000
12000

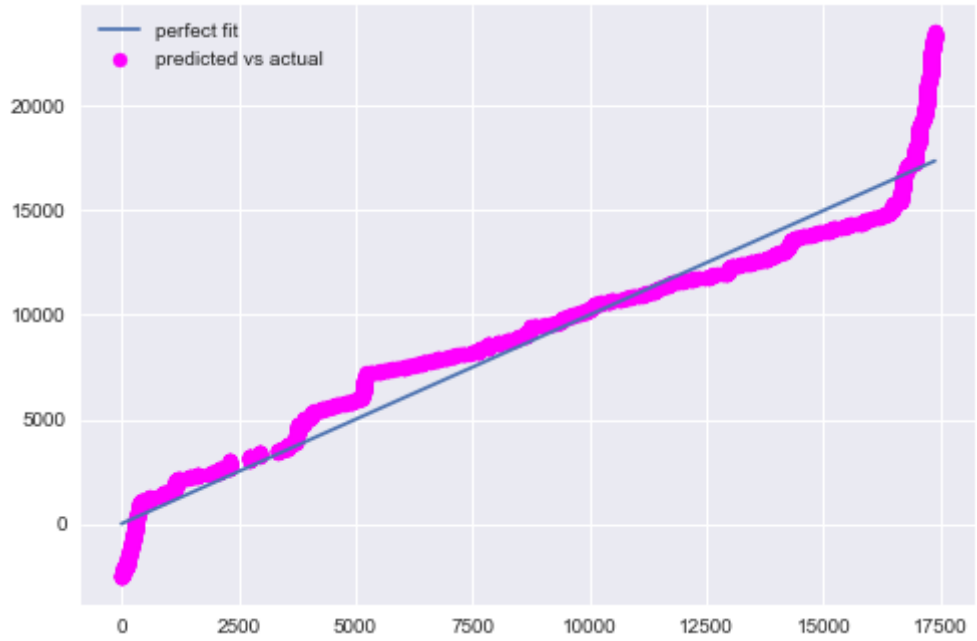

meterid 5131; r2_train: 0.980; r2_val: -90.658; r2_test: -233.410
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

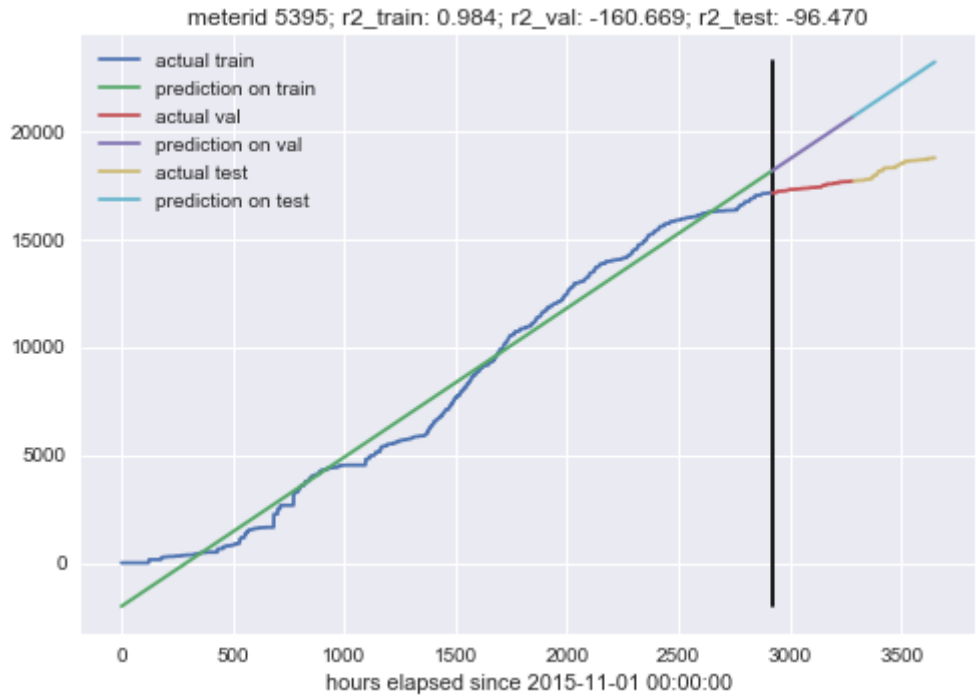

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

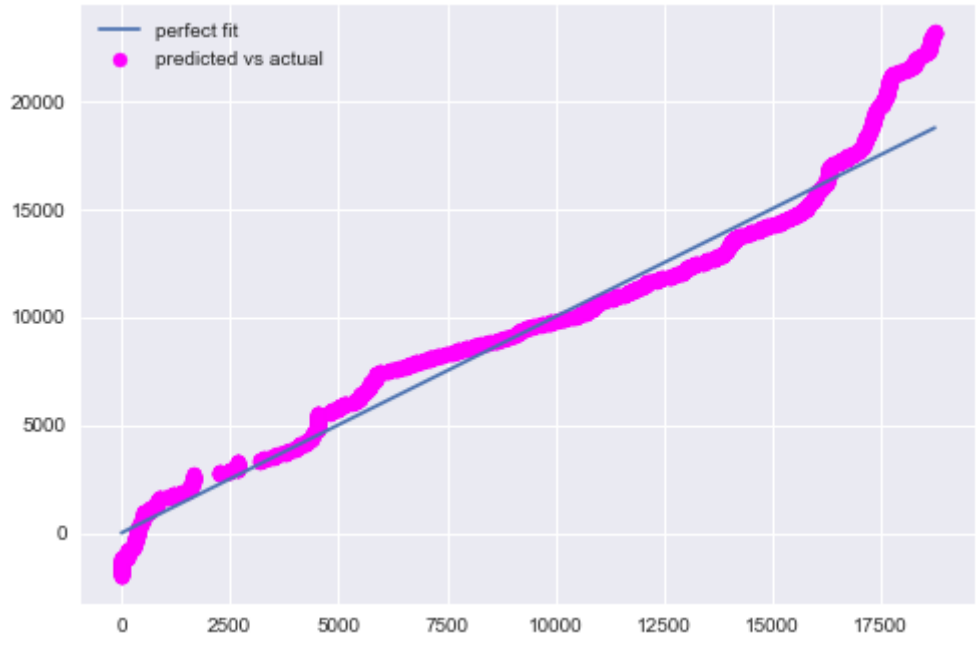

meterid 5193; r2_train: 0.939; r2_val: -15.311; r2_test: -1.332
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

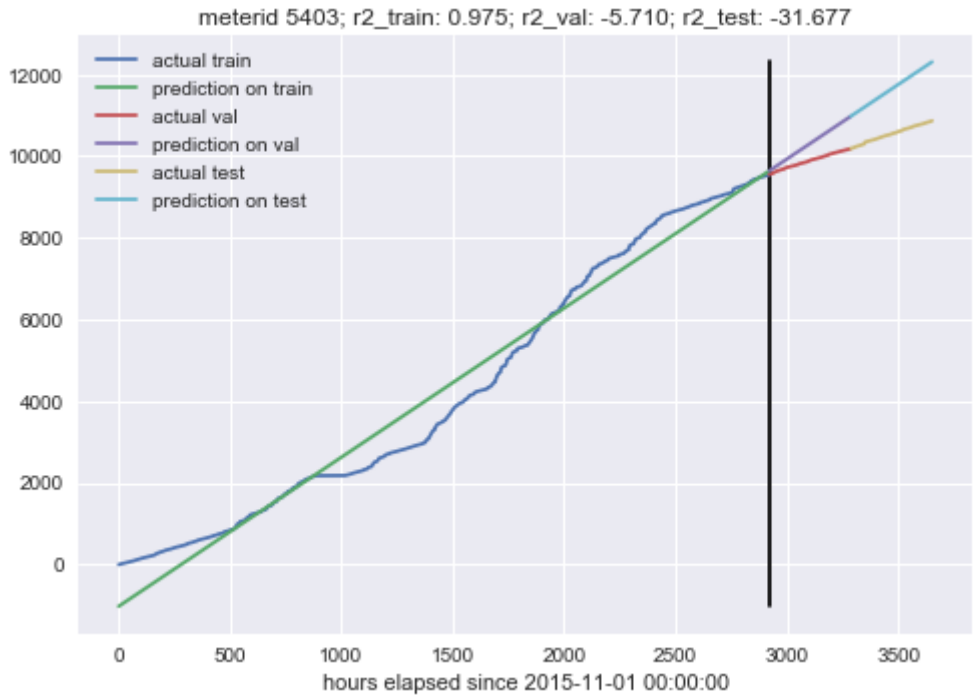

perfect fit
predicted vs actual
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

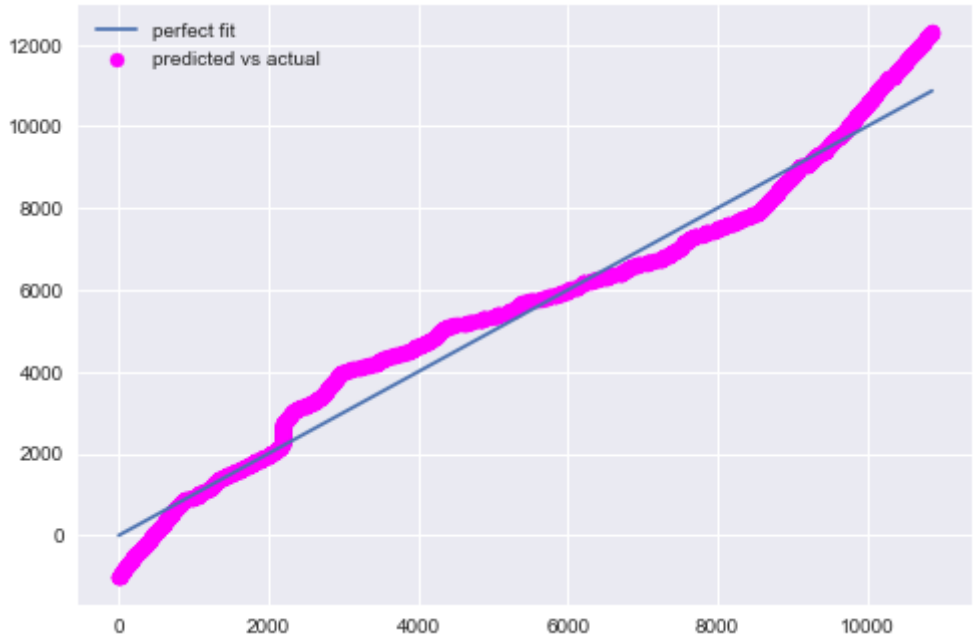

meterid 5275; r2_train: 0.974; r2_val: -1350.418; r2_test: -13220.266
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

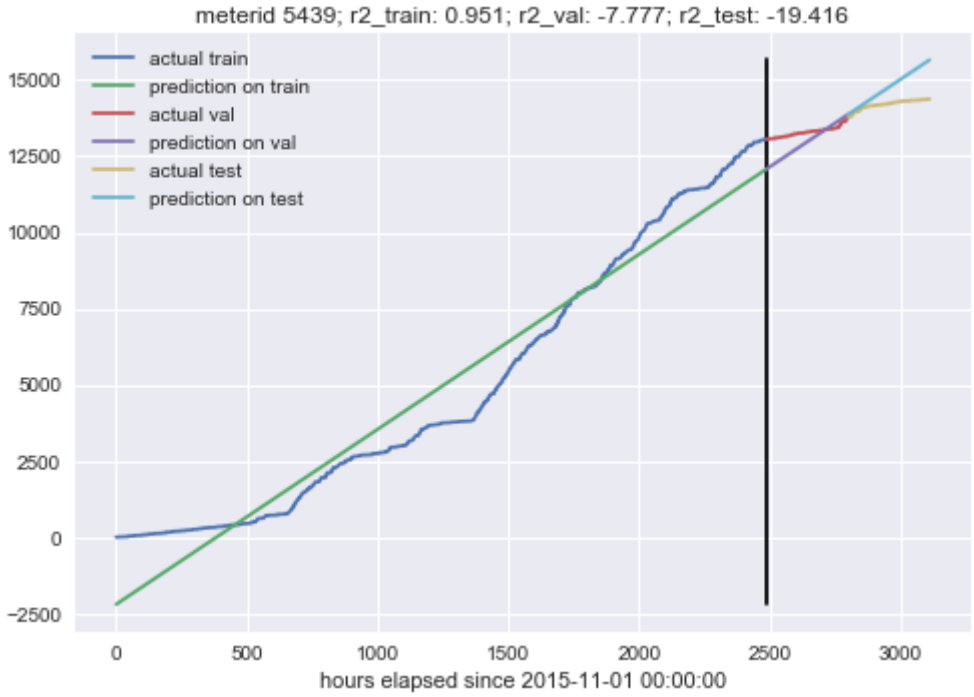

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

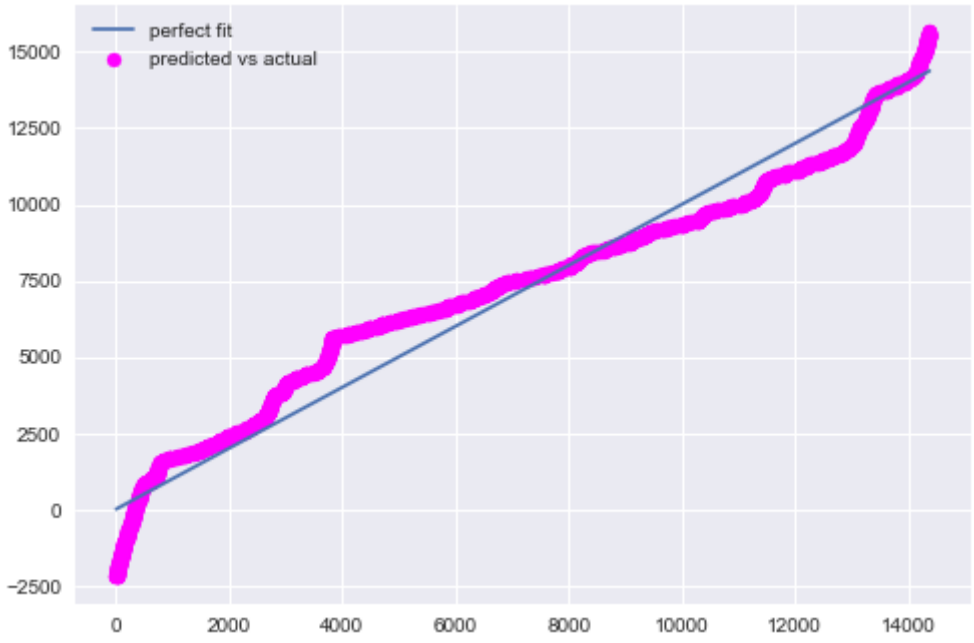

meterid 5395; r2_train: 0.984; r2_val: -160.669; r2_test: -96.470
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

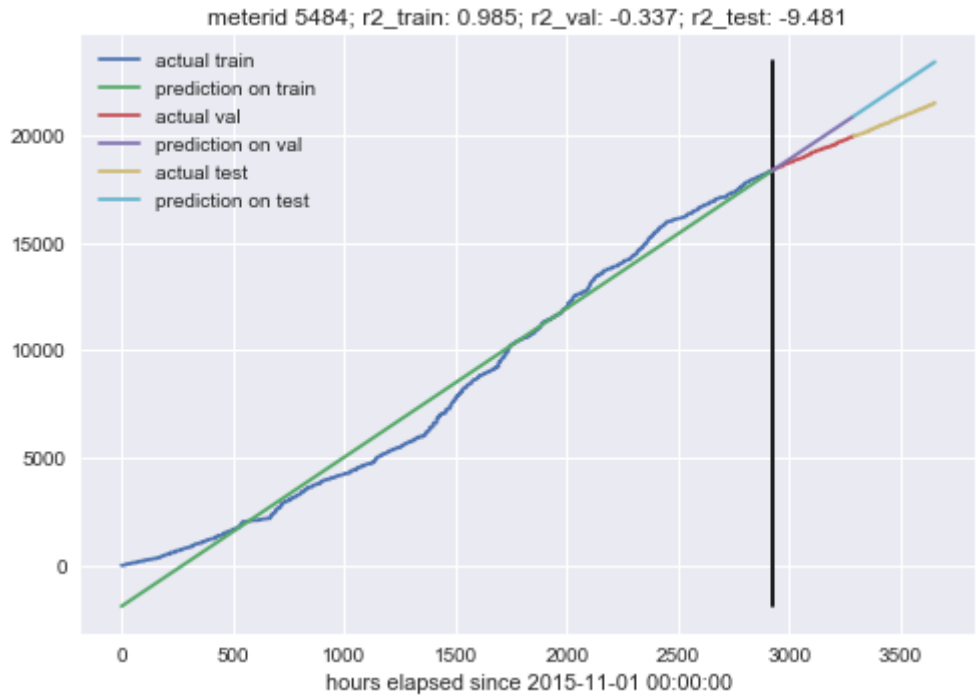

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

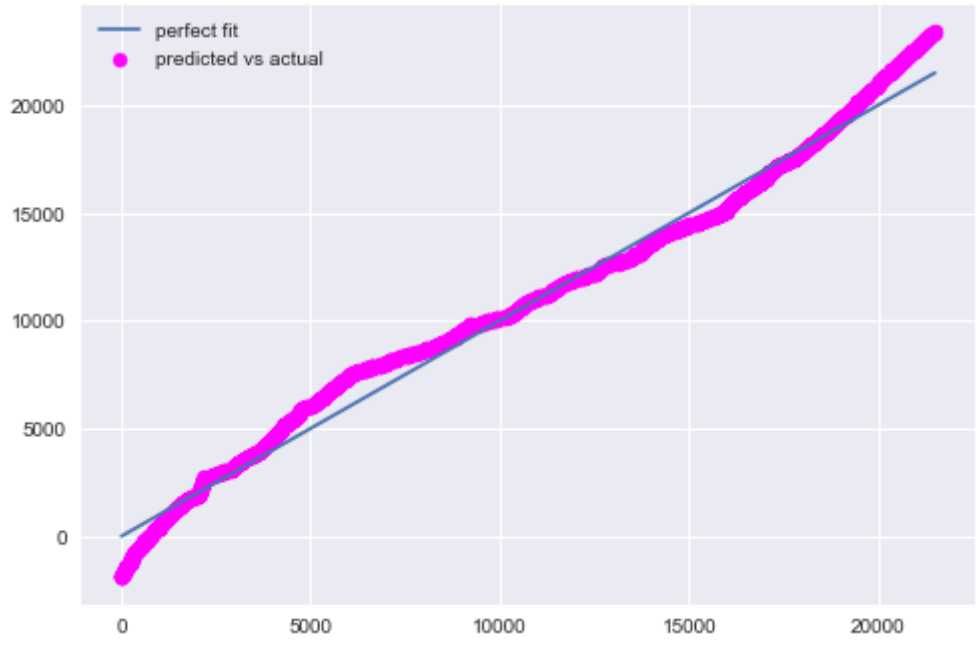

meterid 5403; r2_train: 0.975; r2_val: -5.710; r2_test: -31.677
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

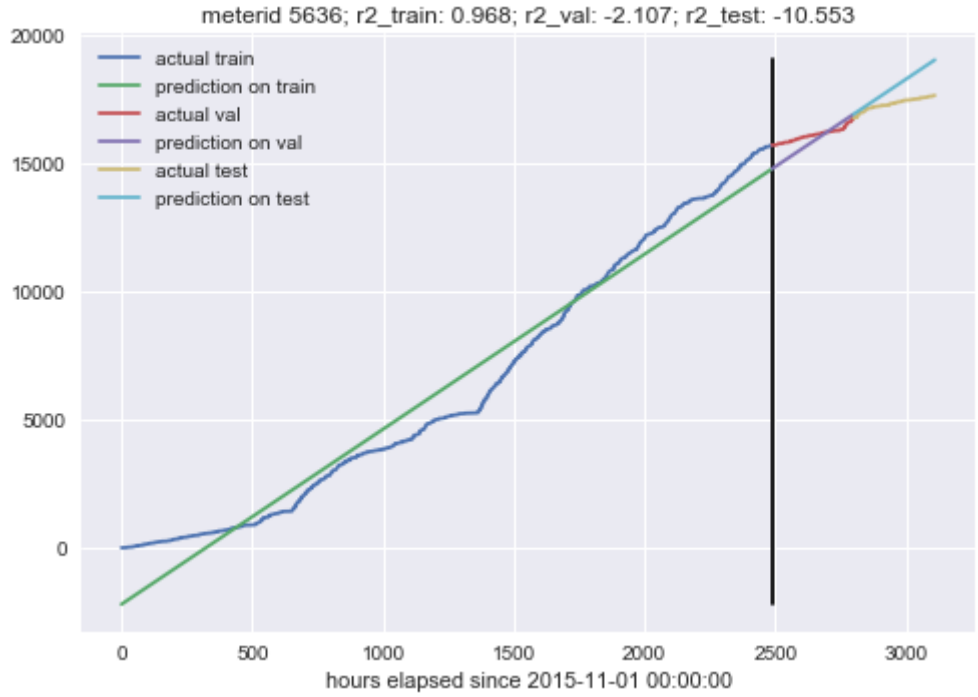

perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000

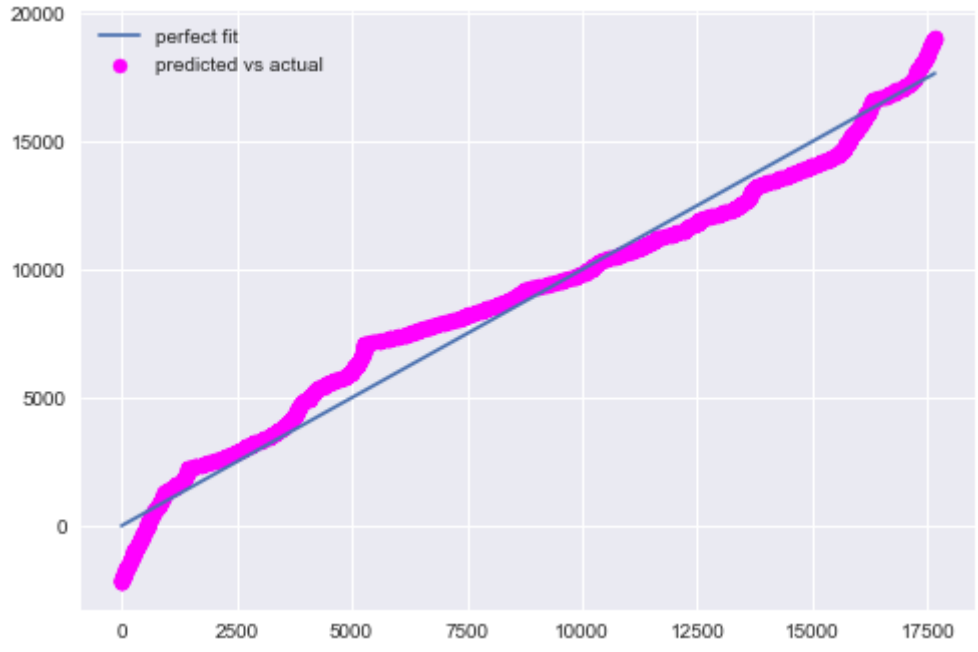

meterid 5439; r2_train: 0.951; r2_val: -7.777; r2_test: -19.416
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

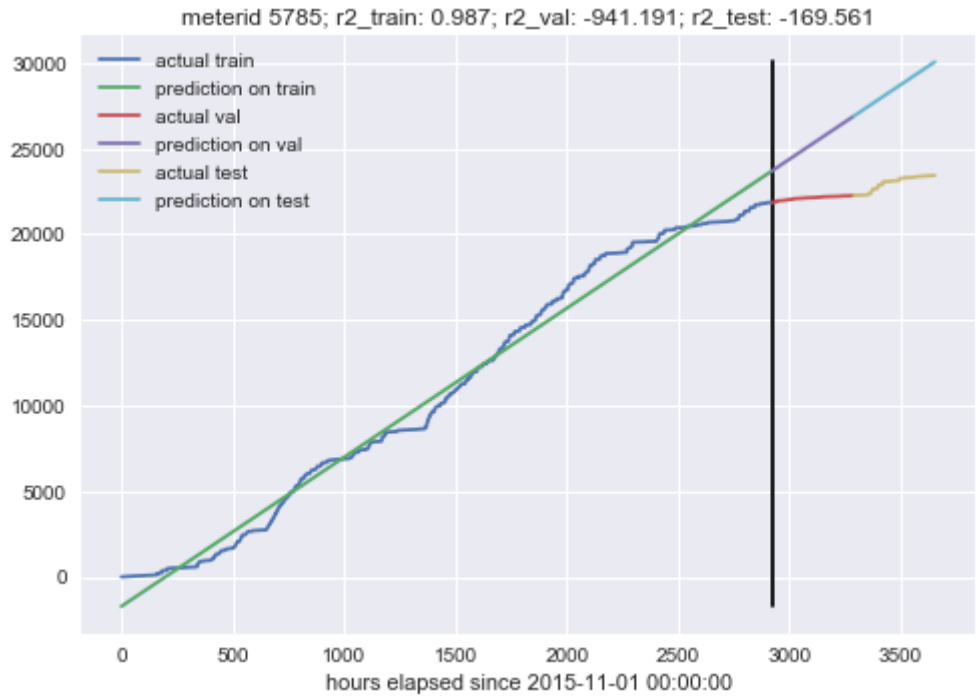

perfect fit
predicted vs actual
15000
12500
10000
7500
5000
2500
0
−2500
0
2000
4000
6000
8000
10000
12000
14000

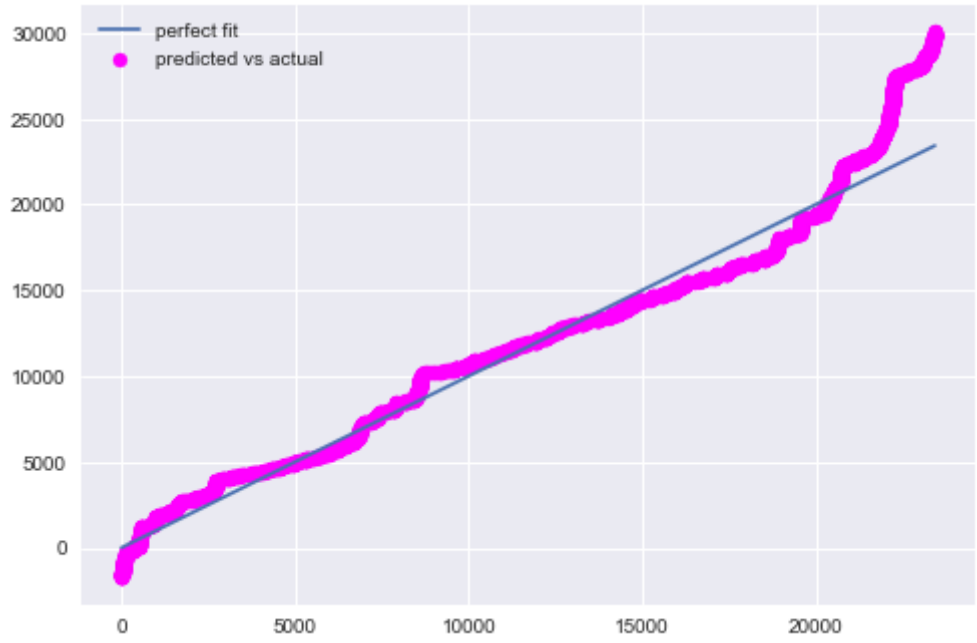

meterid 5484; r2_train: 0.985; r2_val: -0.337; r2_test: -9.481
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

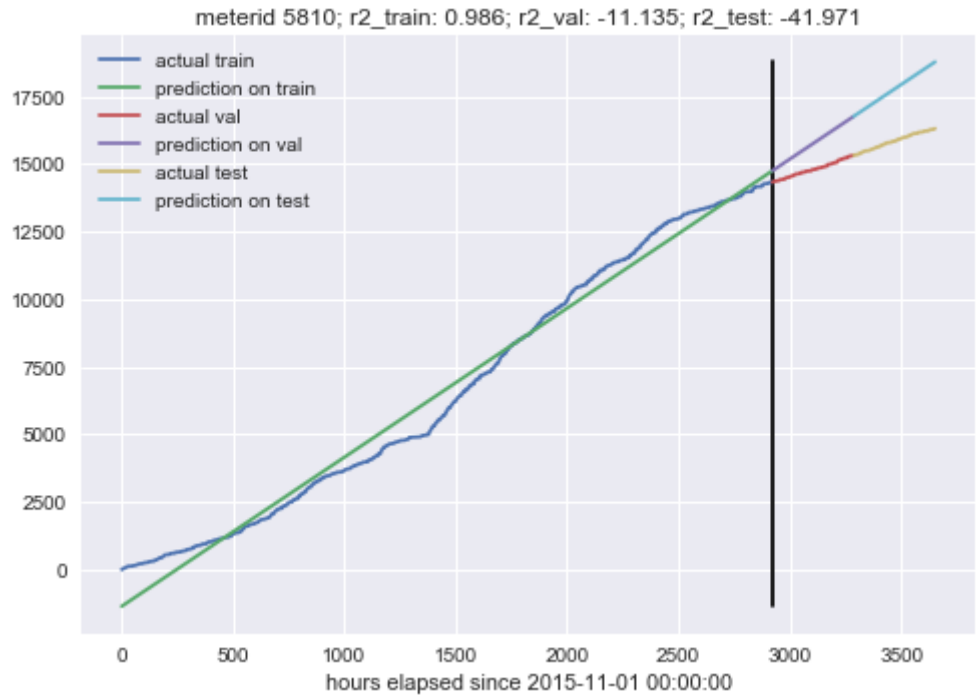

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
5000
10000
15000
20000

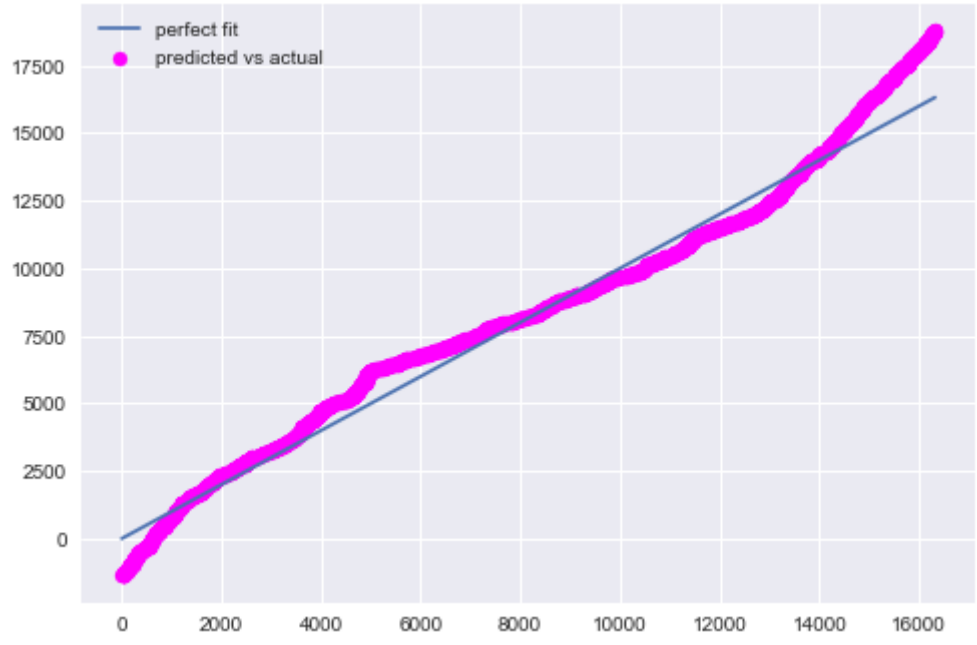

meterid 5636; r2_train: 0.968; r2_val: -2.107; r2_test: -10.553
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

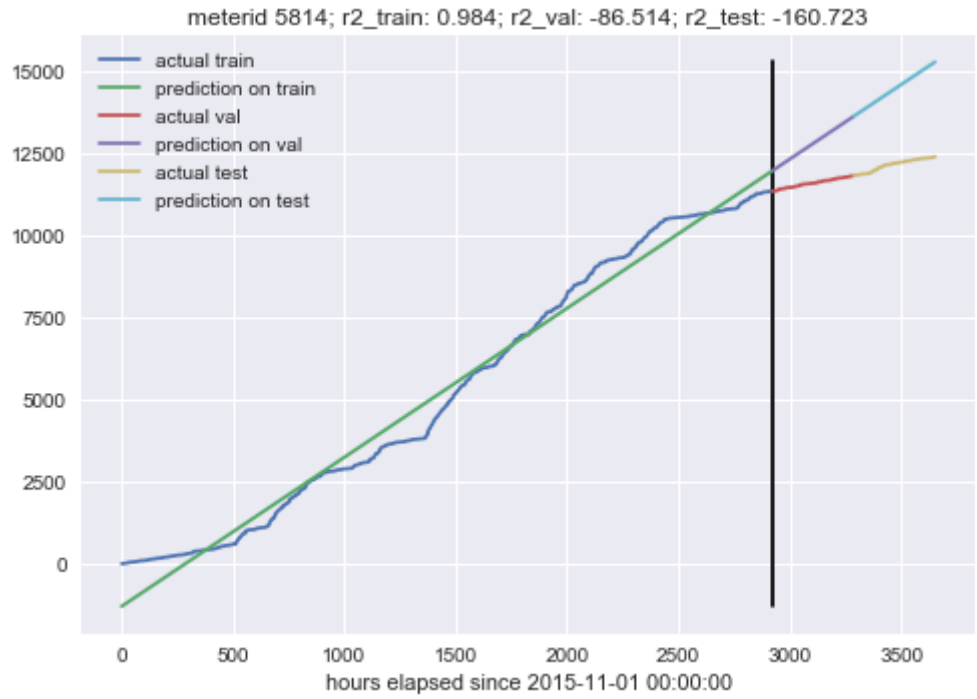

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500

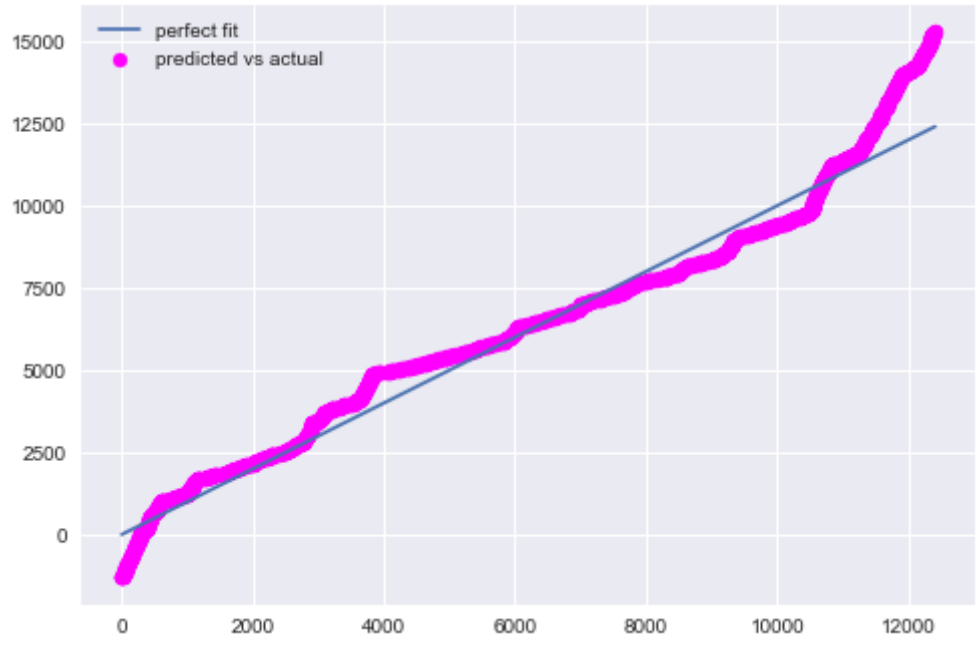

meterid 5785; r2_train: 0.987; r2_val: -941.191; r2_test: -169.561
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

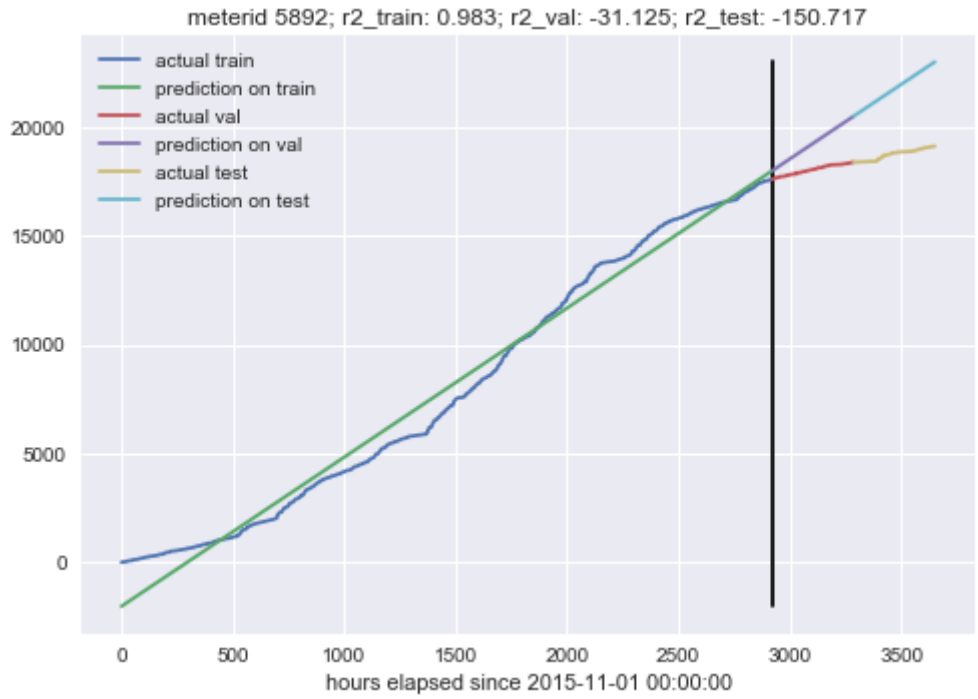

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

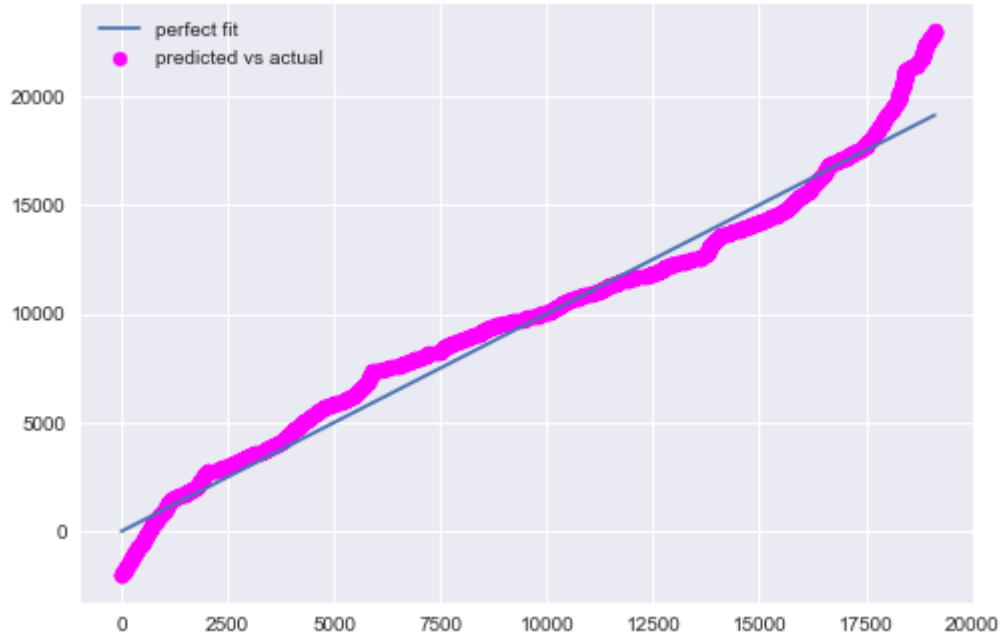

meterid 5810; r2_train: 0.986; r2_val: -11.135; r2_test: -41.971
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

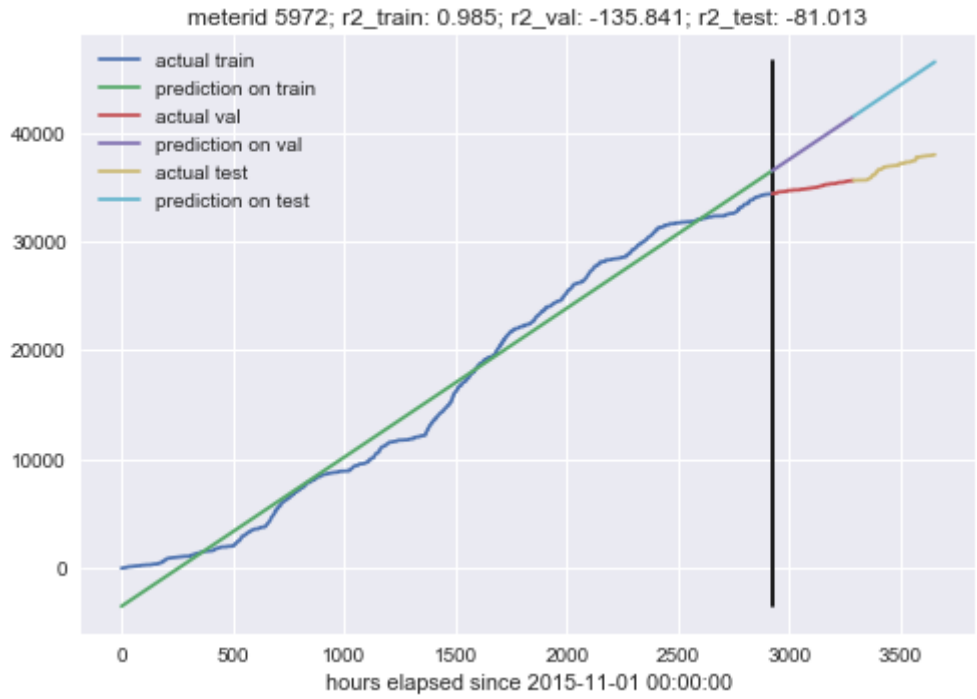

perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000
16000

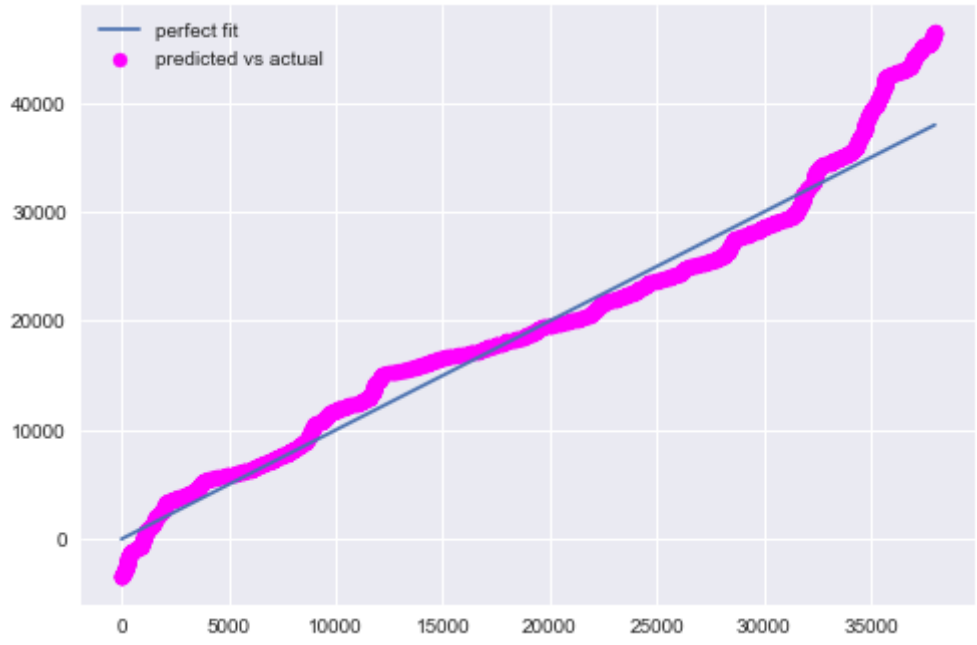

meterid 5814; r2_train: 0.984; r2_val: -86.514; r2_test: -160.723
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

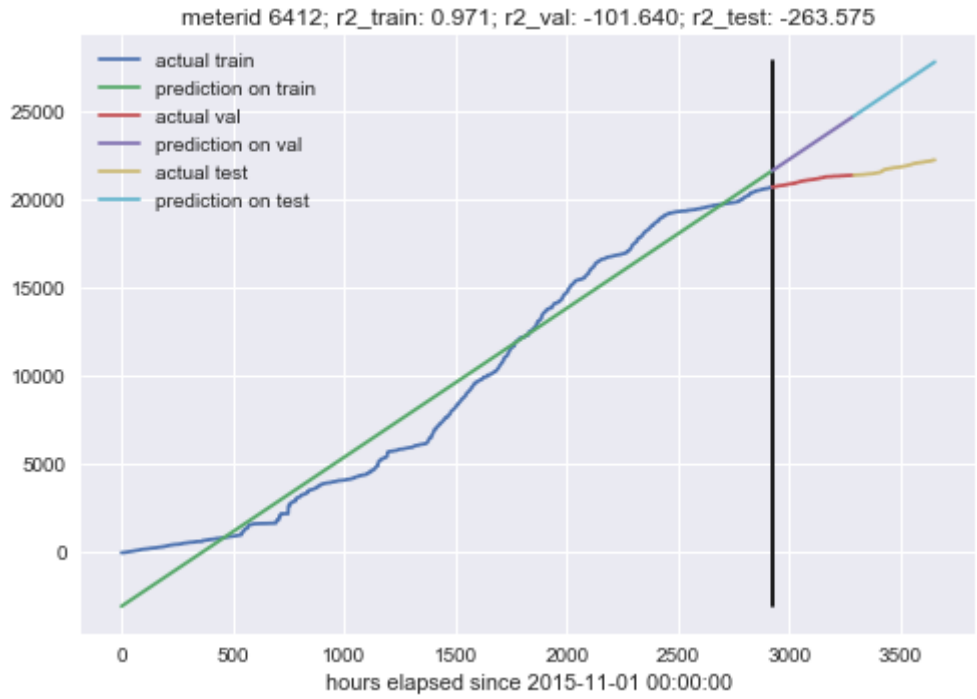

perfect fit
predicted vs actual
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000

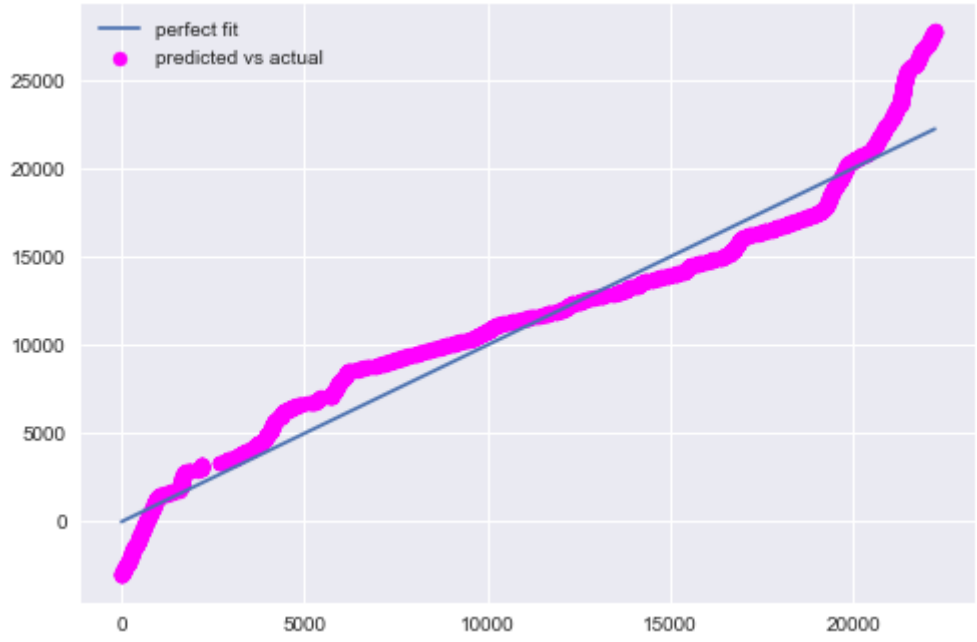

meterid 5892; r2_train: 0.983; r2_val: -31.125; r2_test: -150.717
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

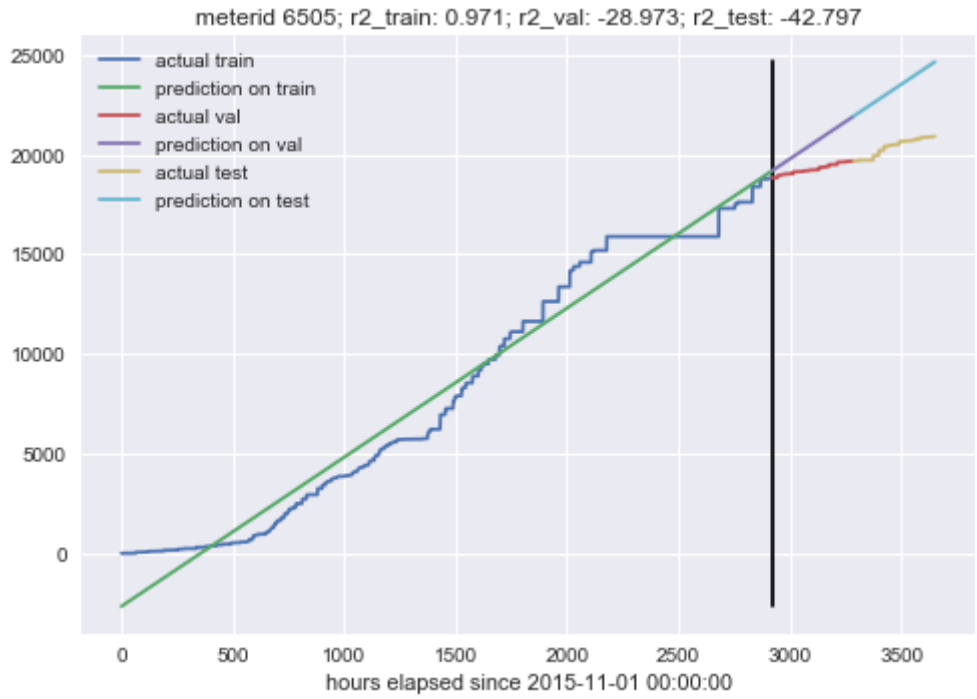

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
20000

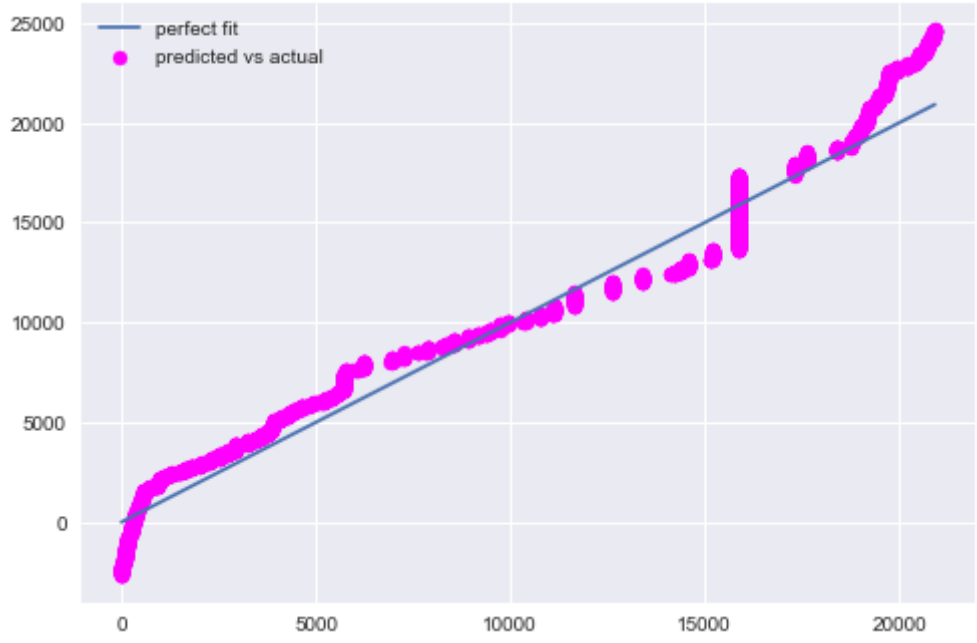

meterid 5972; r2_train: 0.985; r2_val: -135.841; r2_test: -81.013
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
40000
30000
20000
10000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

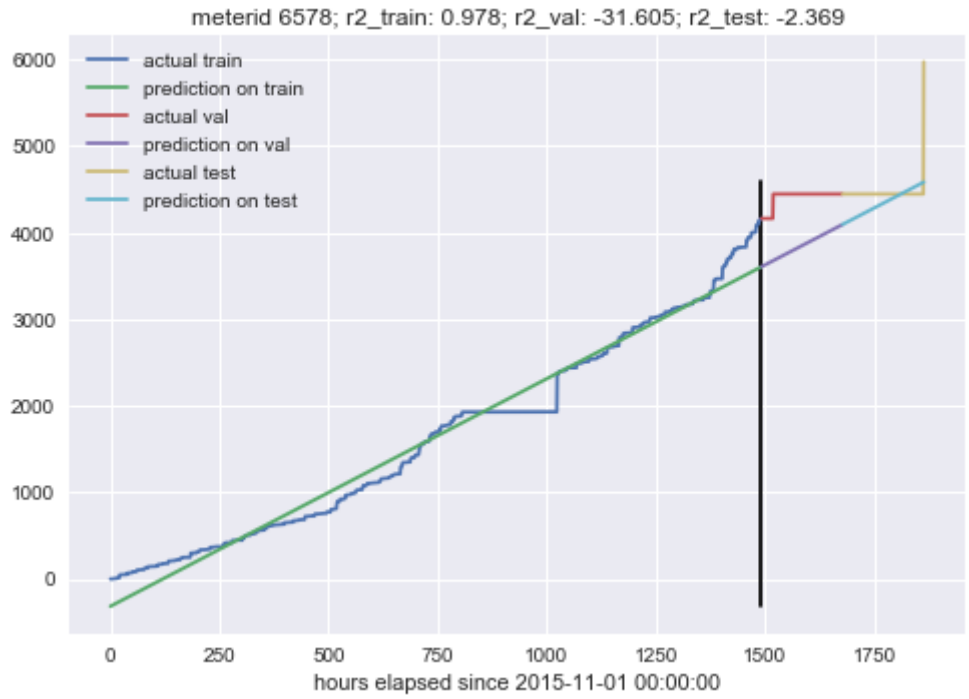

perfect fit
predicted vs actual
40000
30000
20000
10000
0
0
5000
10000
15000
20000
25000
30000
35000

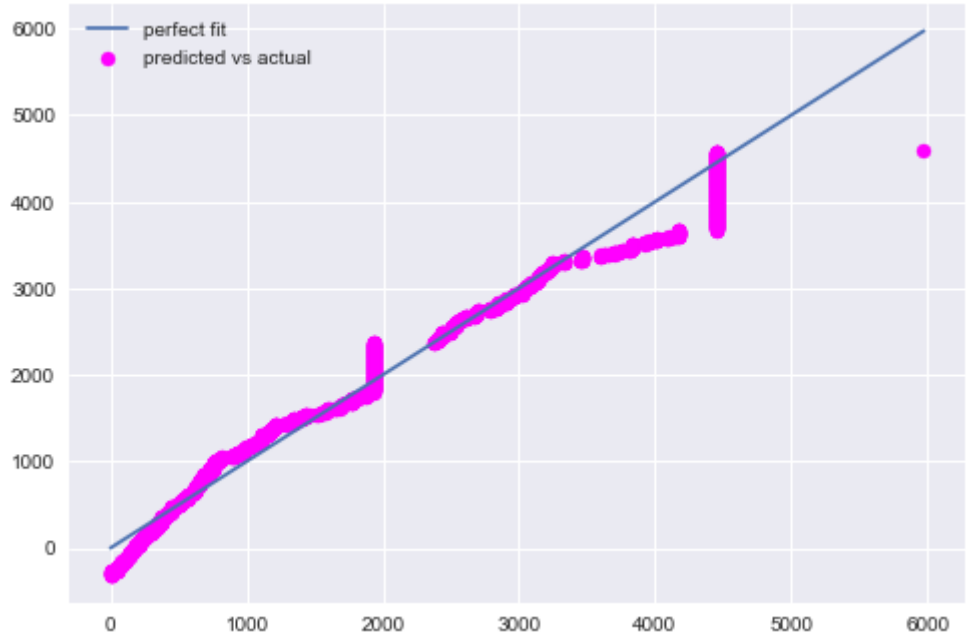

meterid 6412; r2_train: 0.971; r2_val: -101.640; r2_test: -263.575
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

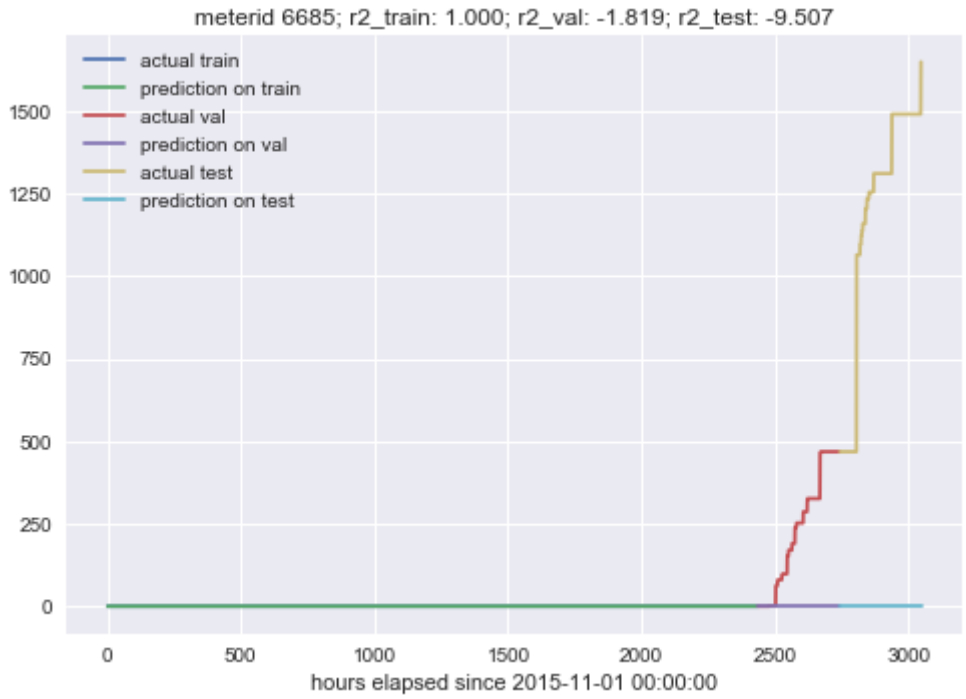

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

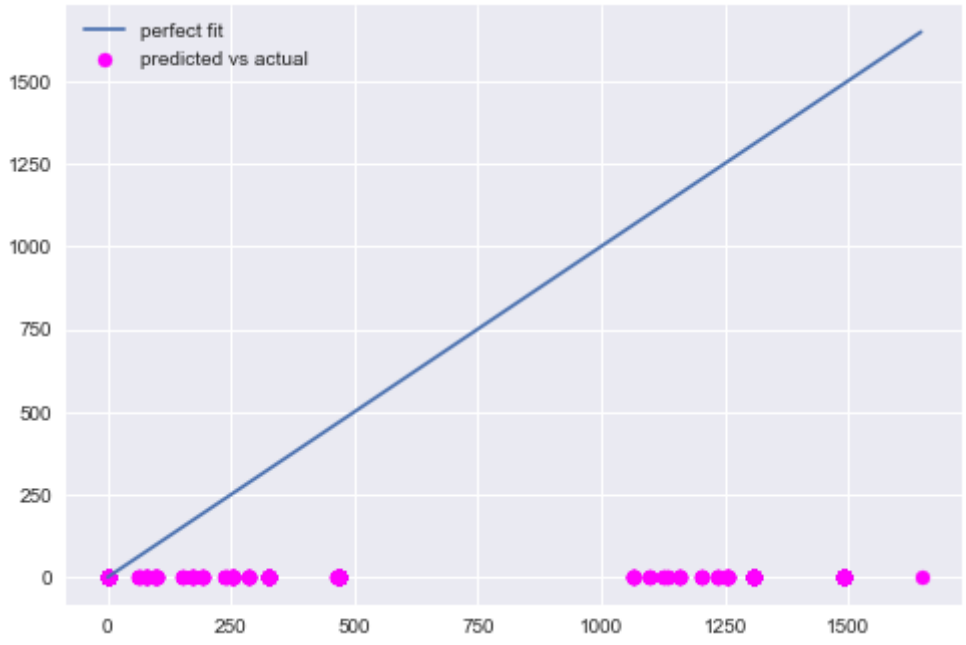

meterid 6505; r2_train: 0.971; r2_val: -28.973; r2_test: -42.797
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

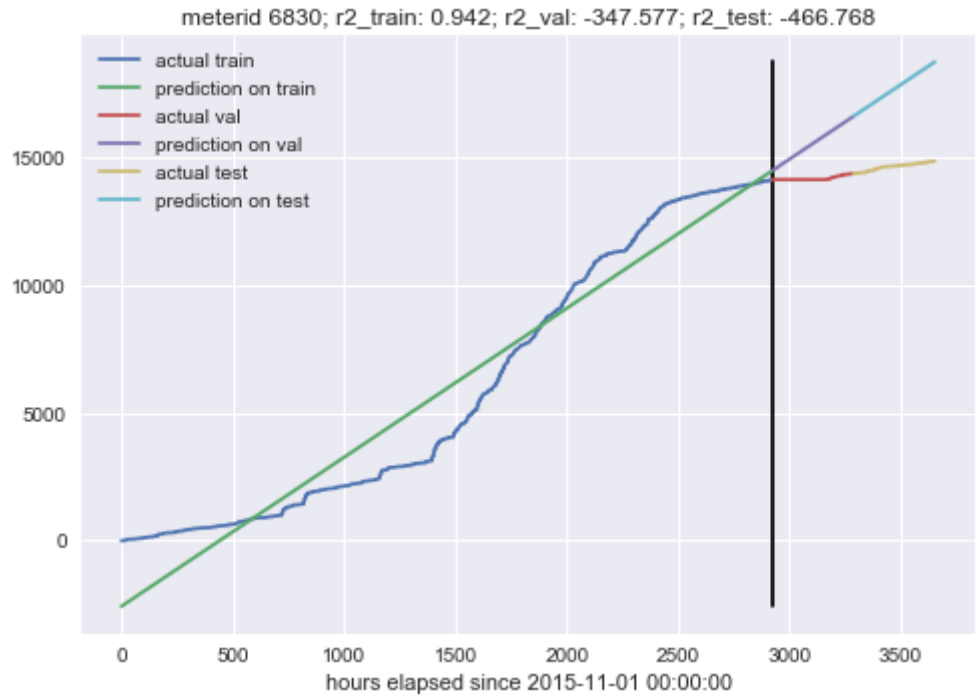

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

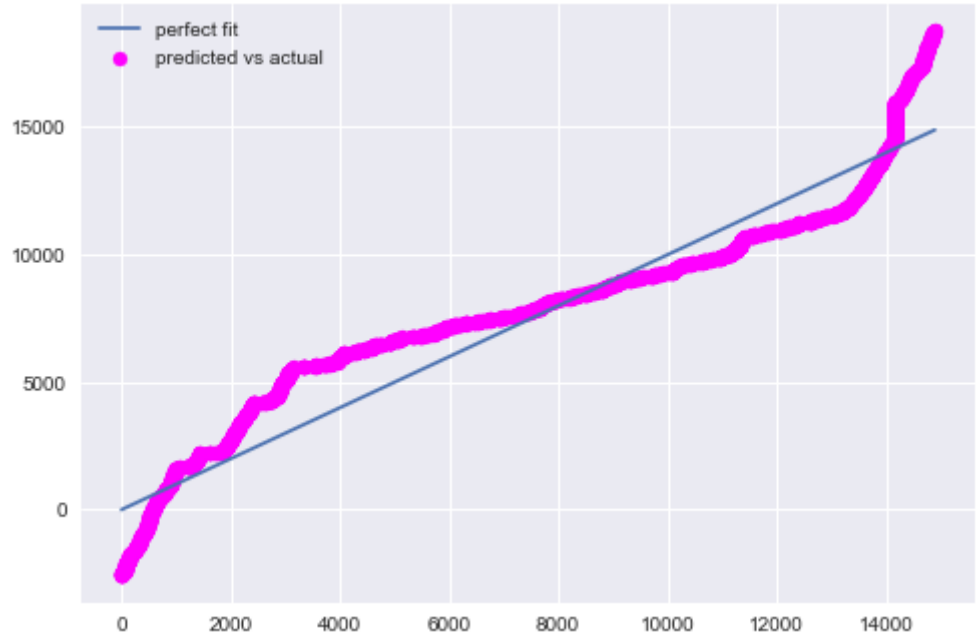

meterid 6578; r2_train: 0.978; r2_val: -31.605; r2_test: -2.369
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
6000
5000
4000
3000
2000
1000
0
0
250
500
750
1000
1250
1500
1750
hours elapsed since 2015-11-01 00:00:00

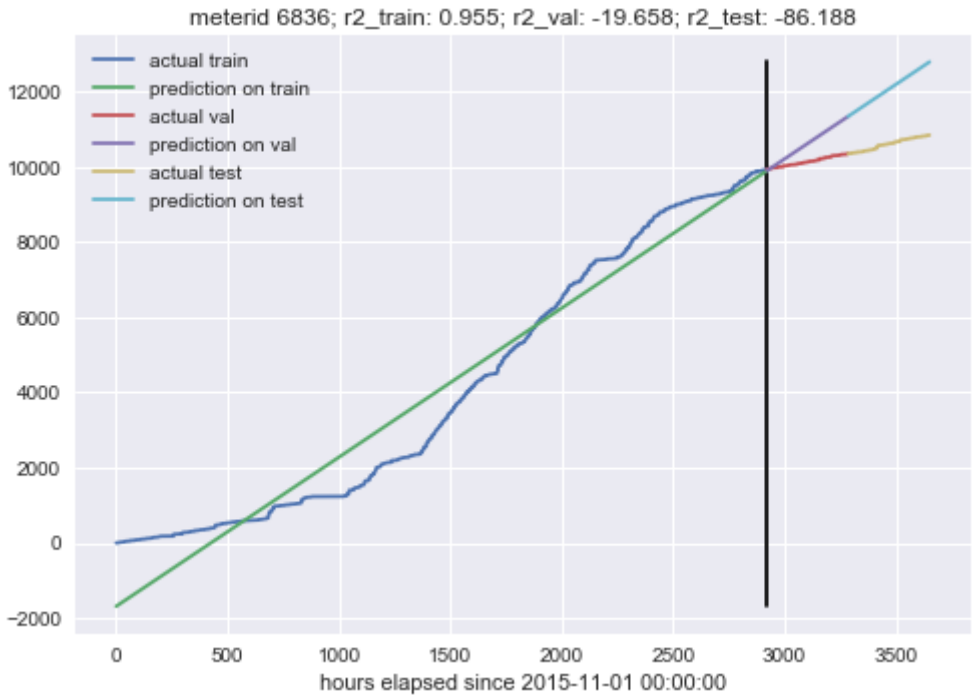

perfect fit
predicted vs actual
6000
5000
4000
3000
2000
1000
0
0
1000
2000
3000
4000
5000
6000

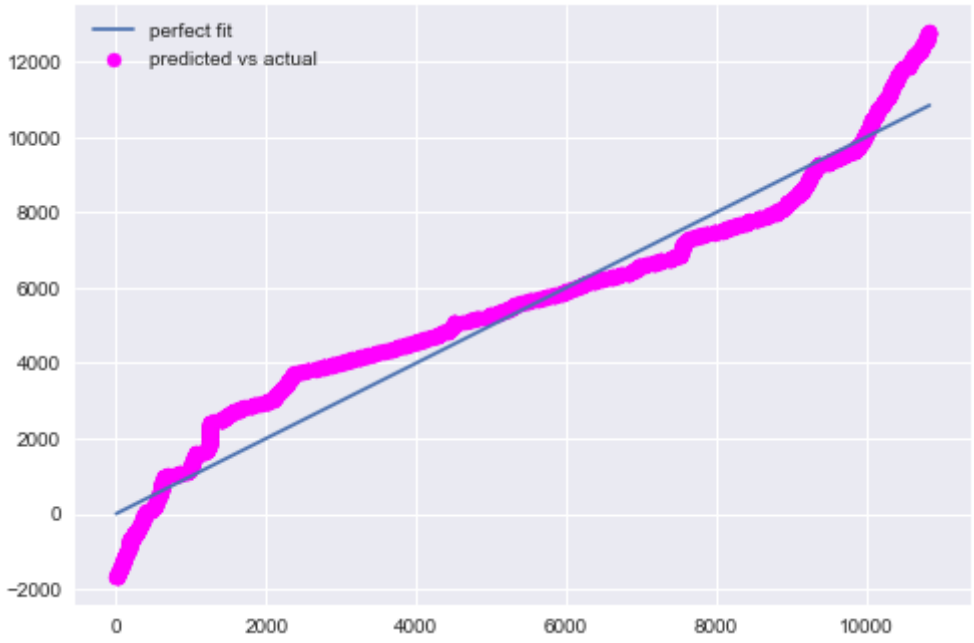

meterid 6685; r2_train: 1.000; r2_val: -1.819; r2_test: -9.507
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
1500
1250
1000
750
500
250
0
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

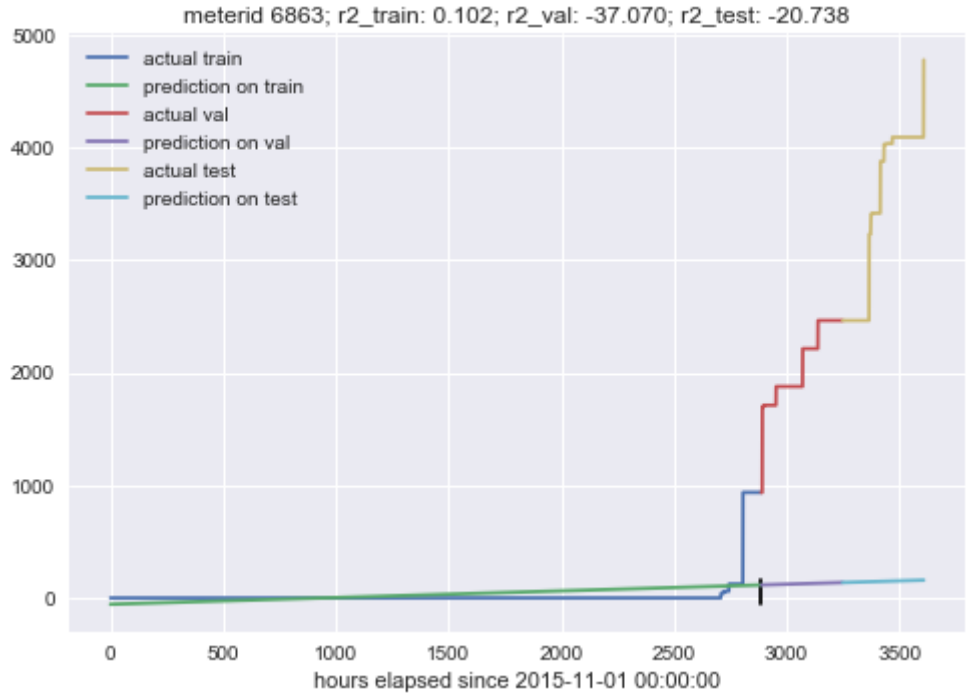

perfect fit
predicted vs actual
1500
1250
1000
750
500
250
0
0
250
500
750
1000
1250
1500

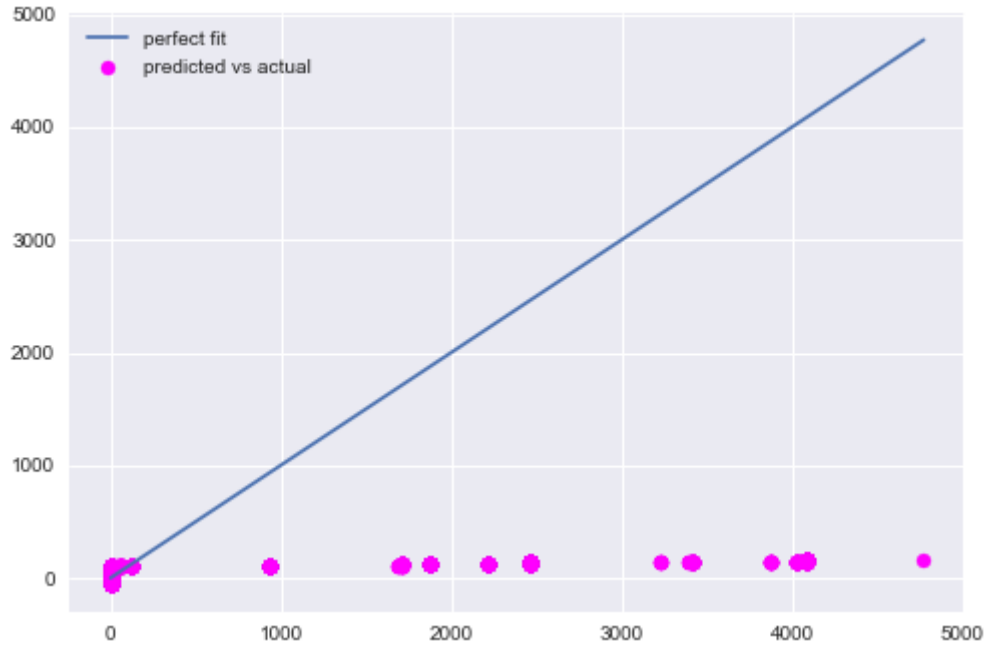

meterid 6830; r2_train: 0.942; r2_val: -347.577; r2_test: -466.768
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

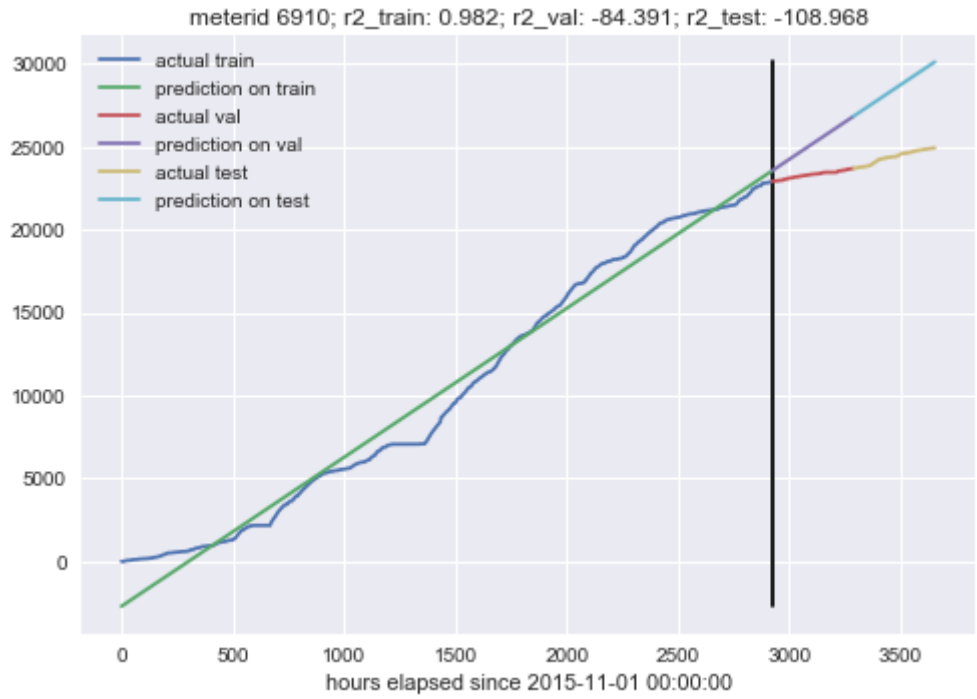

perfect fit
predicted vs actual
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000

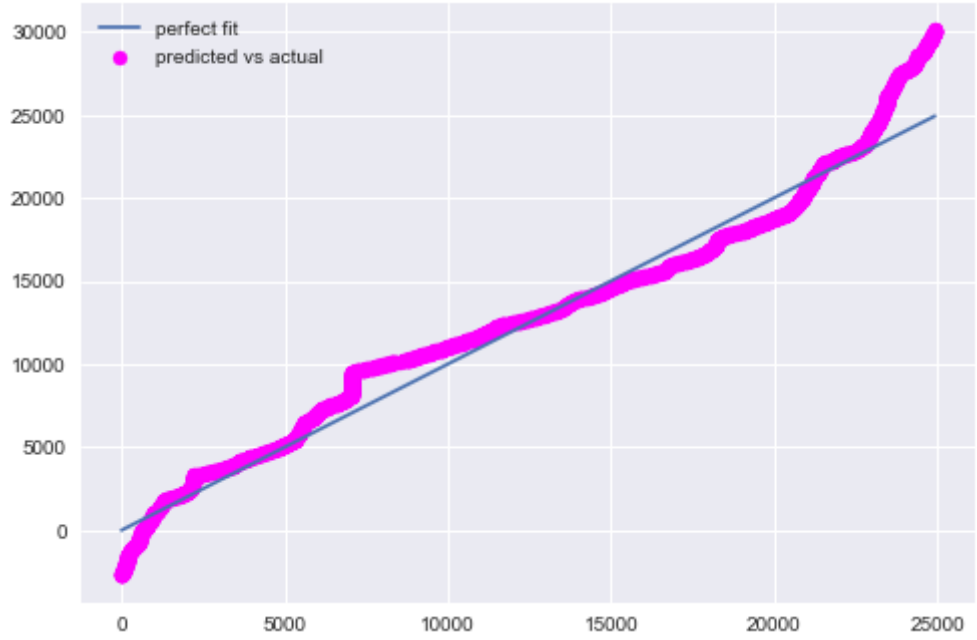

meterid 6836; r2_train: 0.955; r2_val: -19.658; r2_test: -86.188
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

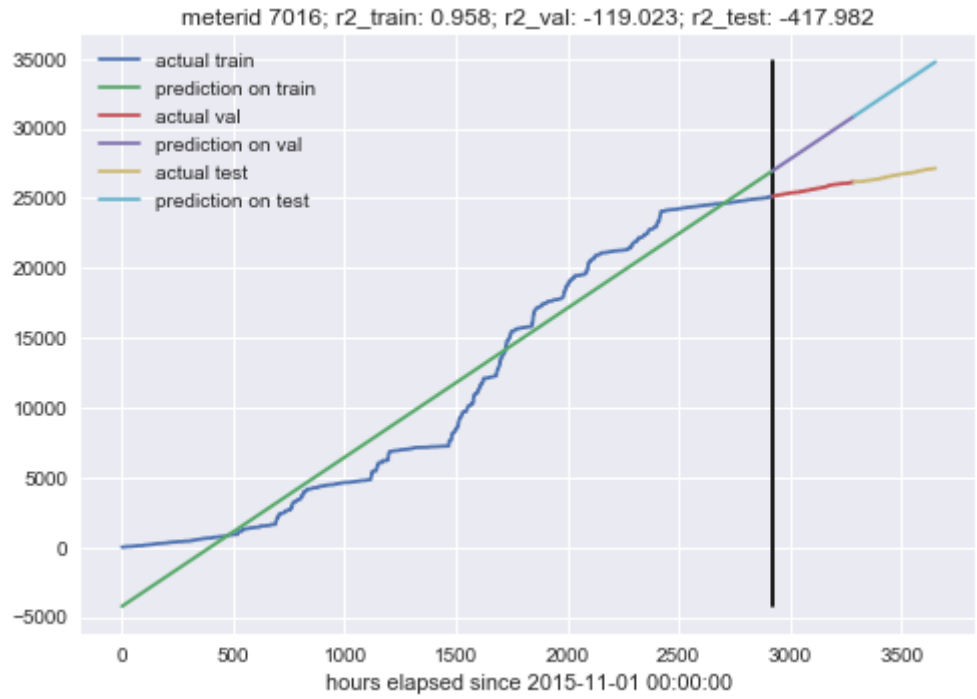

perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000

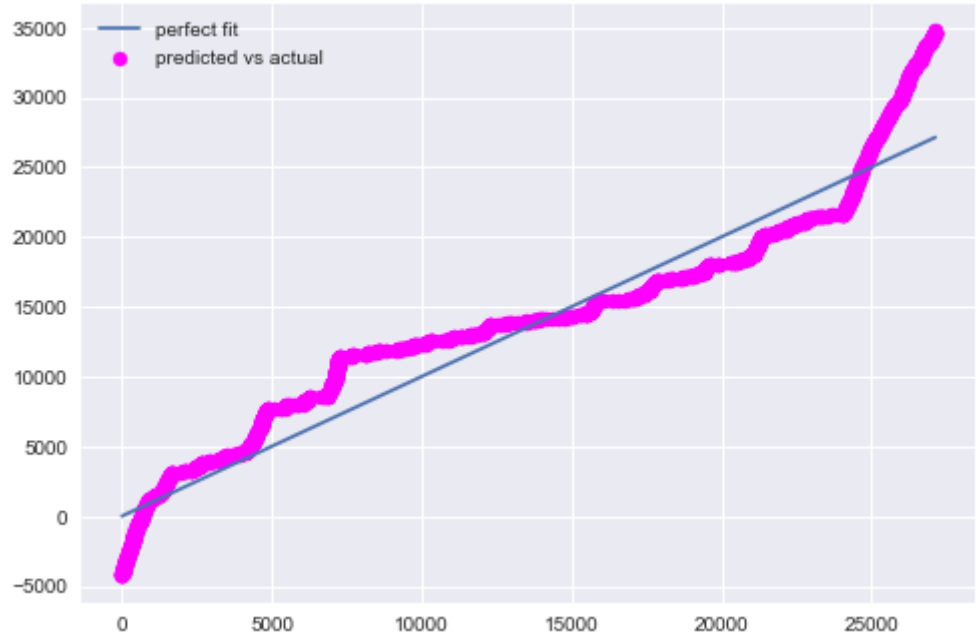

meterid 6863; r2_train: 0.102; r2_val: -37.070; r2_test: -20.738
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

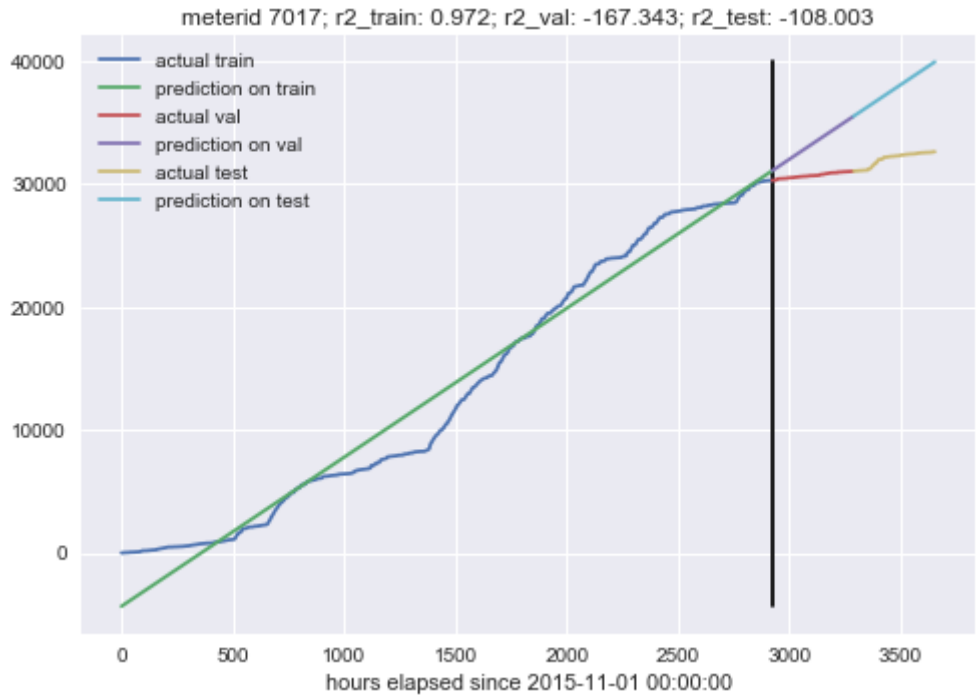

perfect fit
predicted vs actual
5000
4000
3000
2000
1000
0
0
1000
2000
3000
4000
5000

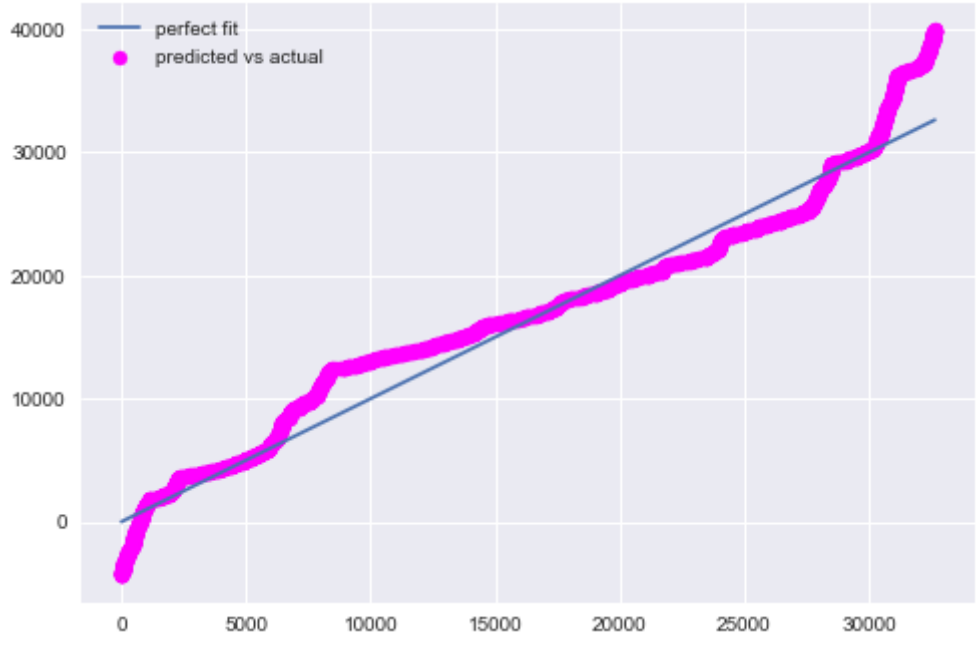

meterid 6910; r2_train: 0.982; r2_val: -84.391; r2_test: -108.968
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

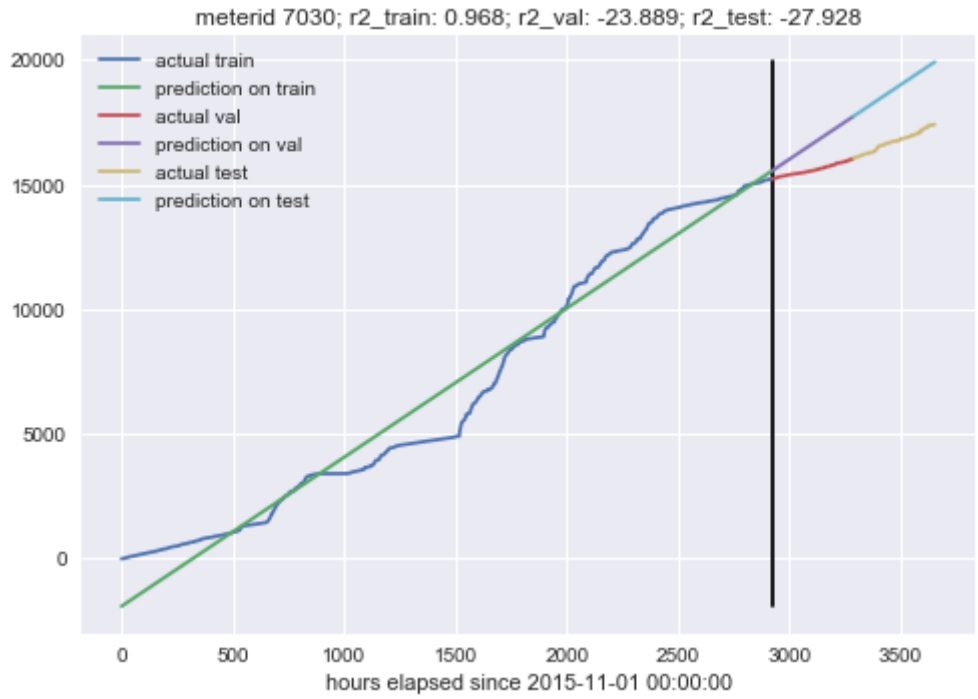

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000
25000


meterid 7016; r2_train: 0.958; r2_val: -119.023; r2_test: -417.982
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000


meterid 7017; r2_train: 0.972; r2_val: -167.343; r2_test: -108.003
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
40000
30000
20000
10000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
40000
30000
20000
10000
0
0
5000
10000
15000
20000
25000
30000


meterid 7030; r2_train: 0.968; r2_val: -23.889; r2_test: -27.928
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
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10000
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1500
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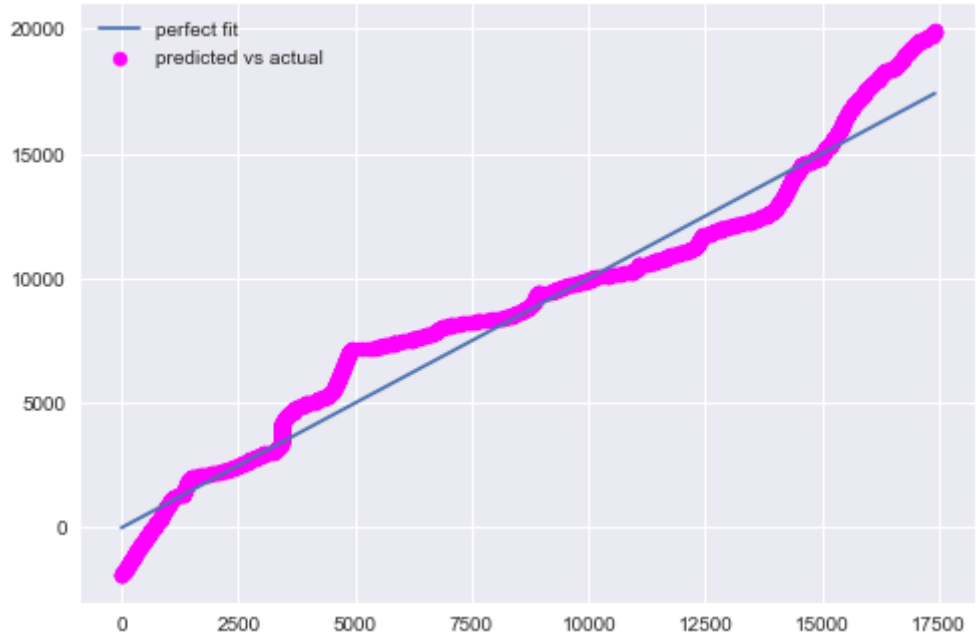
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
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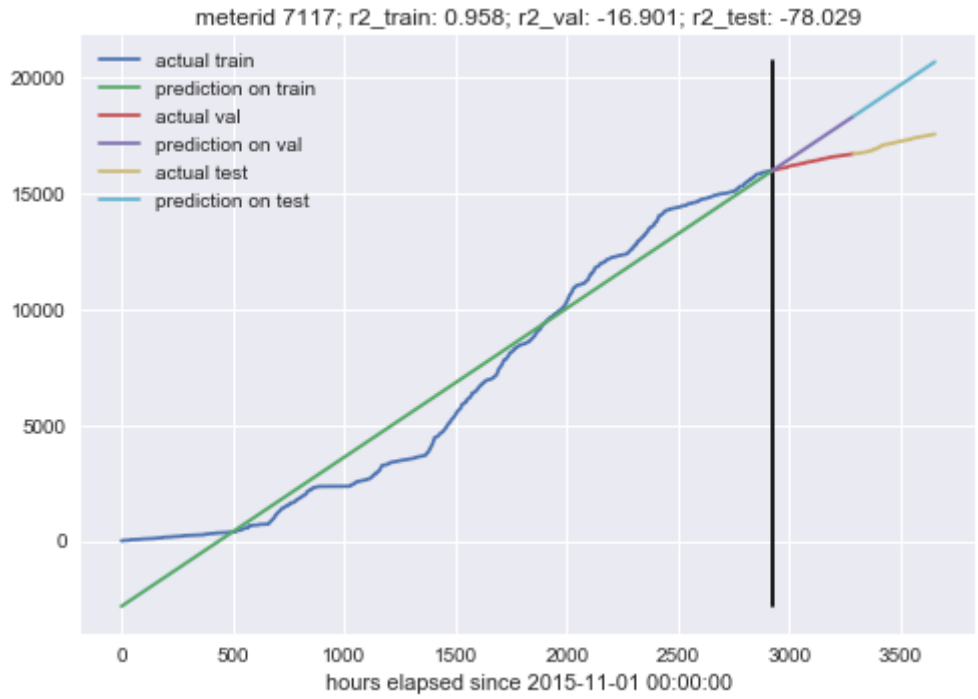
5000
7500
10000
12500
15000
17500


meterid 7117; r2_train: 0.958; r2_val: -16.901; r2_test: -78.029
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
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10000
5000
0
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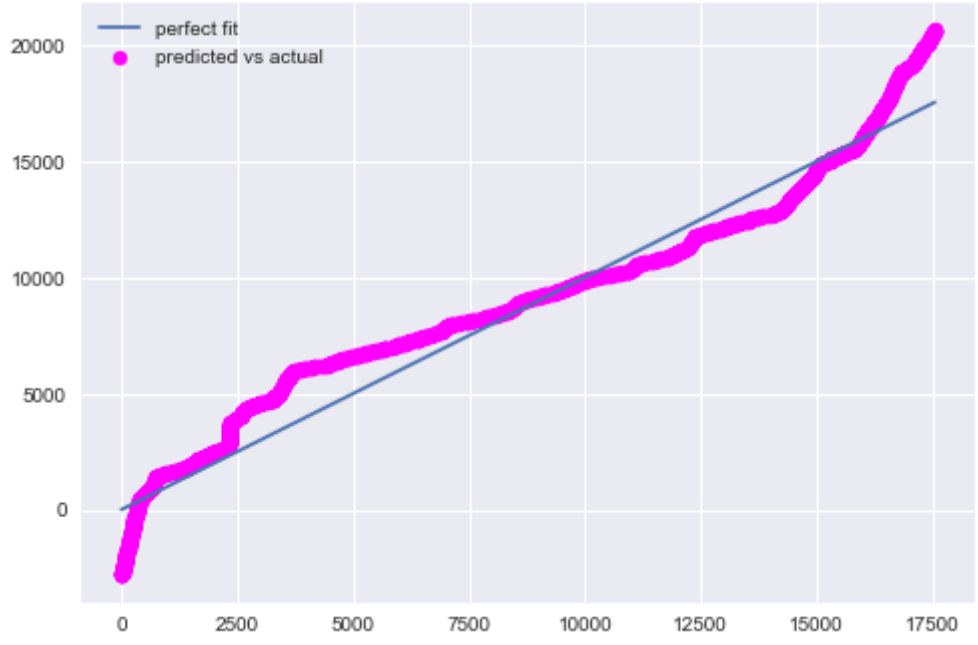
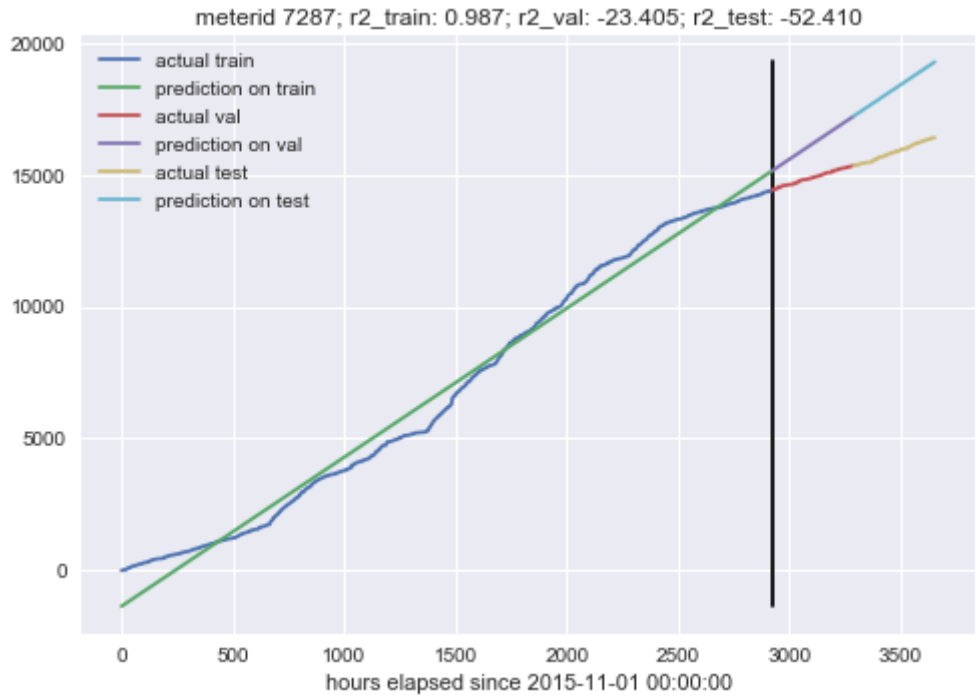
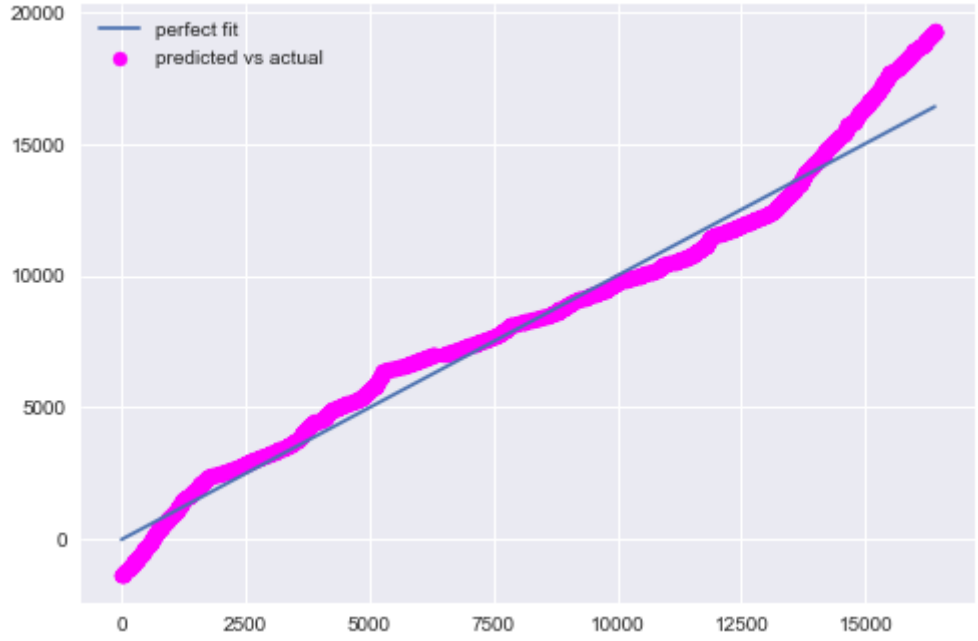
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500


meterid 7287; r2_train: 0.987; r2_val: -23.405; r2_test: -52.410
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
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0
0
2500
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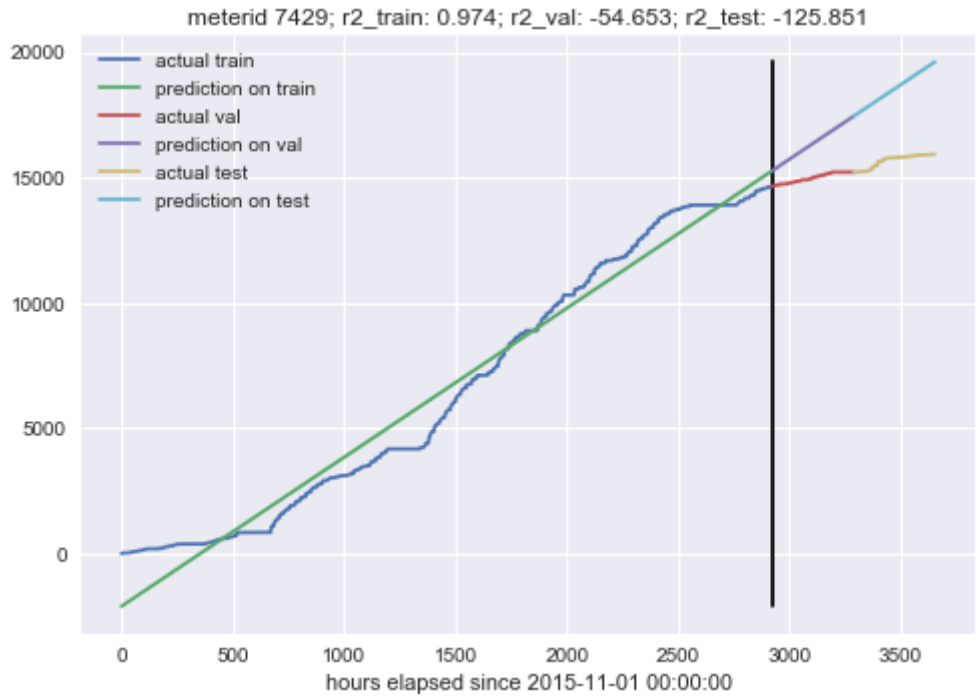
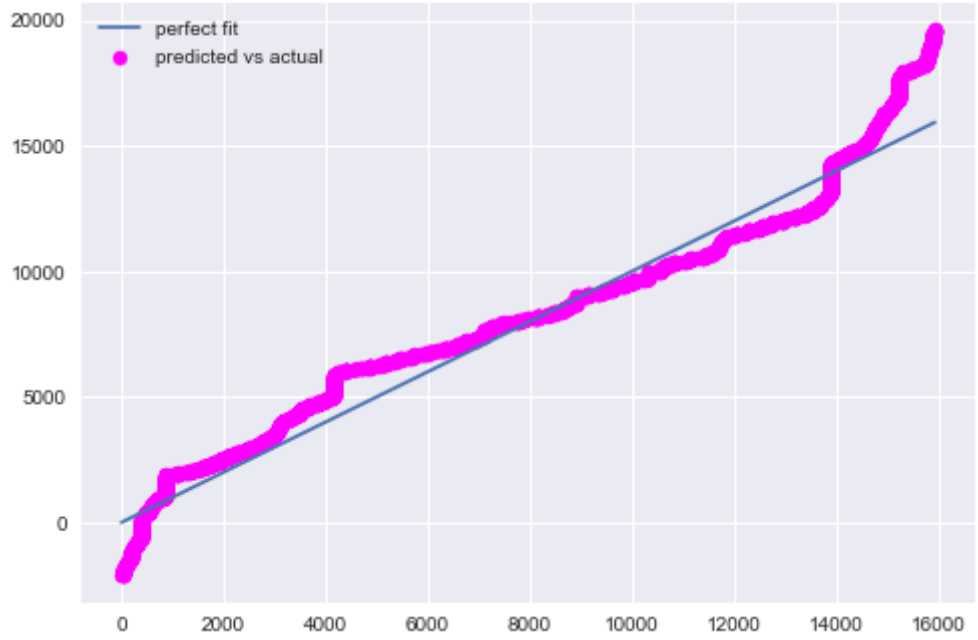
7500
10000
12500
15000


meterid 7429; r2_train: 0.974; r2_val: -54.653; r2_test: -125.851
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
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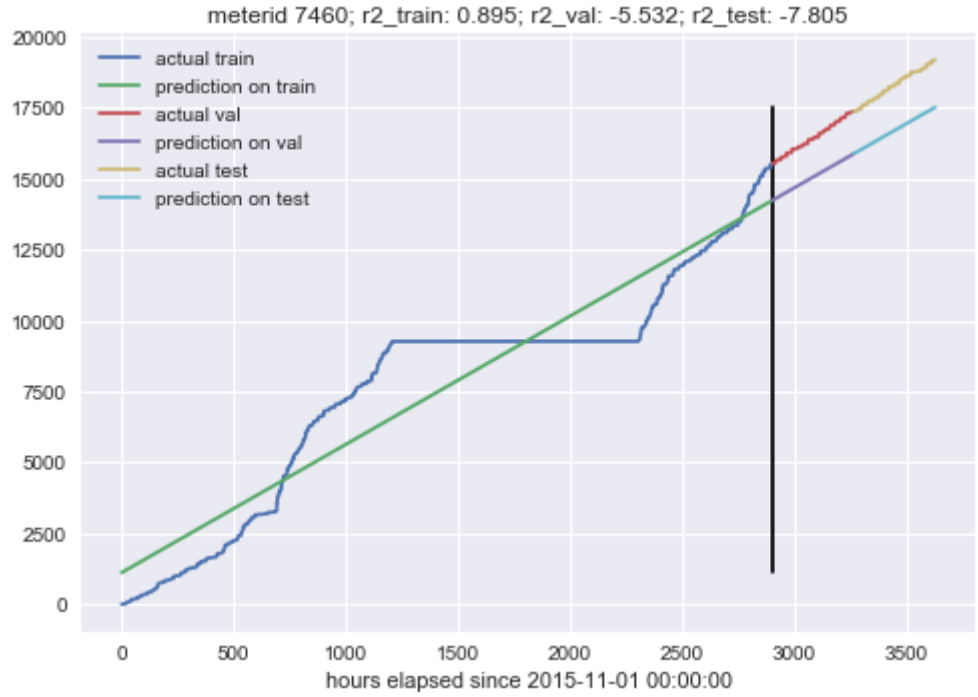
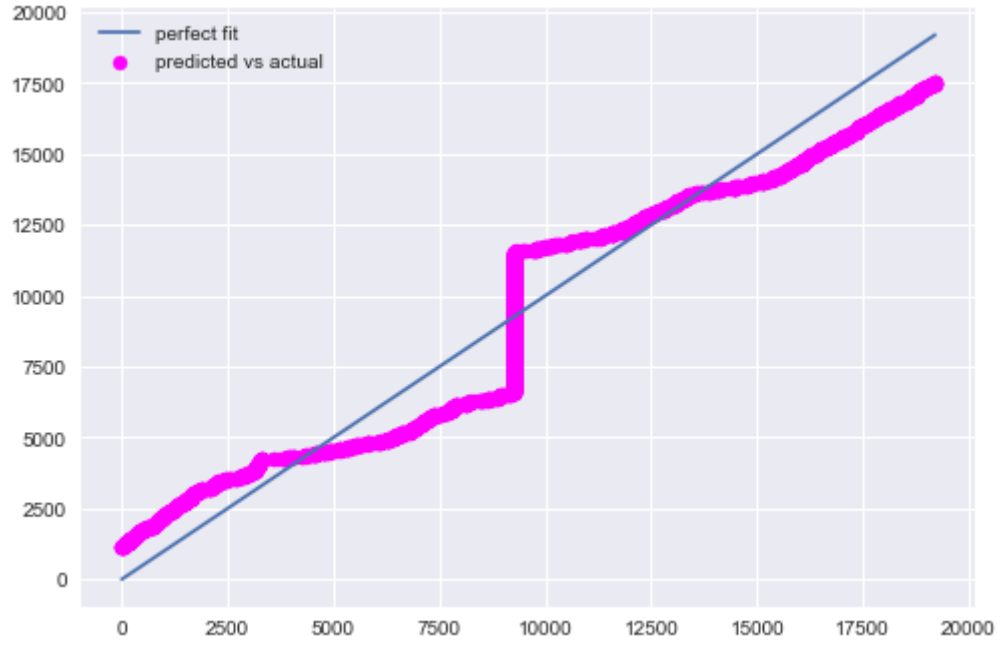
4000
6000
8000
10000
12000
14000
16000


meterid 7460; r2_train: 0.895; r2_val: -5.532; r2_test: -7.805
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
17500
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
17500
15000
12500
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7500
5000
2500
0
0
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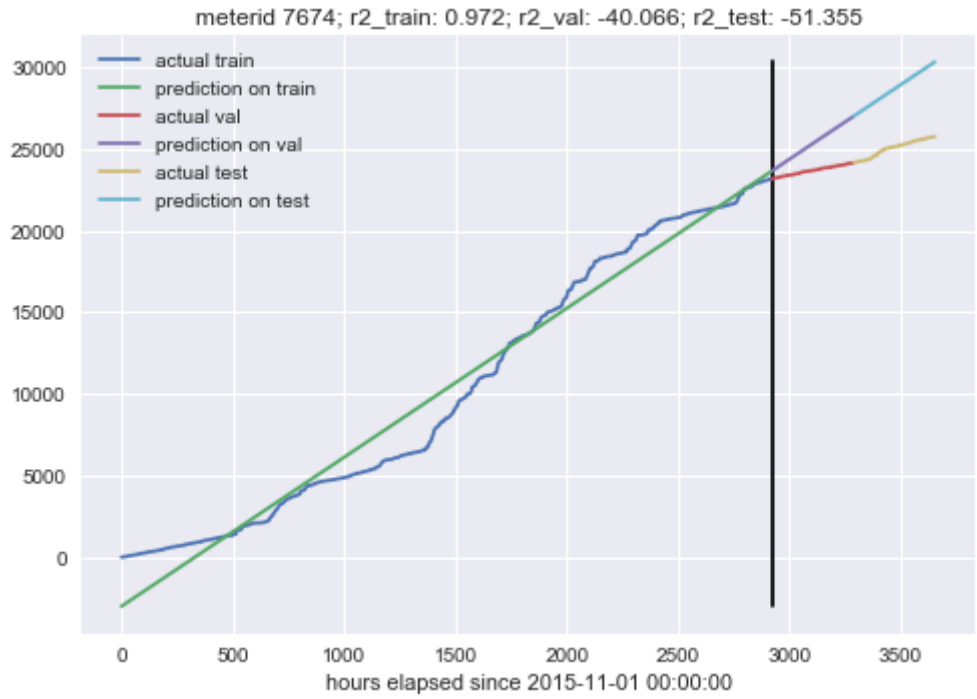
5000
7500
10000
12500
15000
17500
20000


meterid 7674; r2_train: 0.972; r2_val: -40.066; r2_test: -51.355
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
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0
0
500
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2500
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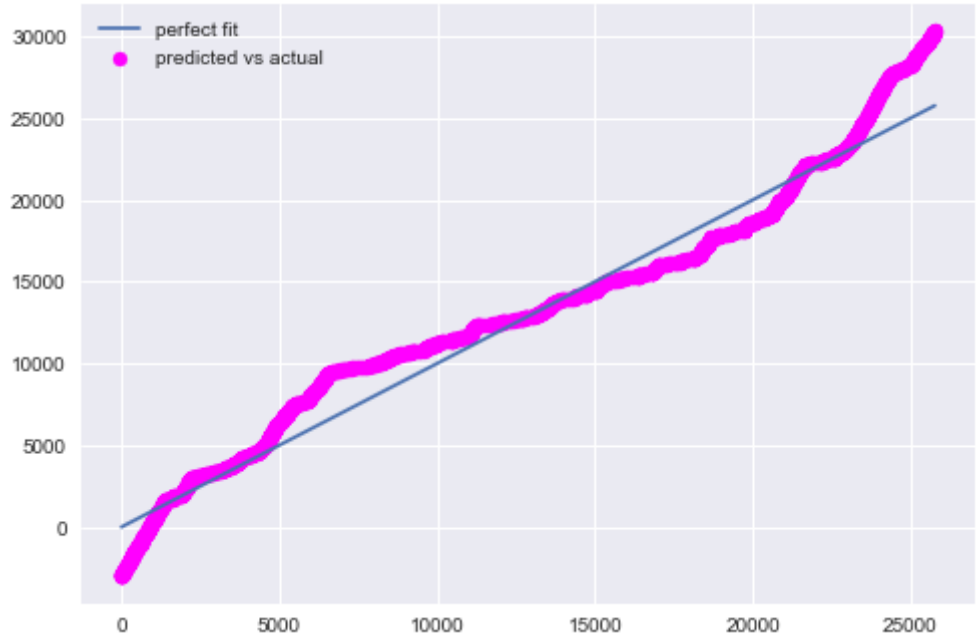
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
30000
25000
20000
15000
10000
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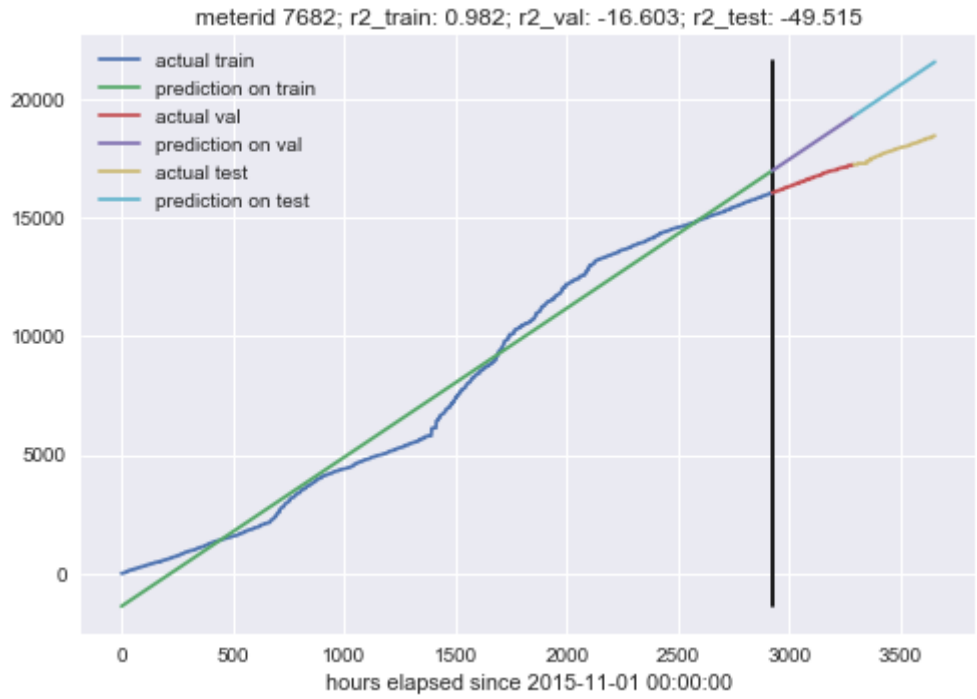
0
0
5000
10000
15000
20000
25000


meterid 7682; r2_train: 0.982; r2_val: -16.603; r2_test: -49.515
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
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500
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1500
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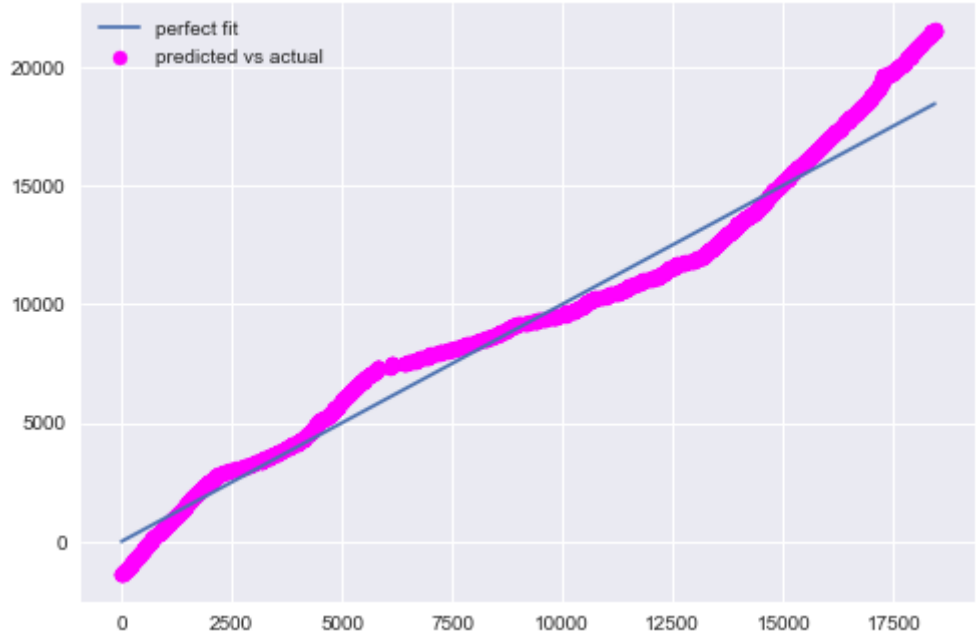
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
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0
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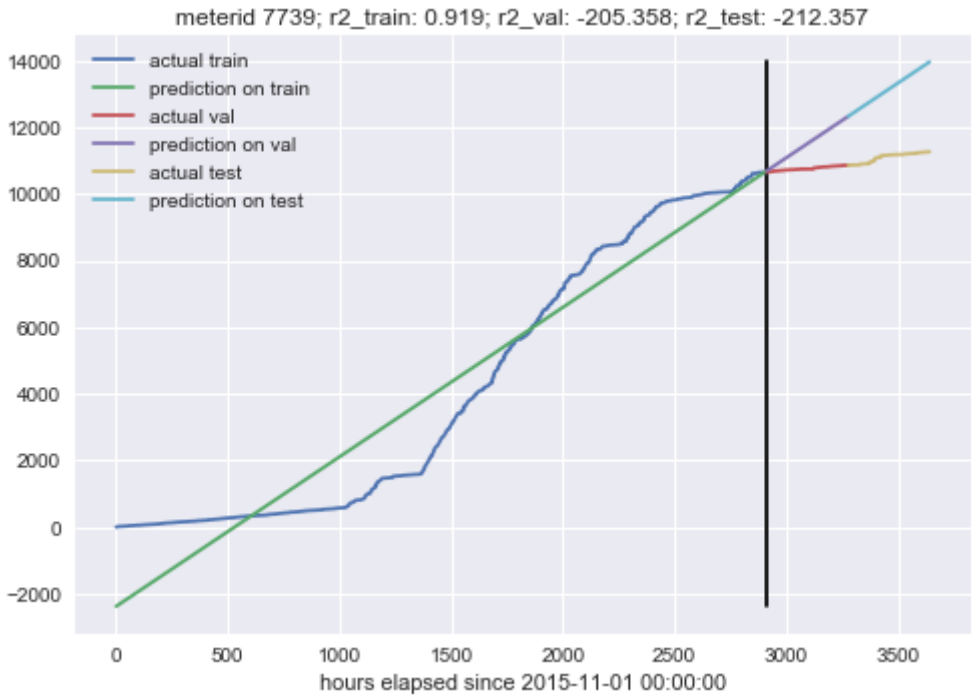
2500
5000
7500
10000
12500
15000
17500


meterid 7739; r2_train: 0.919; r2_val: -205.358; r2_test: -212.357
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
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−2000
0
500
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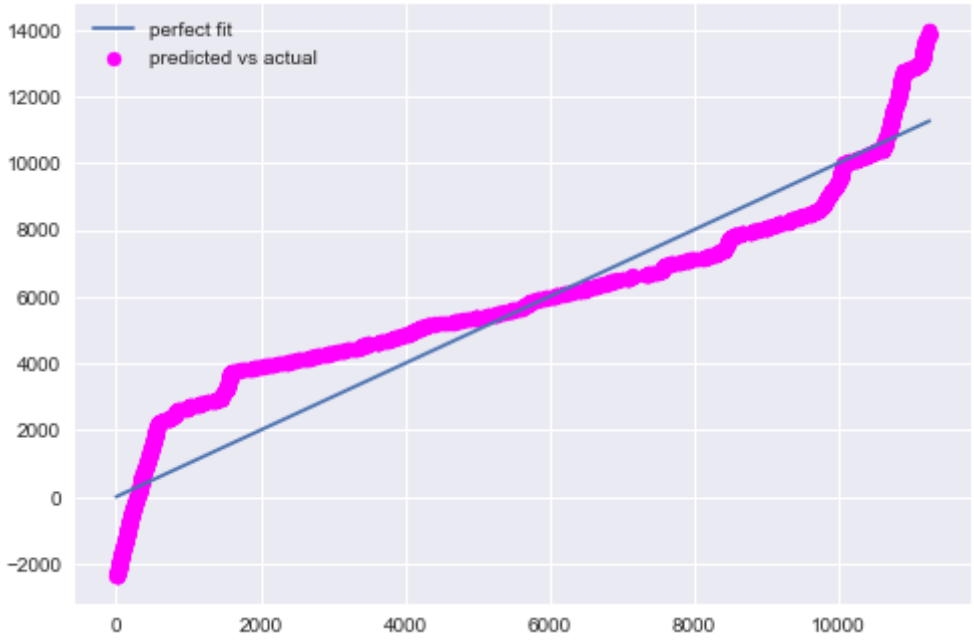
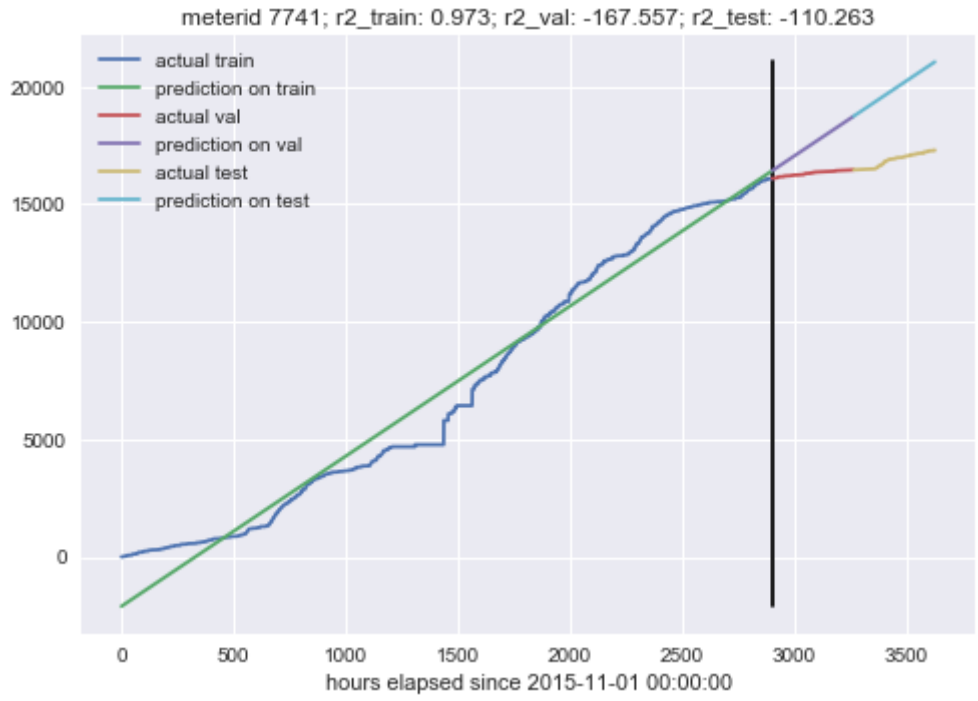
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000


meterid 7741; r2_train: 0.973; r2_val: -167.557; r2_test: -110.263
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
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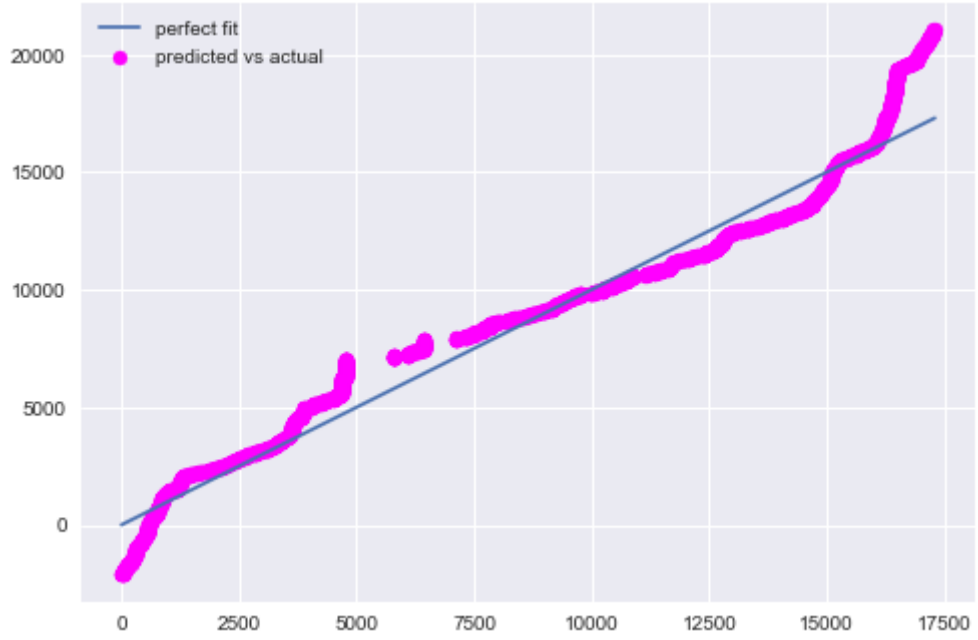
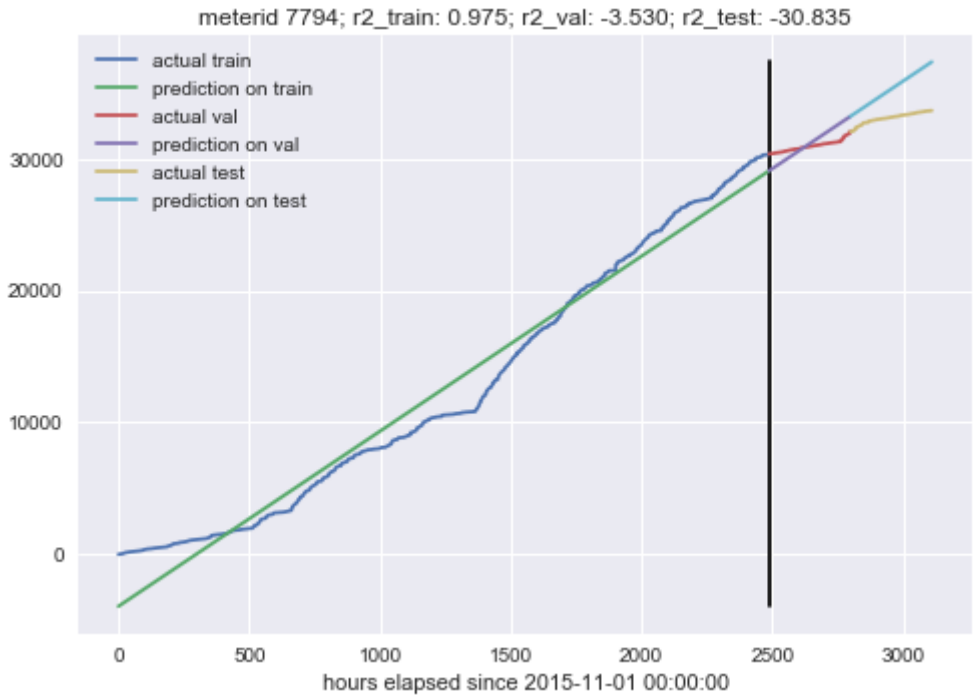
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500


meterid 7794; r2_train: 0.975; r2_val: -3.530; r2_test: -30.835
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
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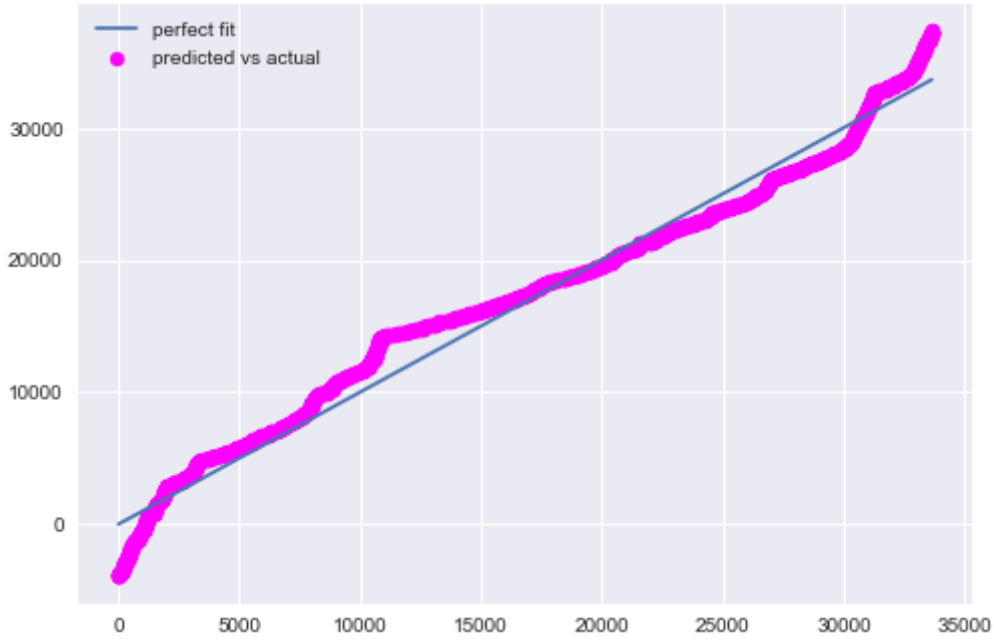
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
30000
20000
10000
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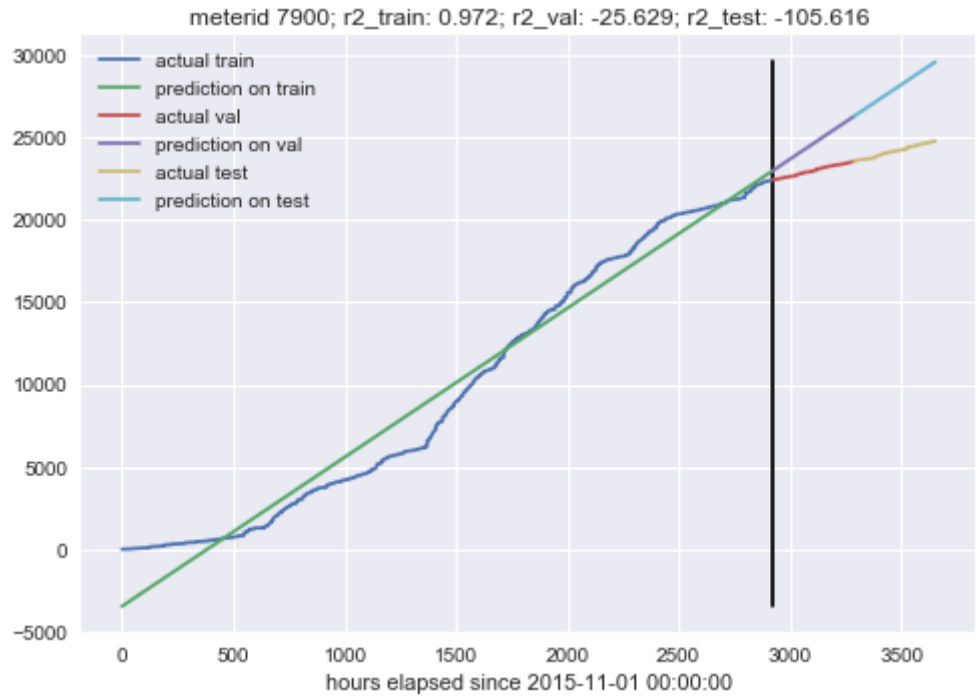
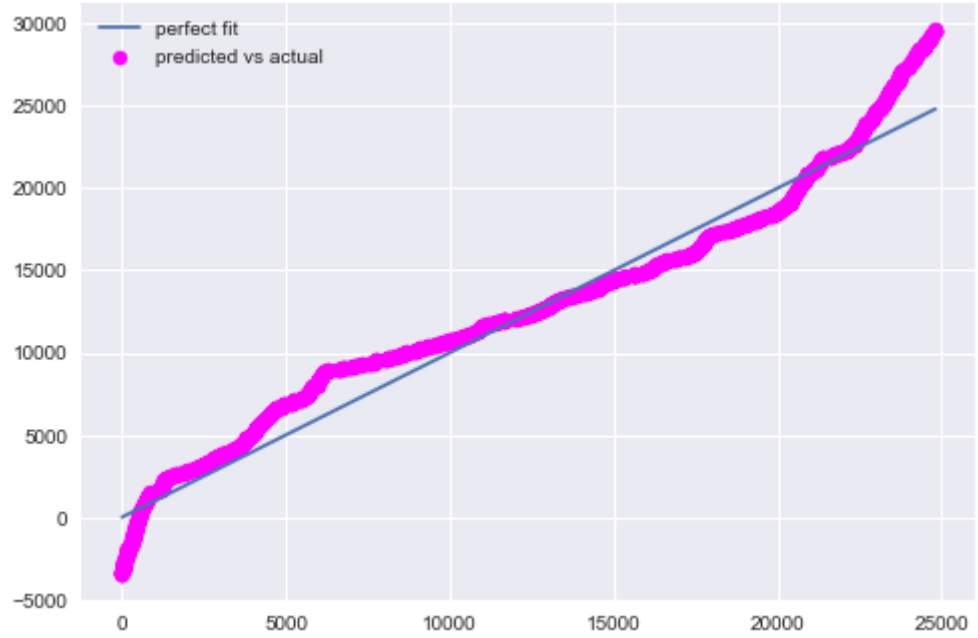
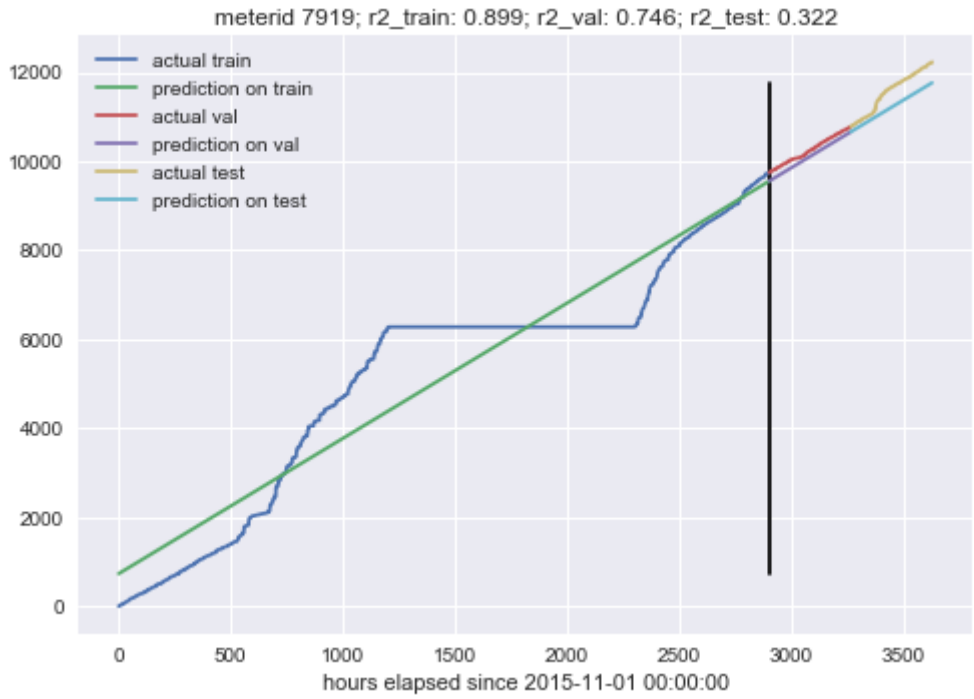
0
5000
10000
15000
20000
25000
30000
35000


meterid 7900; r2_train: 0.972; r2_val: -25.629; r2_test: -105.616
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000


meterid 7919; r2_train: 0.899; r2_val: 0.746; r2_test: 0.322
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
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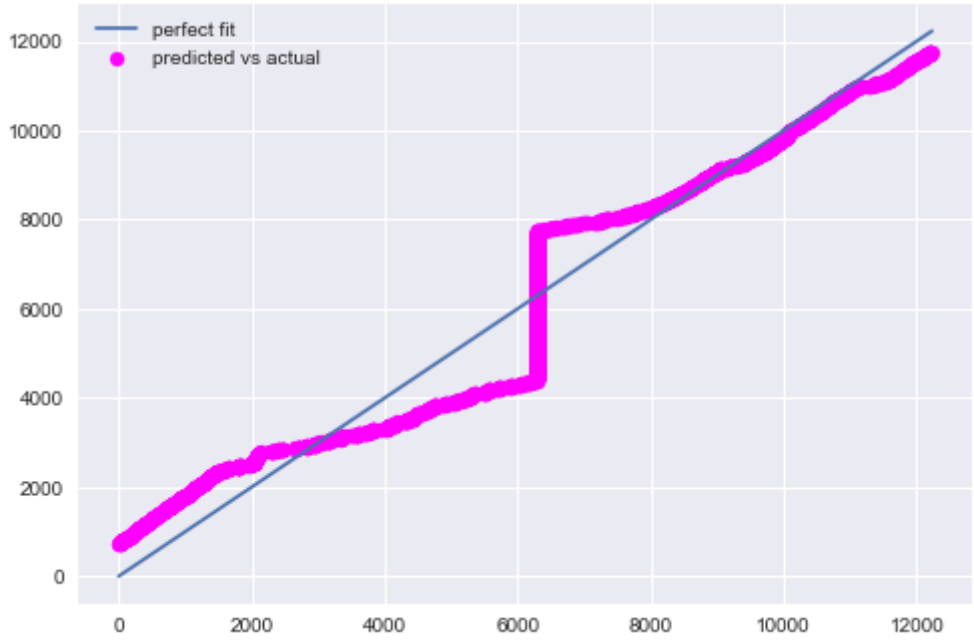
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
12000
10000
8000
6000
4000
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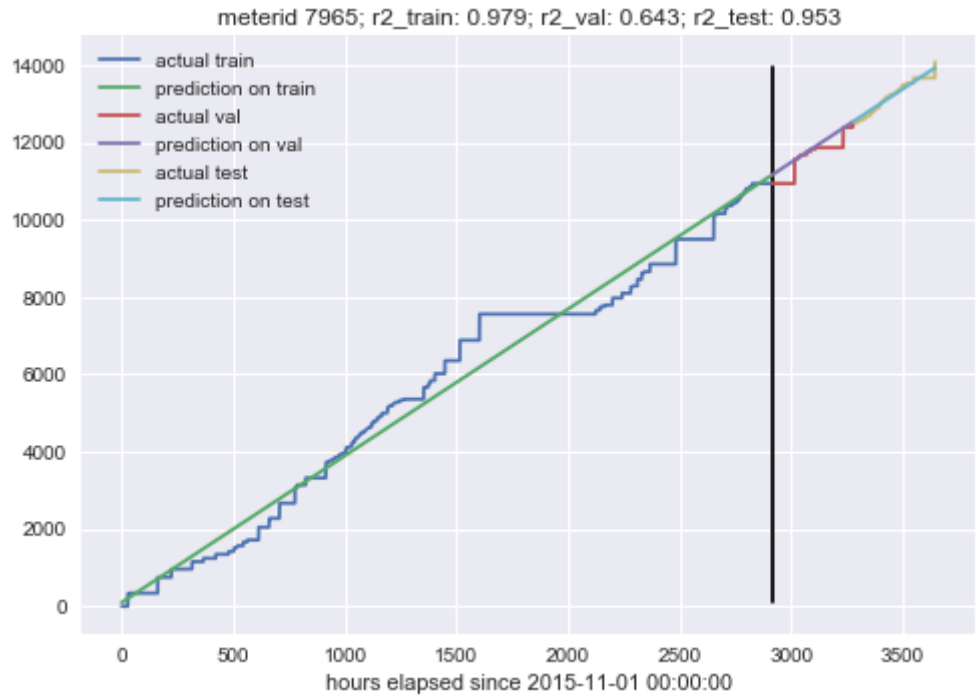
0
0
2000
4000
6000
8000
10000
12000


meterid 7965; r2_train: 0.979; r2_val: 0.643; r2_test: 0.953
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
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4000
2000
0
0
500
1000
1500
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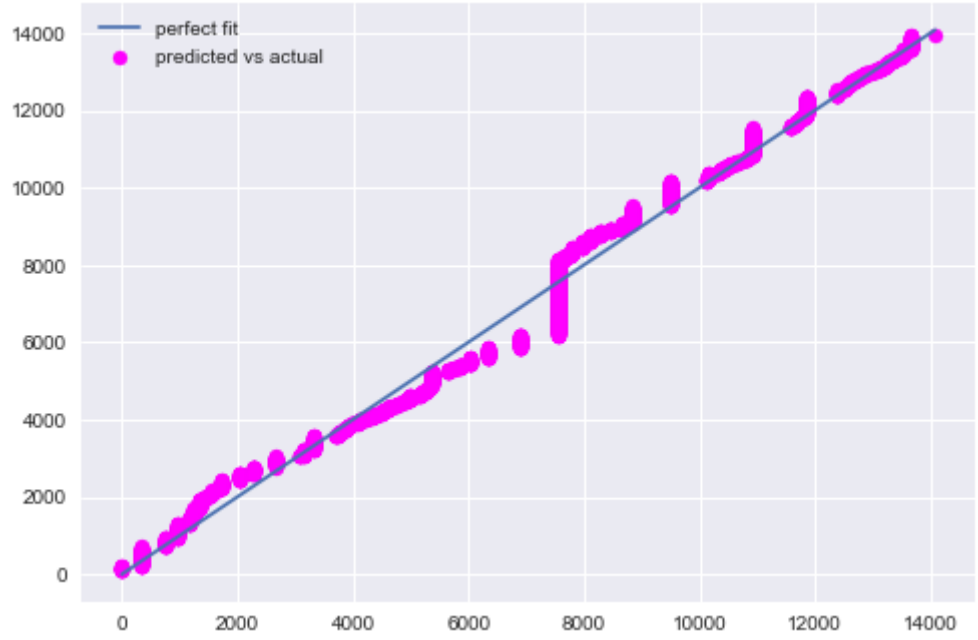
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
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0
2000
4000
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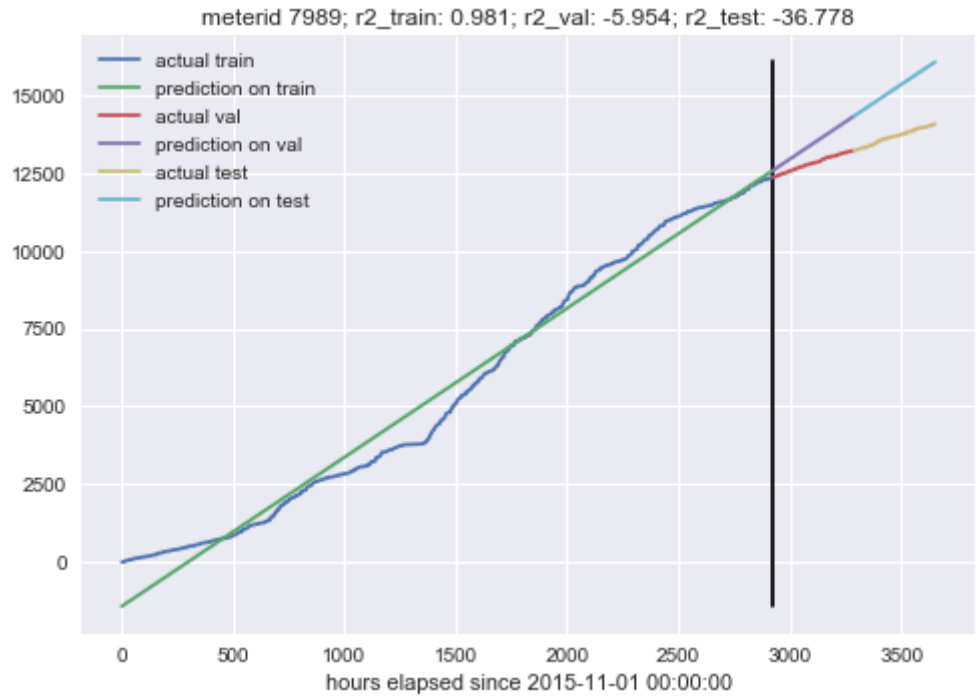
8000
10000
12000
14000


meterid 7989; r2_train: 0.981; r2_val: -5.954; r2_test: -36.778
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
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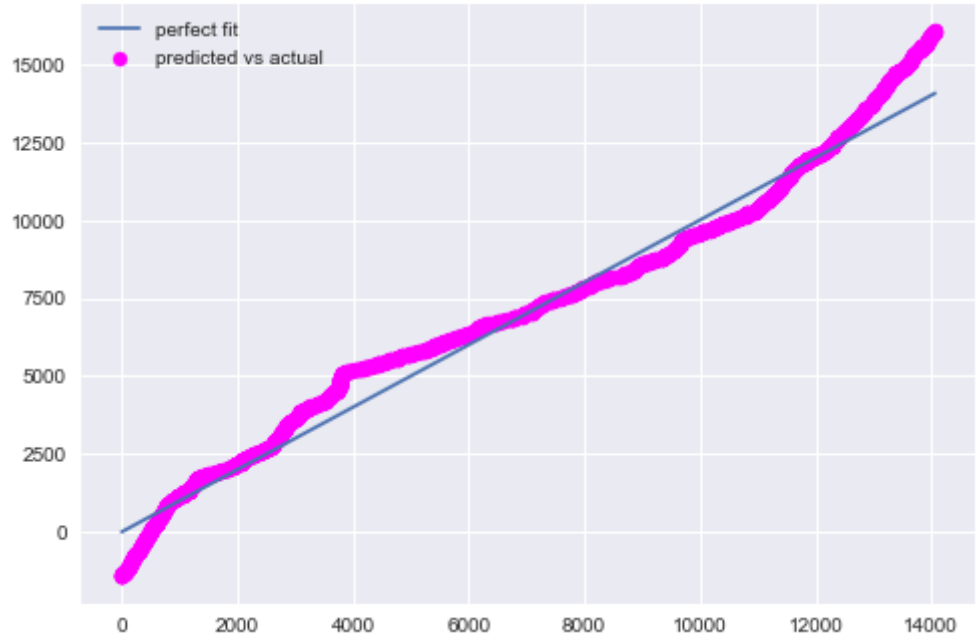
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
15000
12500
10000
7500
5000
2500
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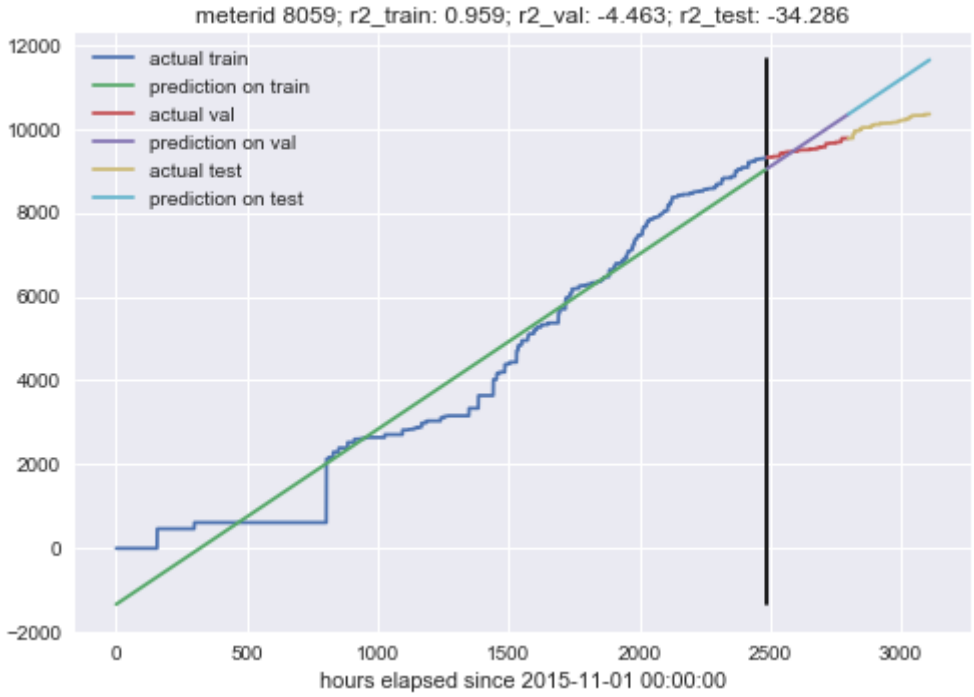
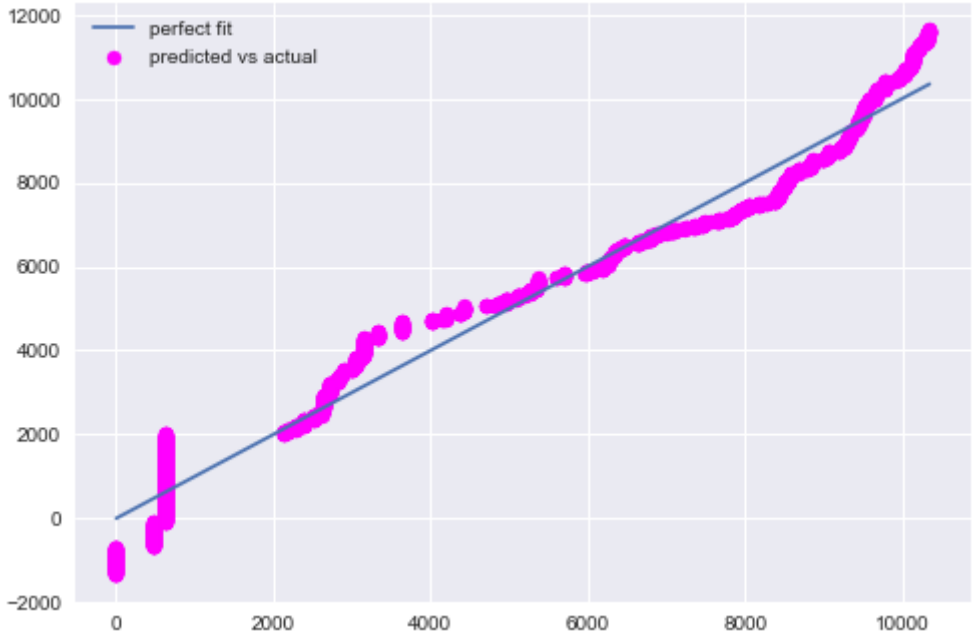
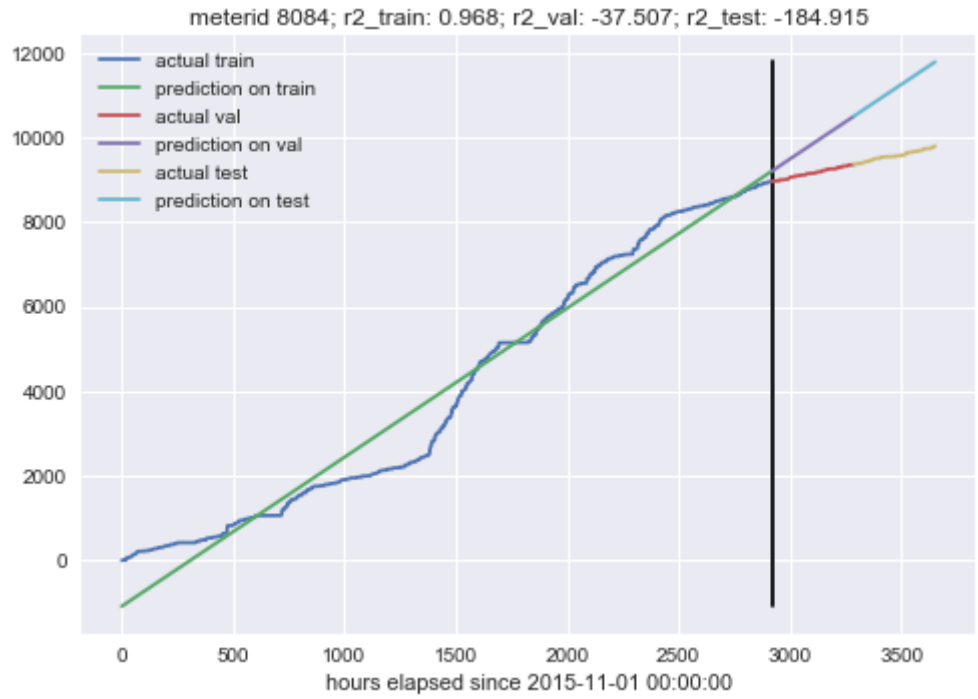
2000
4000
6000
8000
10000
12000
14000


meterid 8059; r2_train: 0.959; r2_val: -4.463; r2_test: -34.286
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
6000
4000
2000
0
−2000
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
−2000
0
2000
4000
6000
8000
10000


meterid 8084; r2_train: 0.968; r2_val: -37.507; r2_test: -184.915
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
12000
10000
8000
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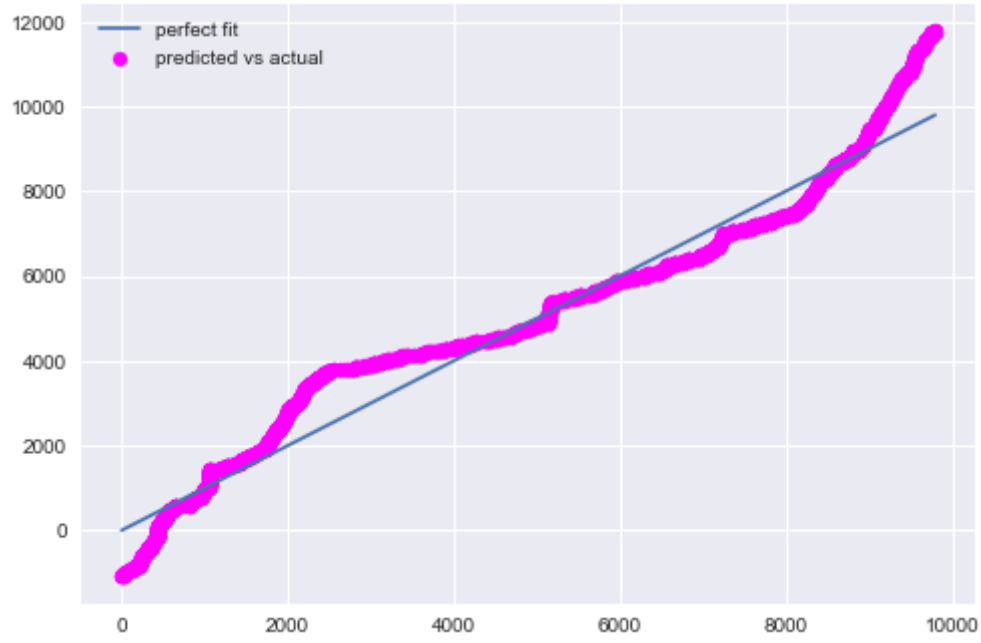
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
12000
10000
8000
6000
4000
2000
0
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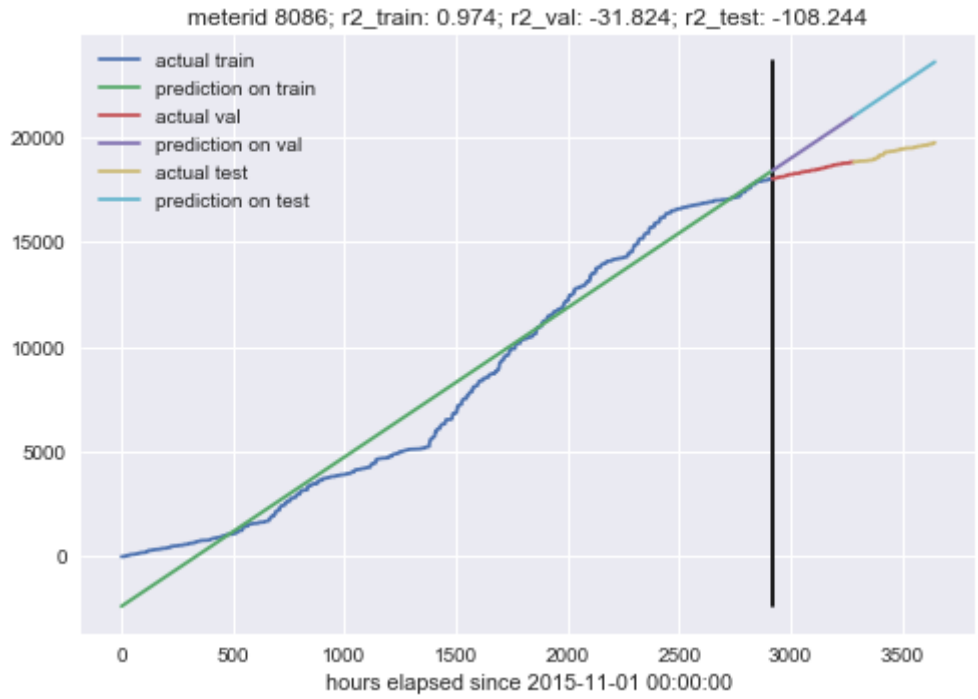
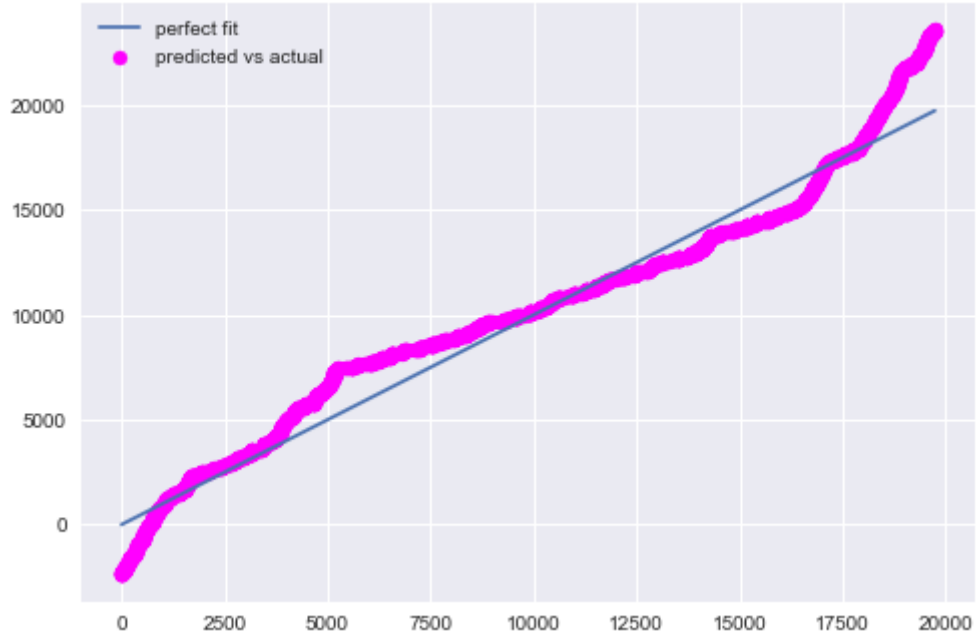
2000
4000
6000
8000
10000


meterid 8086; r2_train: 0.974; r2_val: -31.824; r2_test: -108.244
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
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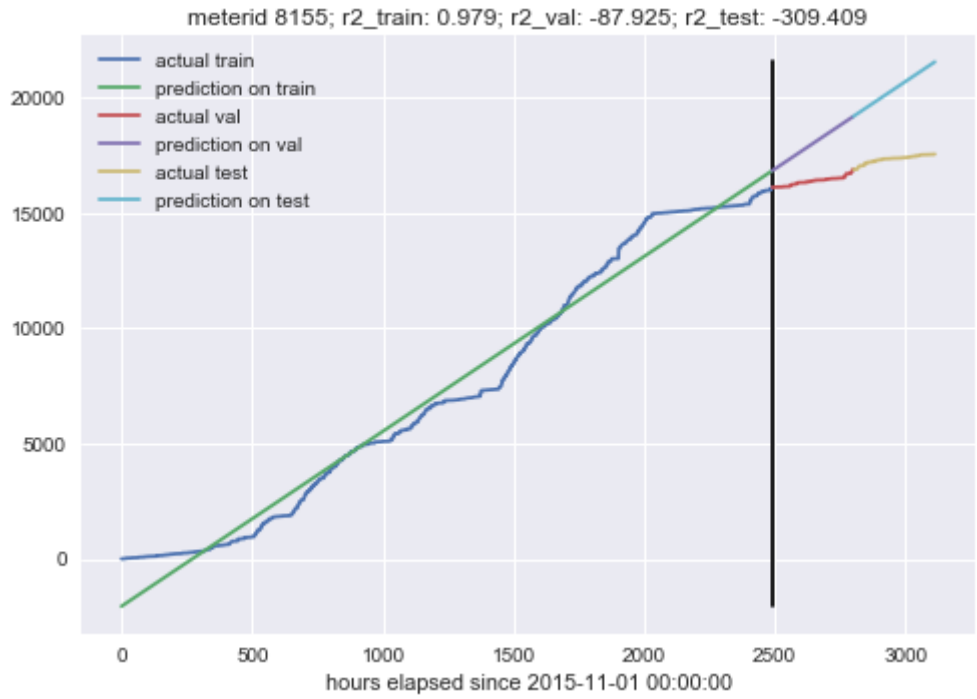
5000
7500
10000
12500
15000
17500
20000


meterid 8155; r2_train: 0.979; r2_val: -87.925; r2_test: -309.409
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
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15000
10000
5000
0
0
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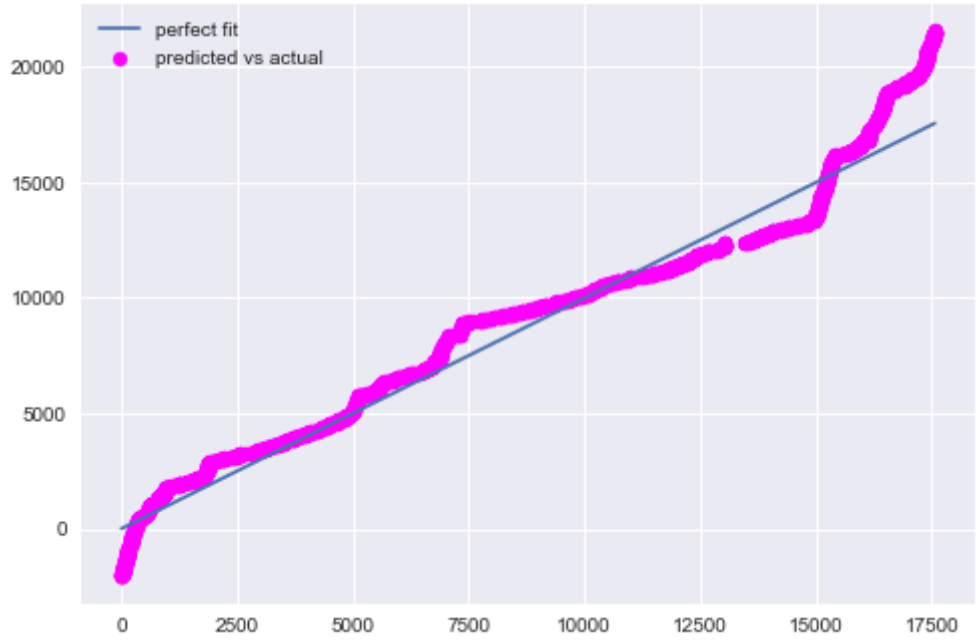
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
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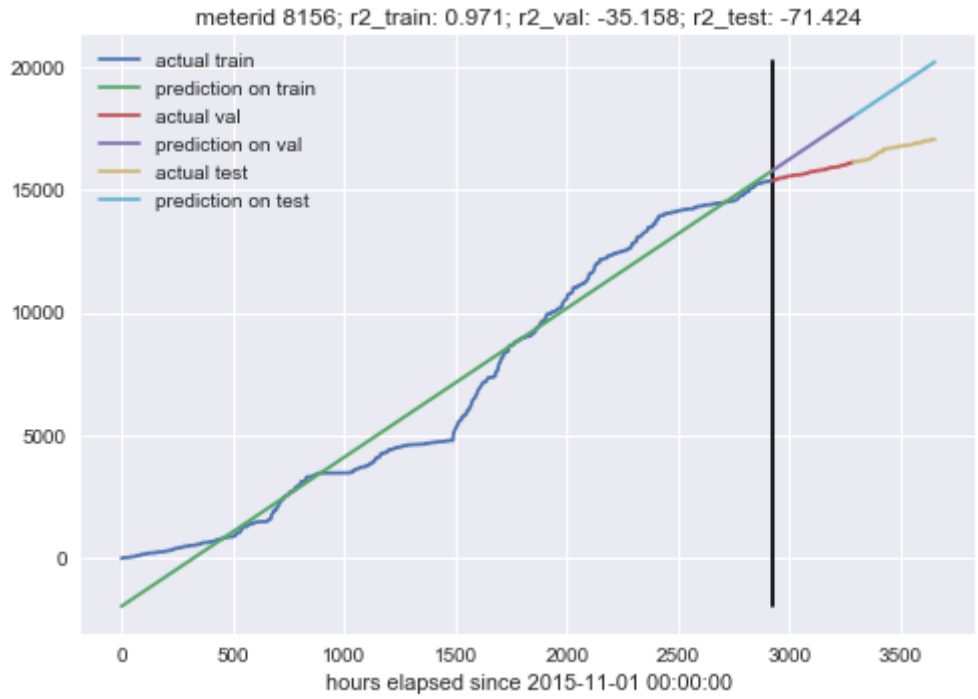
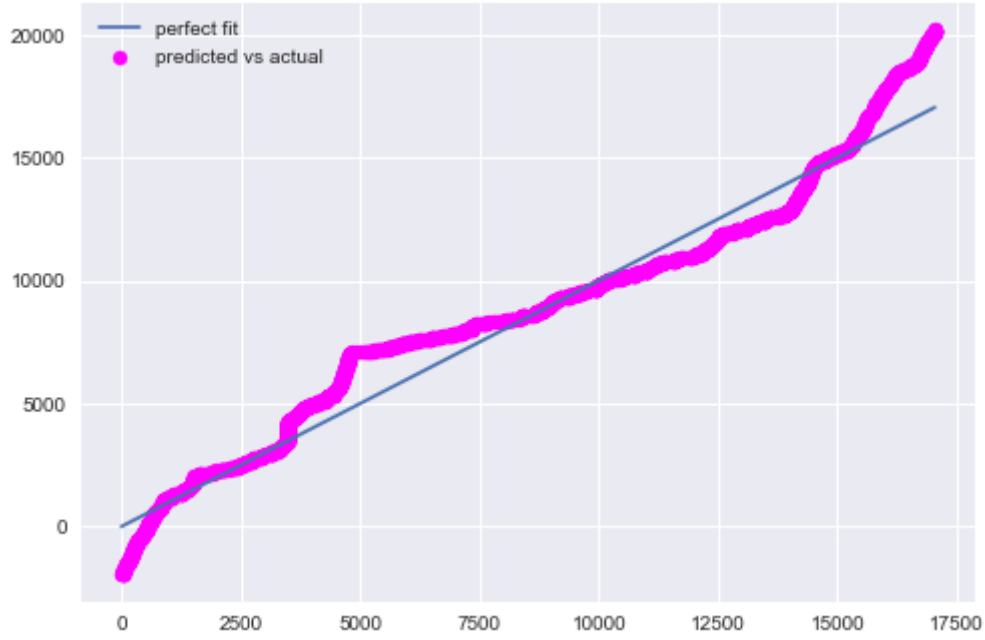
0
0
2500
5000
7500
10000
12500
15000
17500


meterid 8156; r2_train: 0.971; r2_val: -35.158; r2_test: -71.424
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
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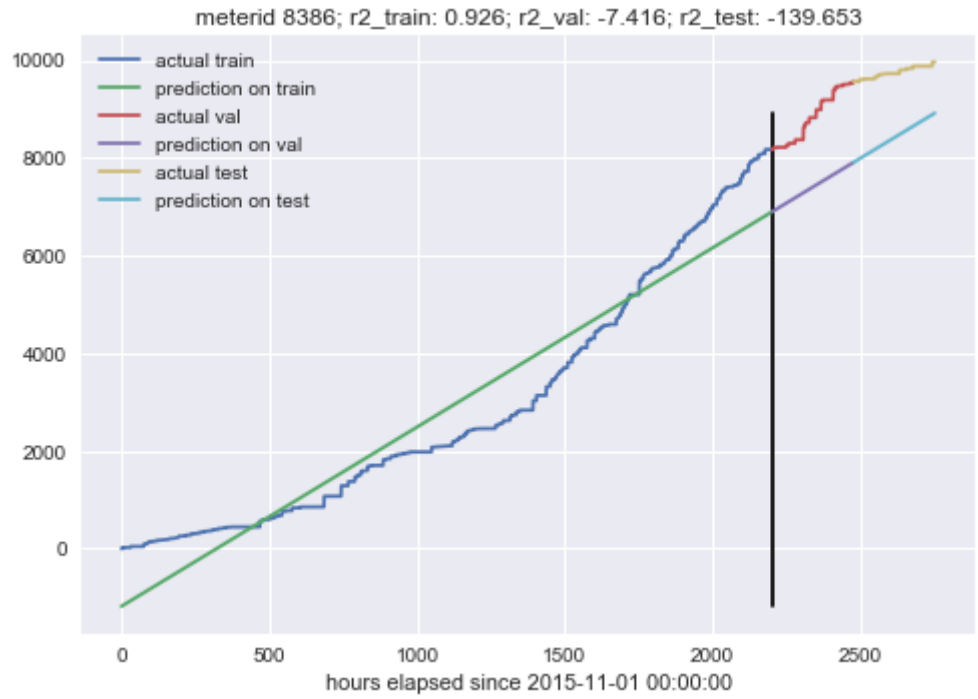
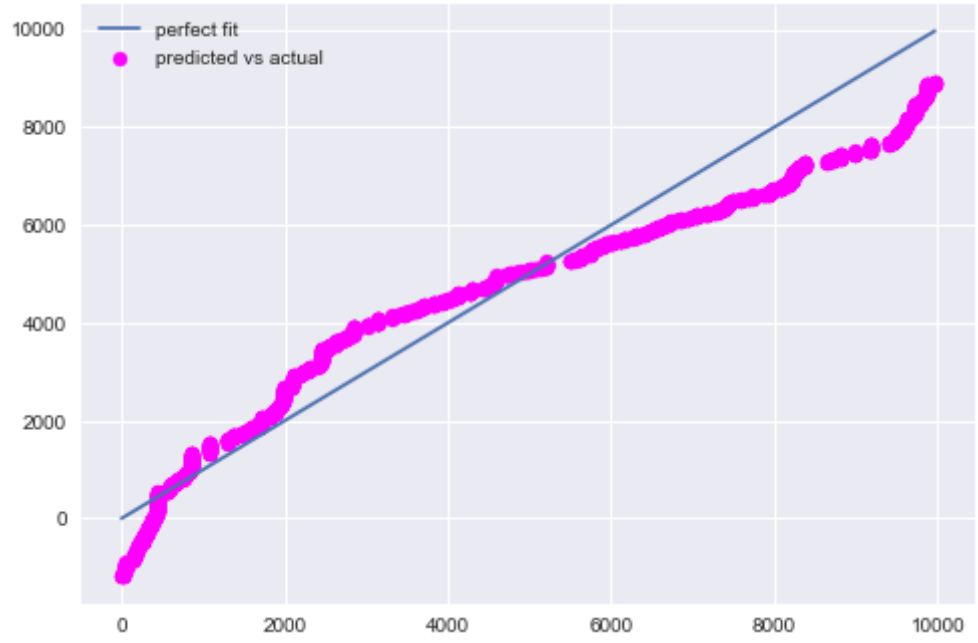
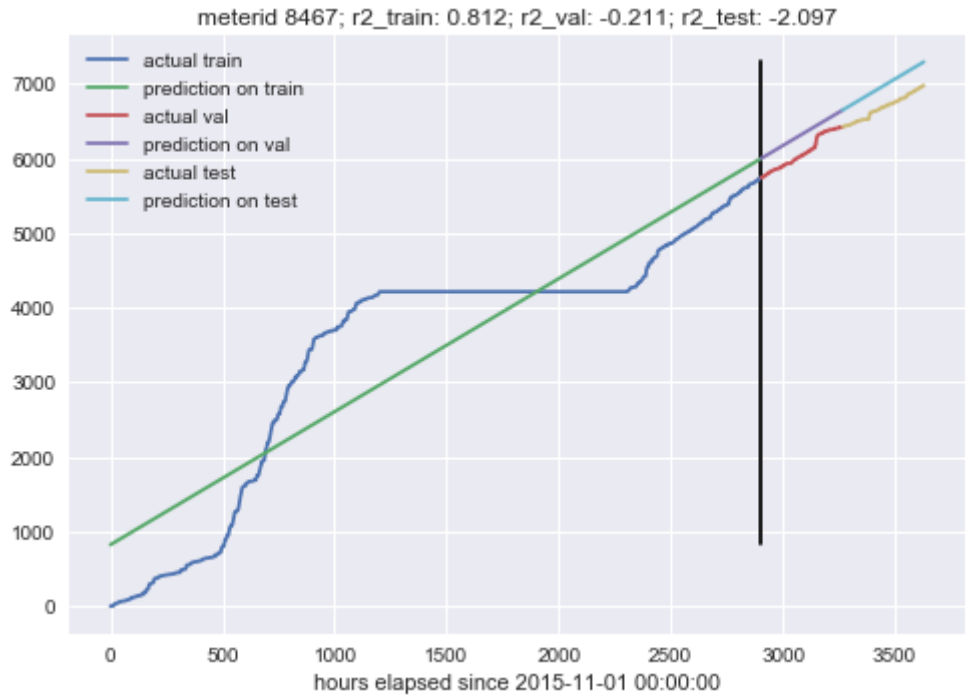
2500
5000
7500
10000
12500
15000
17500


meterid 8386; r2_train: 0.926; r2_val: -7.416; r2_test: -139.653
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000


meterid 8467; r2_train: 0.812; r2_val: -0.211; r2_test: -2.097
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
0
1000
2000
3000
4000
5000
6000
7000
0
500
1000
1500
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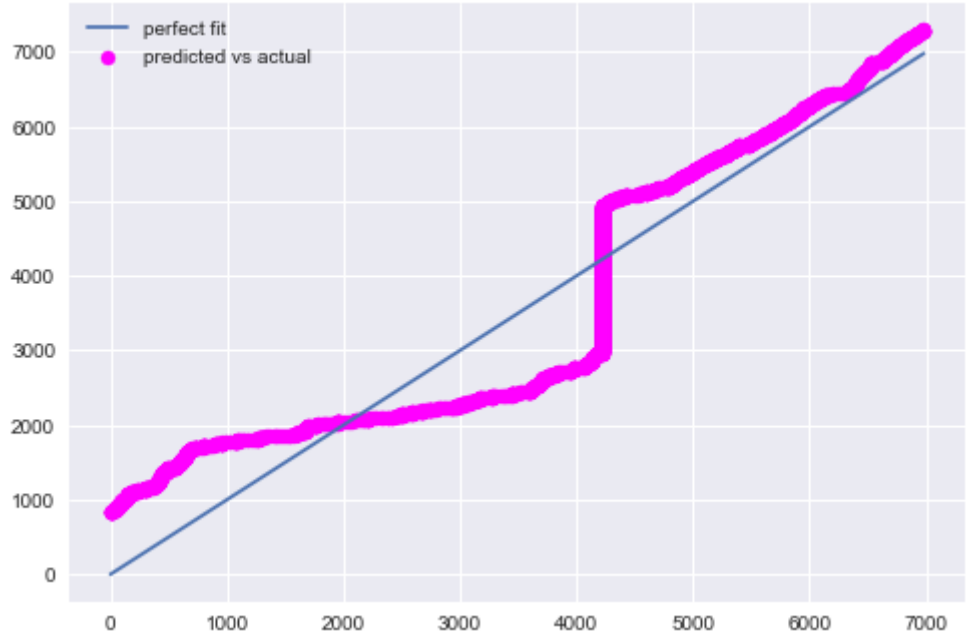
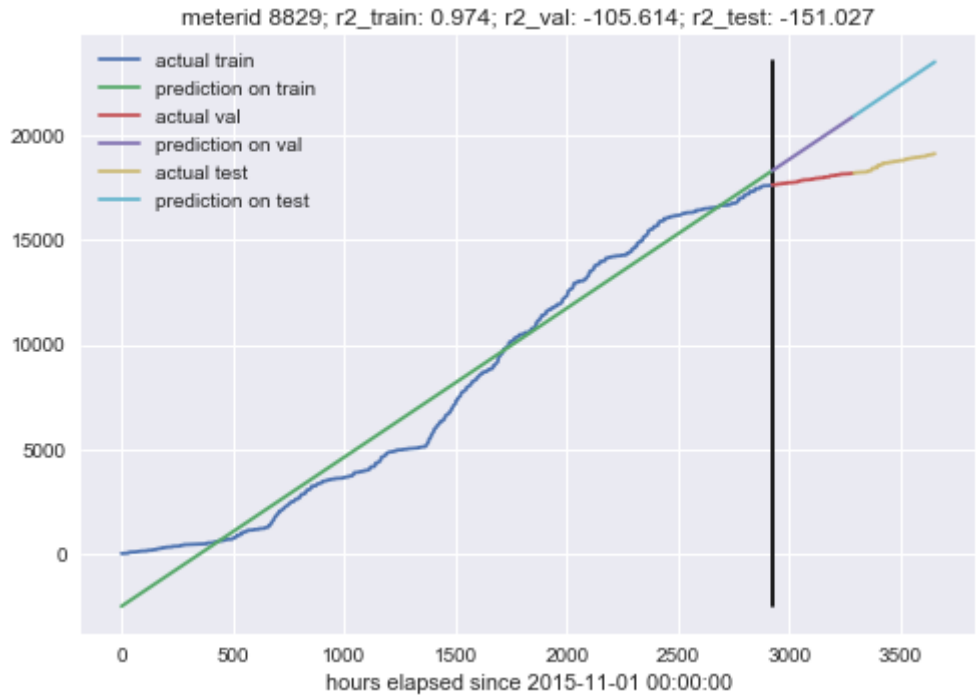
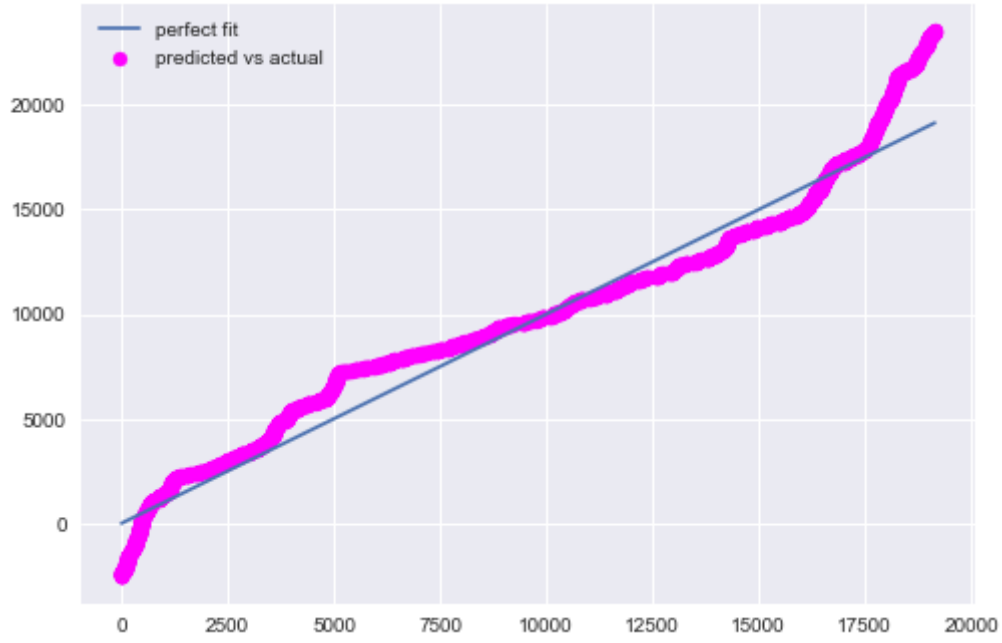
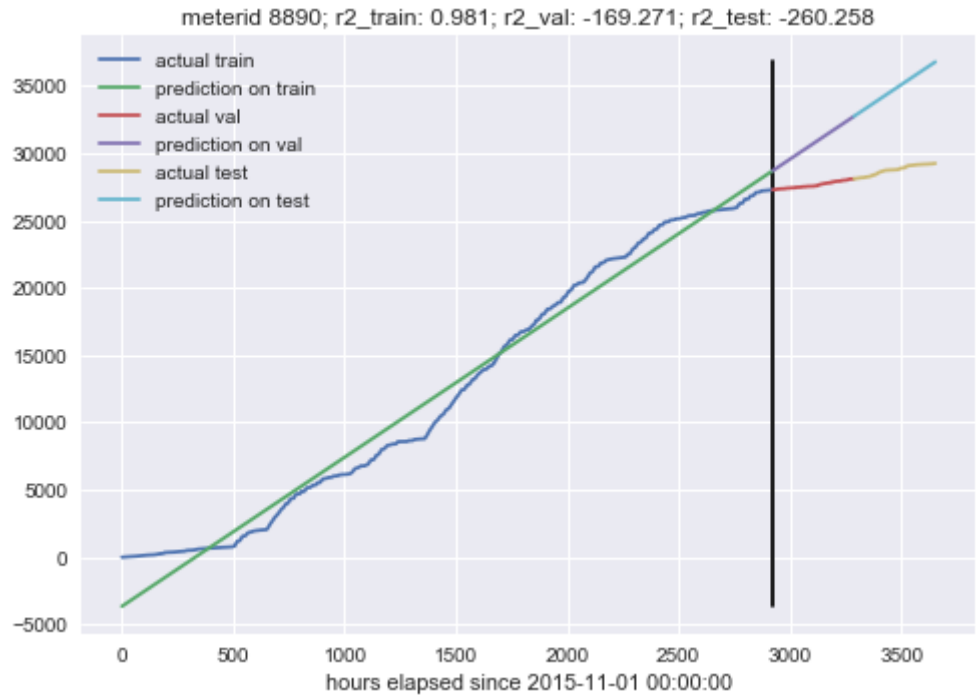
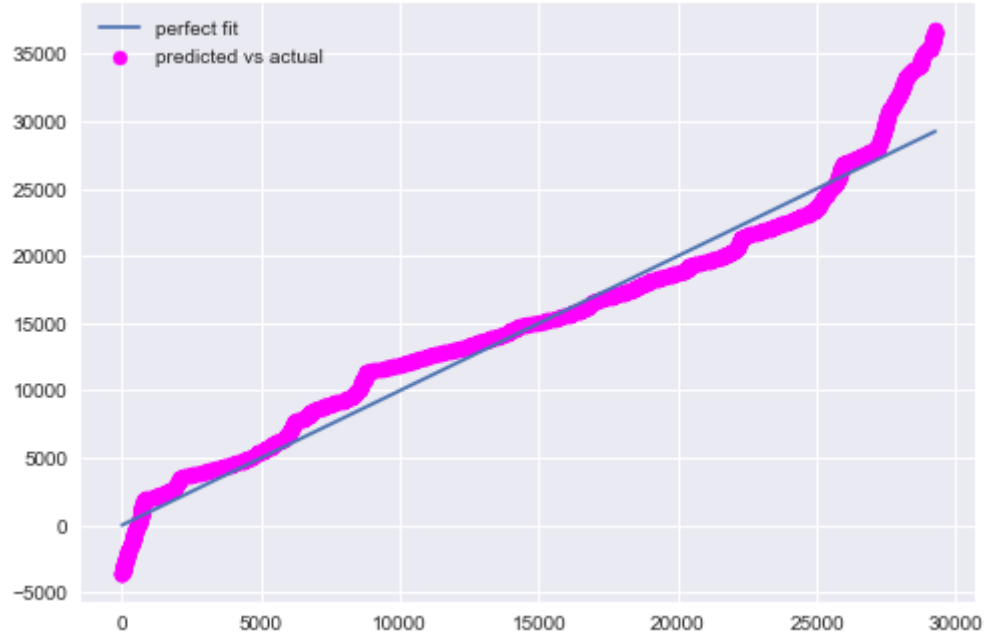
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

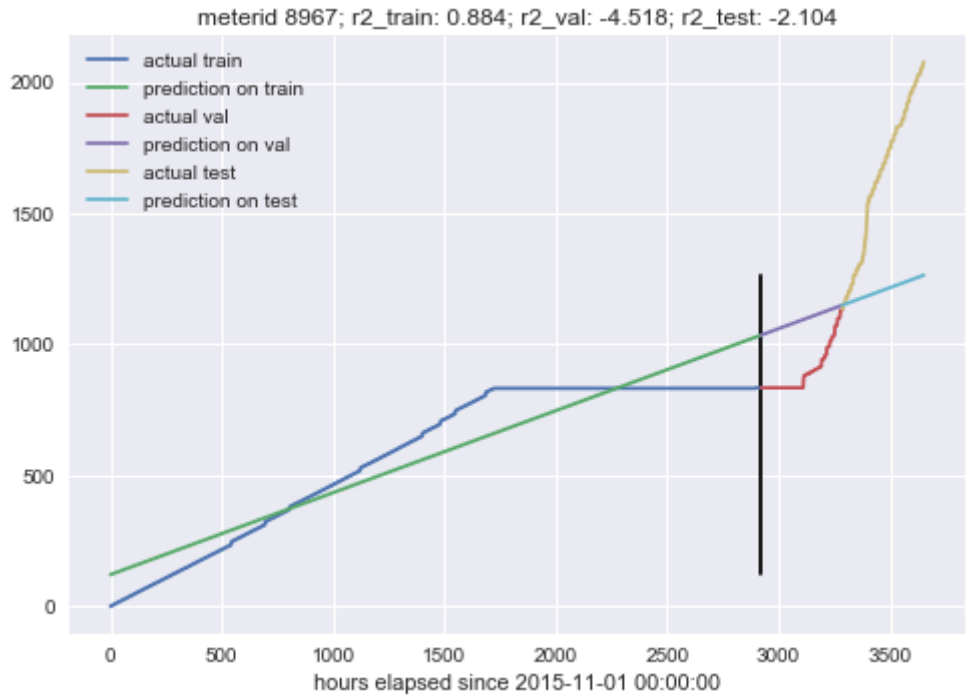

perfect fit
predicted vs actual
0
1000
2000
3000
4000
5000
6000
7000

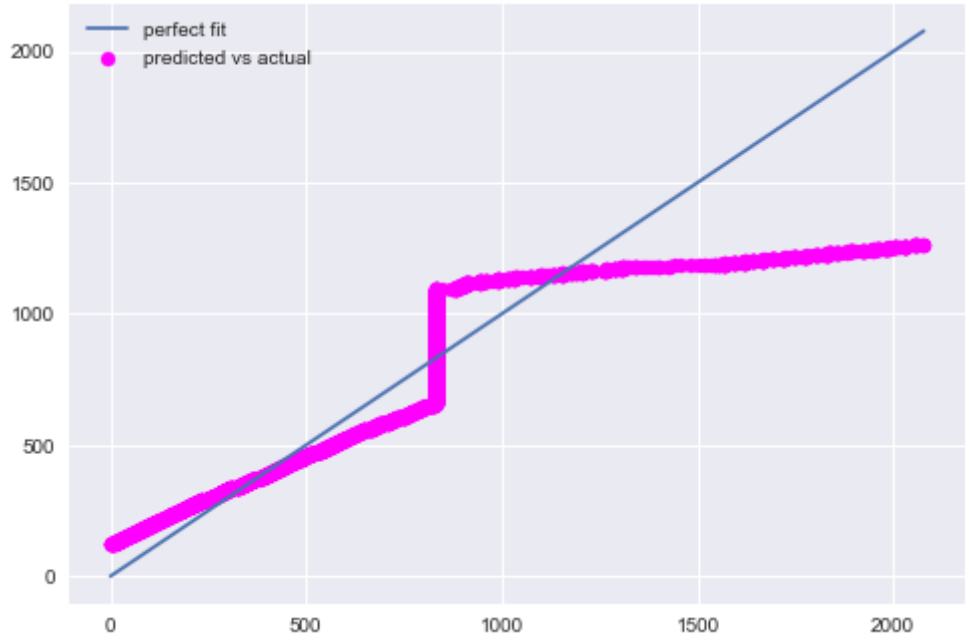

meterid 8829; r2_train: 0.974; r2_val: -105.614; r2_test: -151.027
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

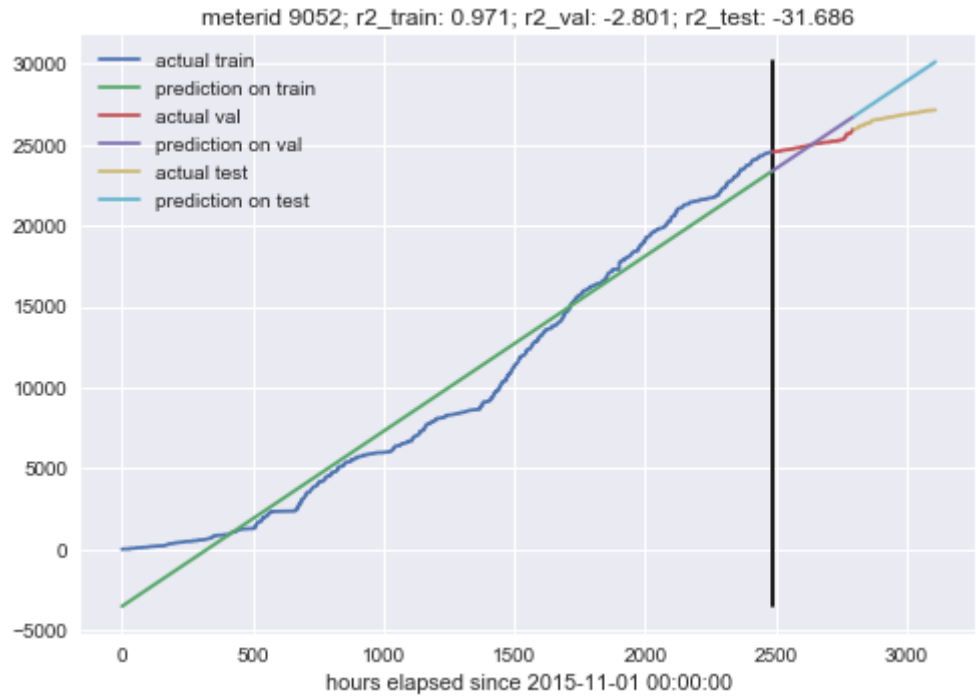

perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
20000

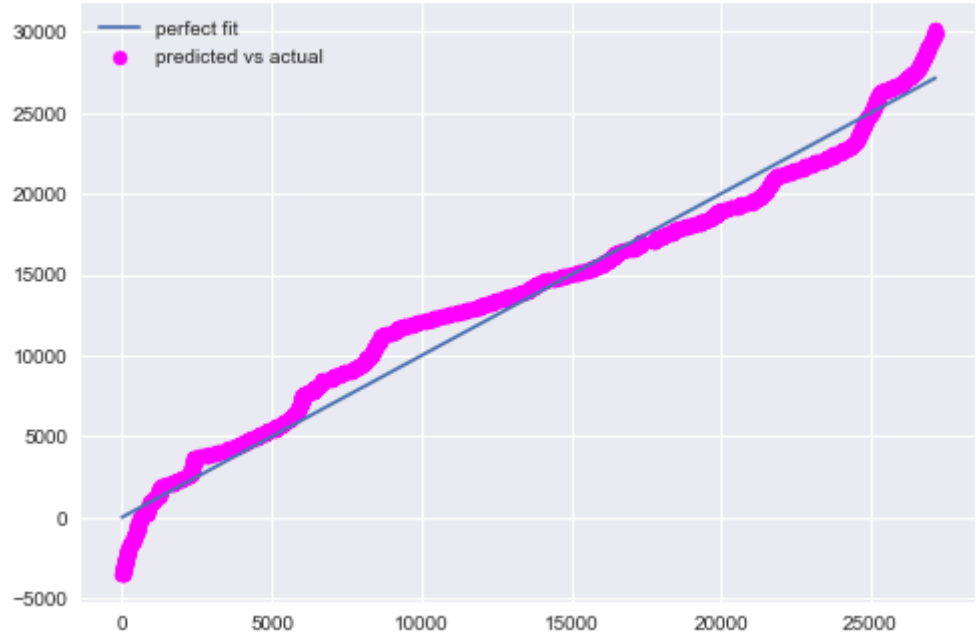

meterid 8890; r2_train: 0.981; r2_val: -169.271; r2_test: -260.258
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

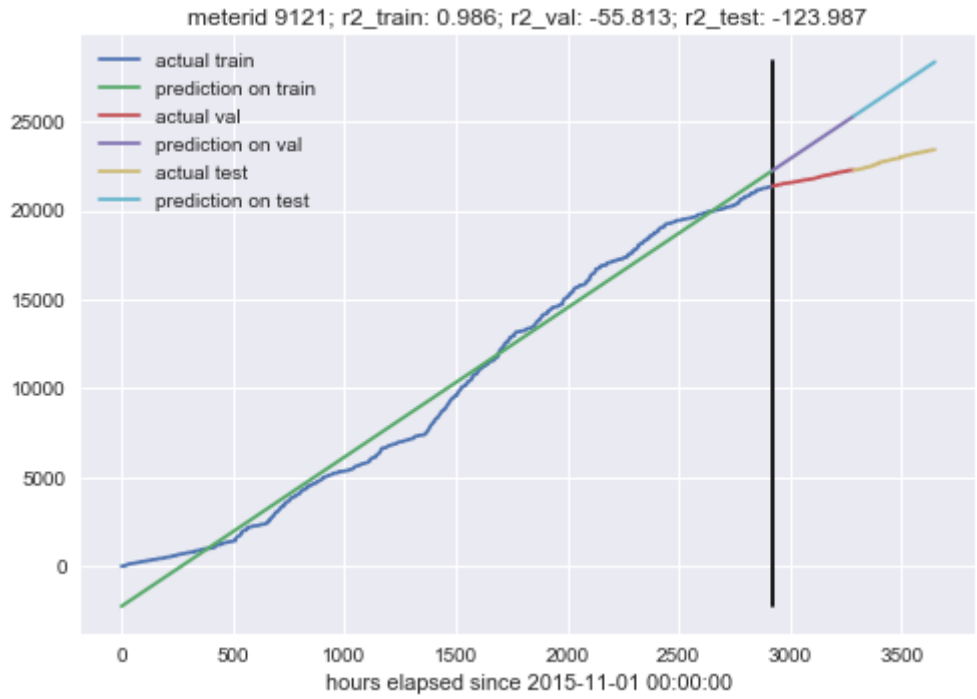

perfect fit
predicted vs actual
35000
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000
30000

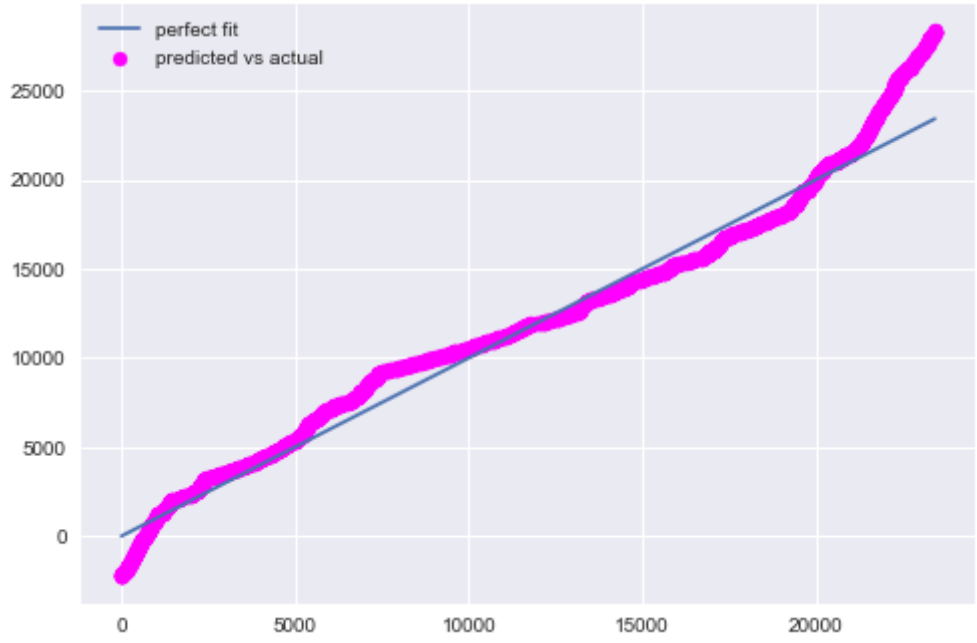

meterid 8967; r2_train: 0.884; r2_val: -4.518; r2_test: -2.104
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
2000
1500
1000
500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

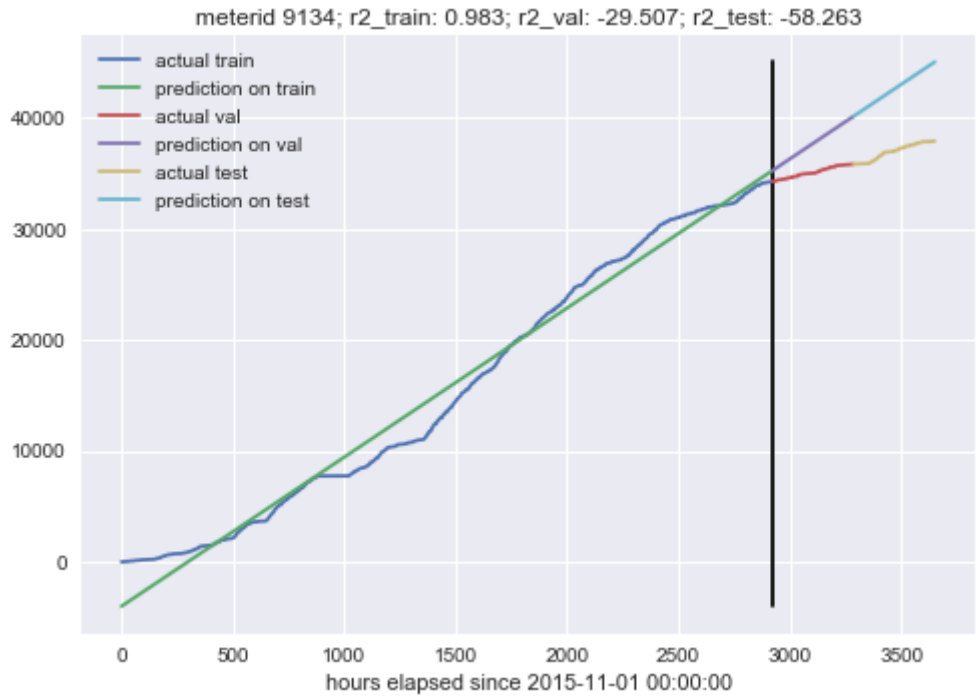

perfect fit
predicted vs actual
2000
1500
1000
500
0
0
500
1000
1500
2000

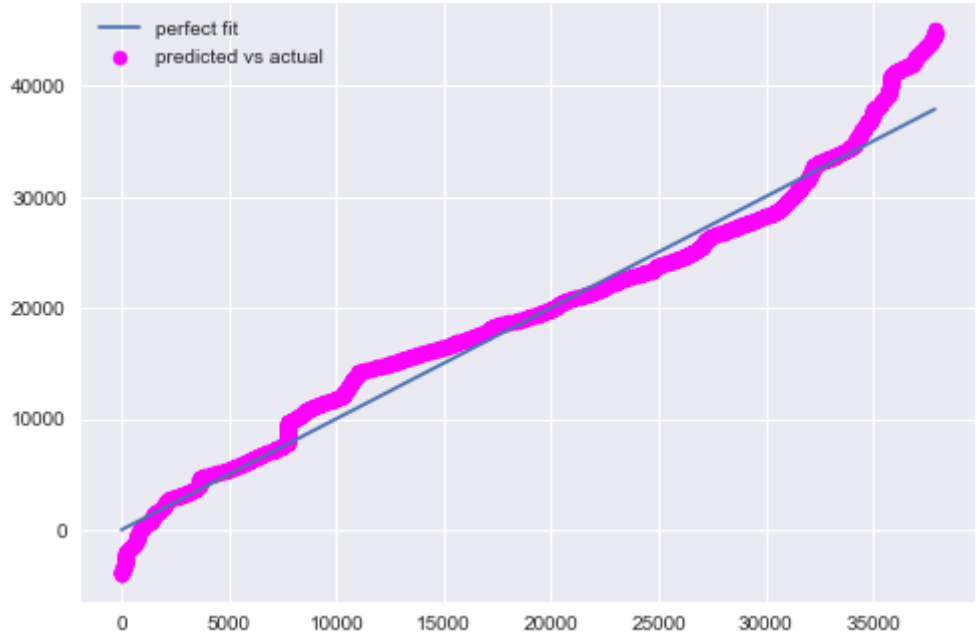

meterid 9052; r2_train: 0.971; r2_val: -2.801; r2_test: -31.686
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
−5000
0
500
1000
1500
2000
2500
3000
hours elapsed since 2015-11-01 00:00:00

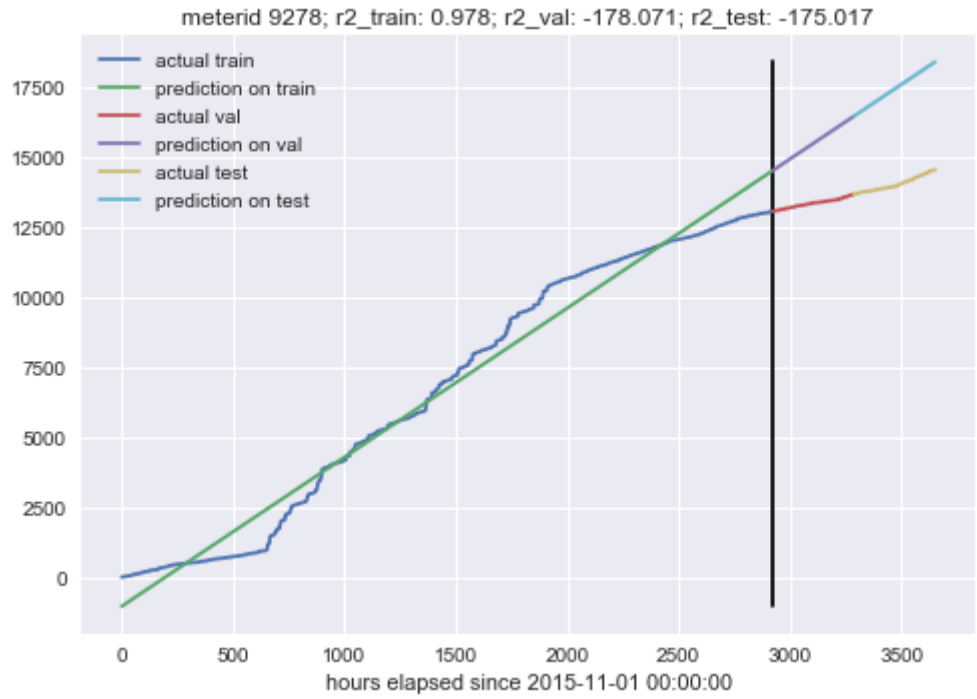

perfect fit
predicted vs actual
30000
25000
20000
15000
10000
5000
0
−5000
0
5000
10000
15000
20000
25000

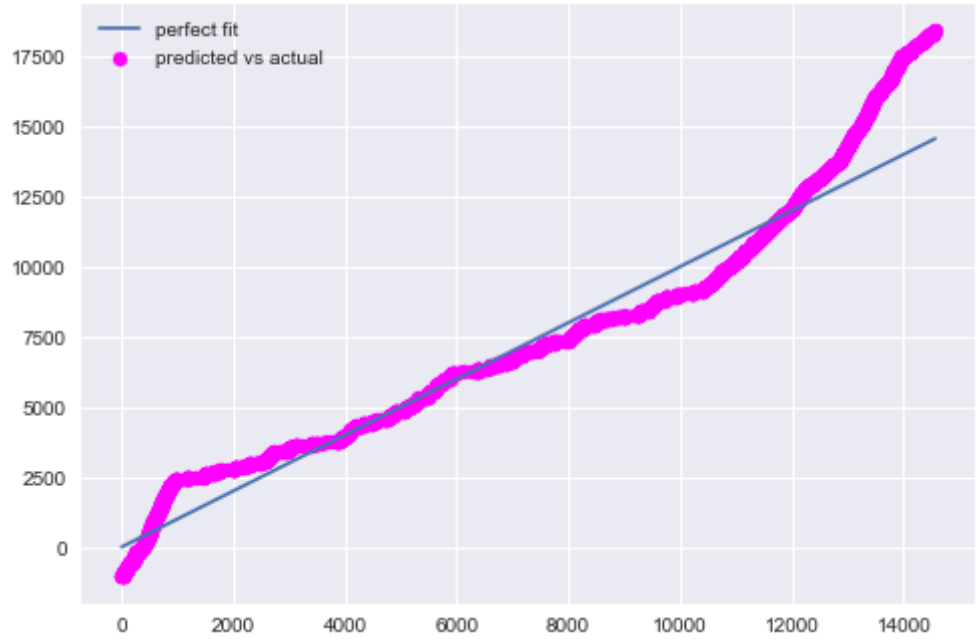

meterid 9121; r2_train: 0.986; r2_val: -55.813; r2_test: -123.987
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

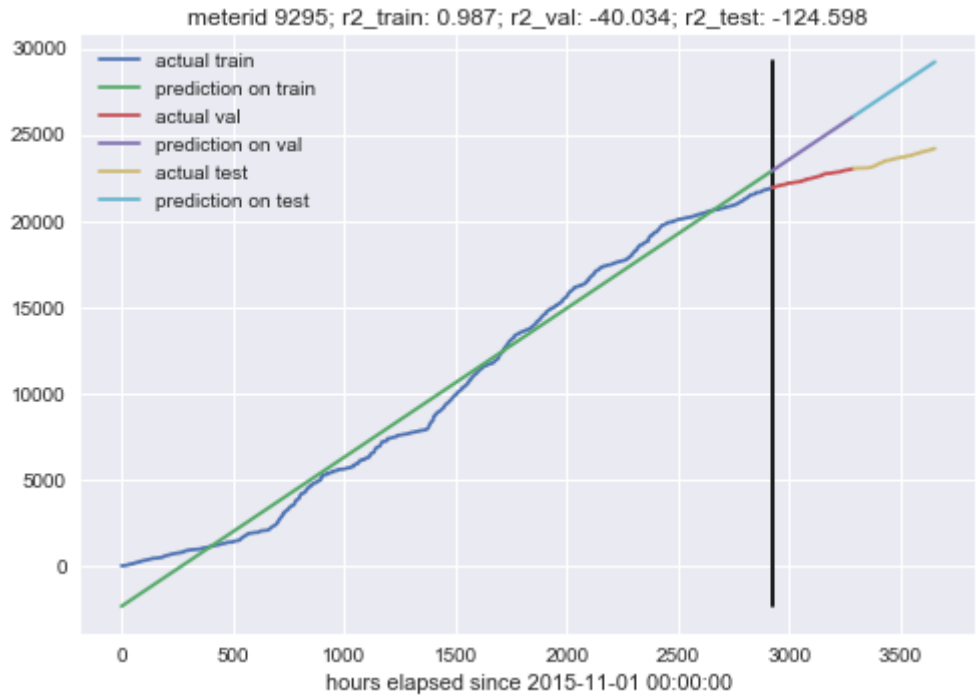

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
5000
10000
15000
20000

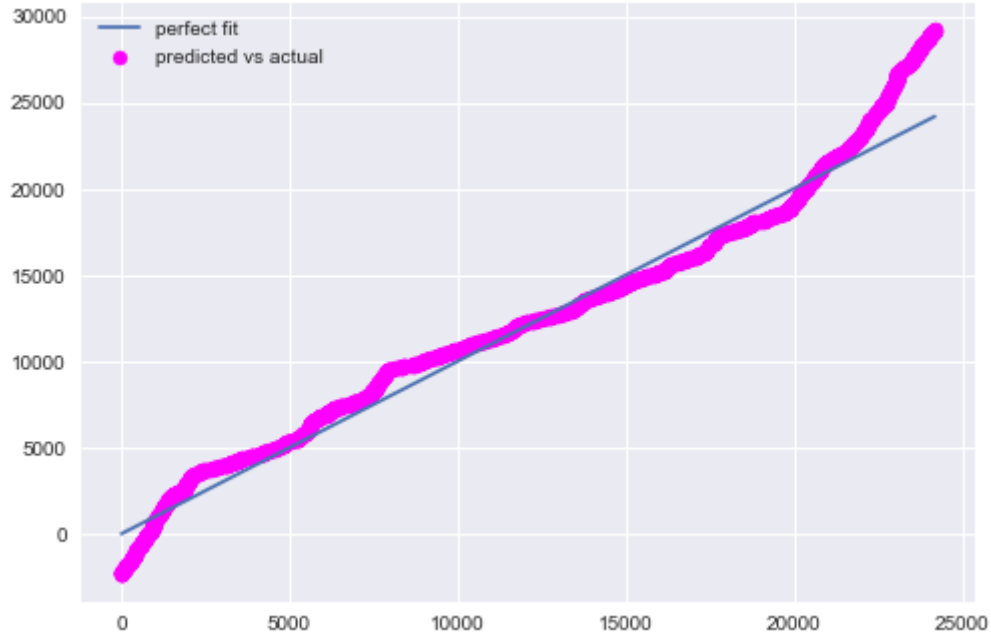

meterid 9134; r2_train: 0.983; r2_val: -29.507; r2_test: -58.263
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
40000
30000
20000
10000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
40000
30000
20000
10000
0
0
5000
10000
15000
20000
25000
30000
35000


meterid 9278; r2_train: 0.978; r2_val: -178.071; r2_test: -175.017
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
0
2000
4000
6000
8000
10000
12000
14000


meterid 9295; r2_train: 0.987; r2_val: -40.034; r2_test: -124.598
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
30000
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
30000
25000
20000
15000
10000
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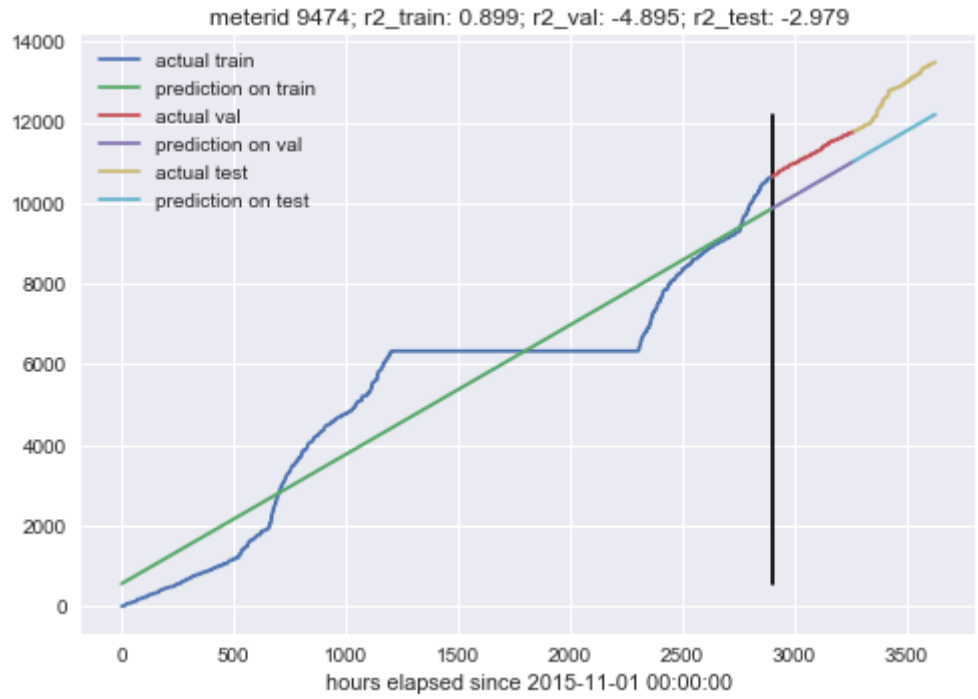
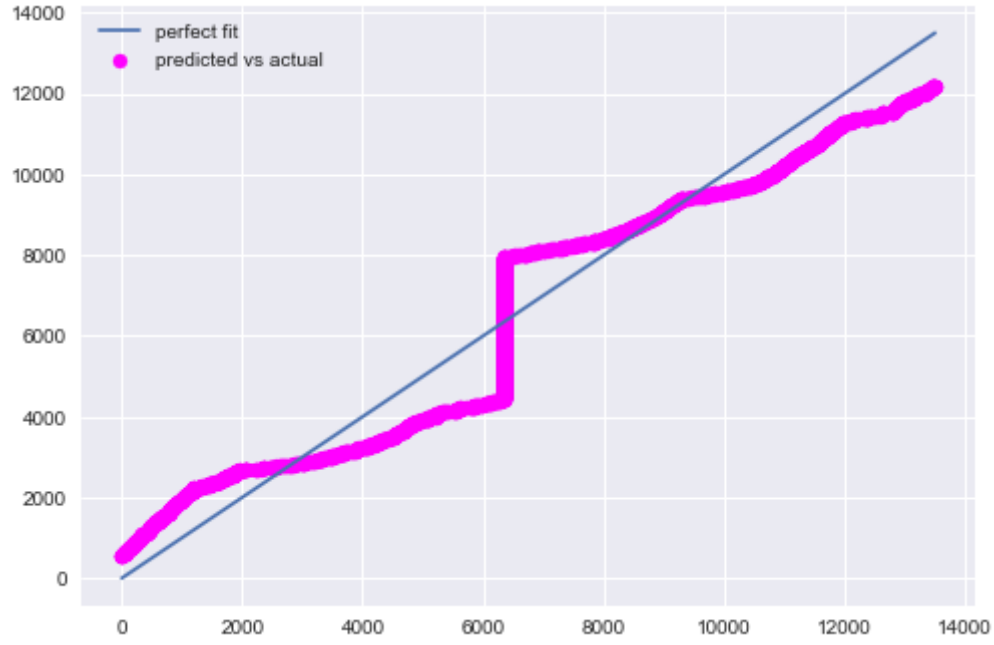
0
0
5000
10000
15000
20000
25000


meterid 9474; r2_train: 0.899; r2_val: -4.895; r2_test: -2.979
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
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0
2000
4000
6000
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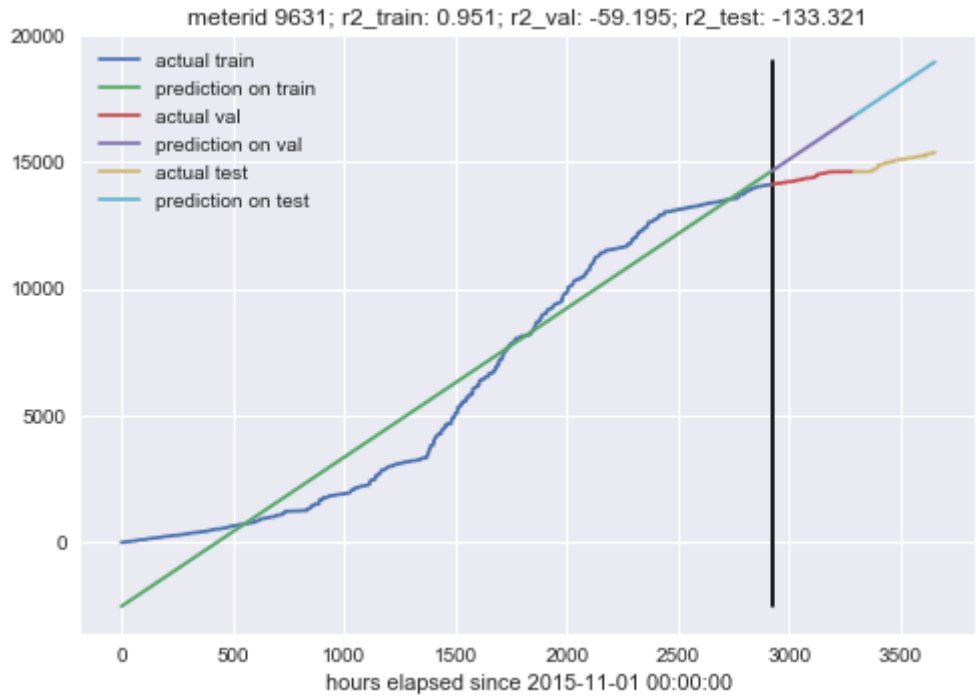
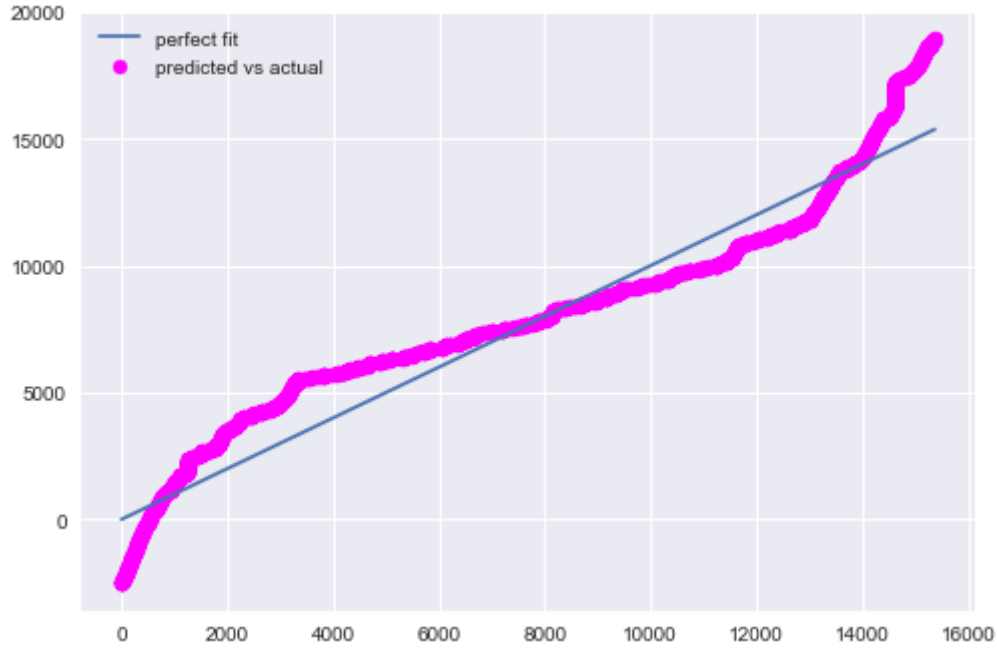
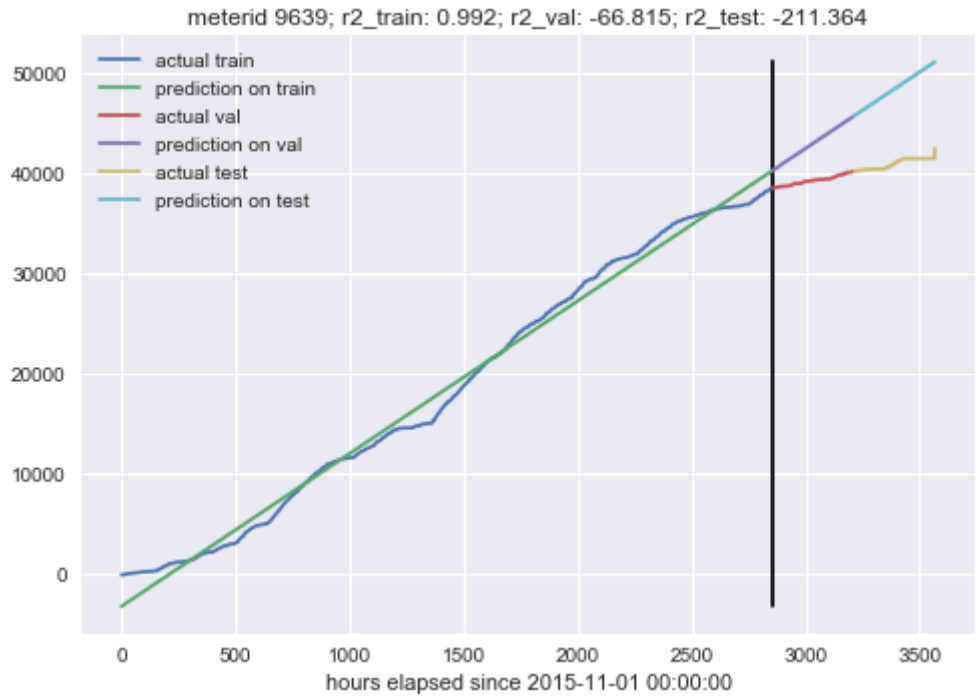
12000
14000


meterid 9631; r2_train: 0.951; r2_val: -59.195; r2_test: -133.321
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000
16000


meterid 9639; r2_train: 0.992; r2_val: -66.815; r2_test: -211.364
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
50000
40000
30000
20000
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0
500
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1500
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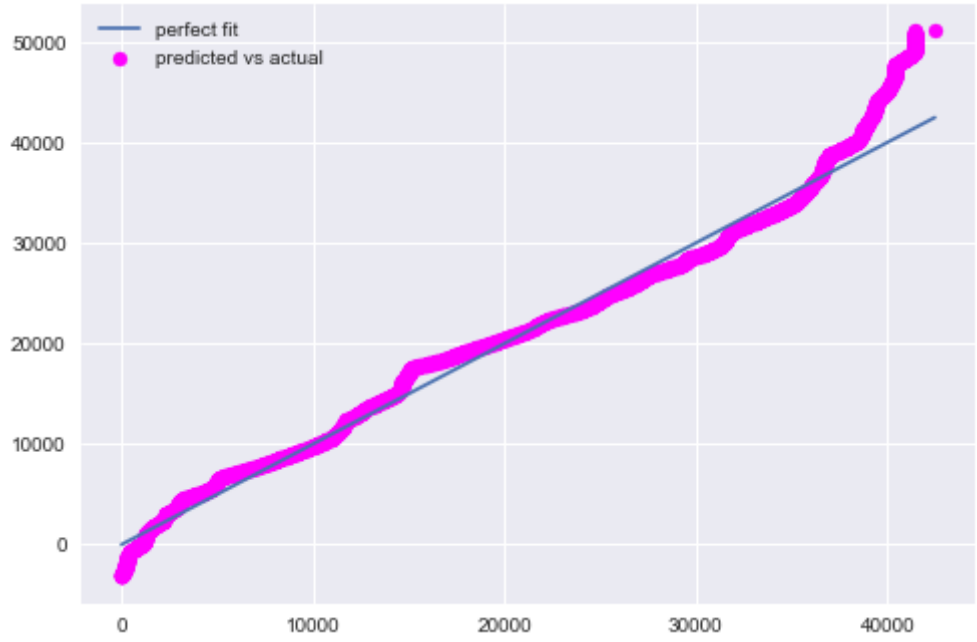
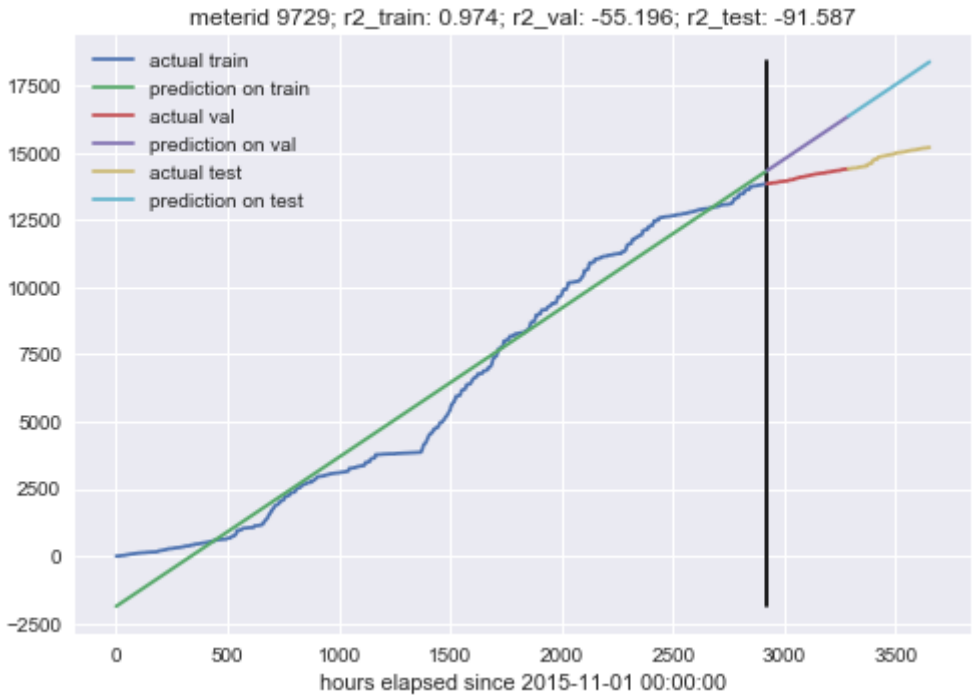
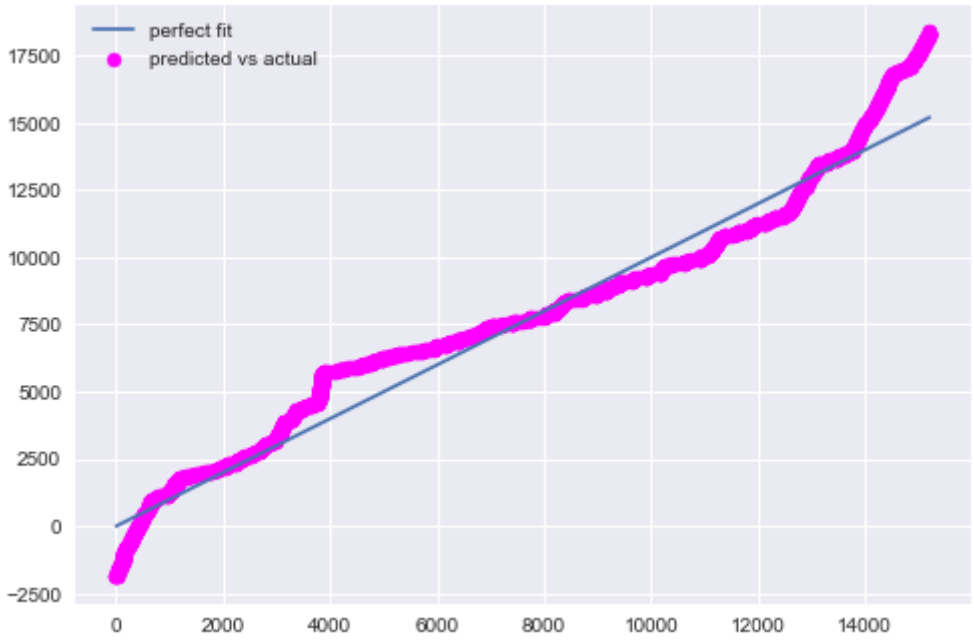
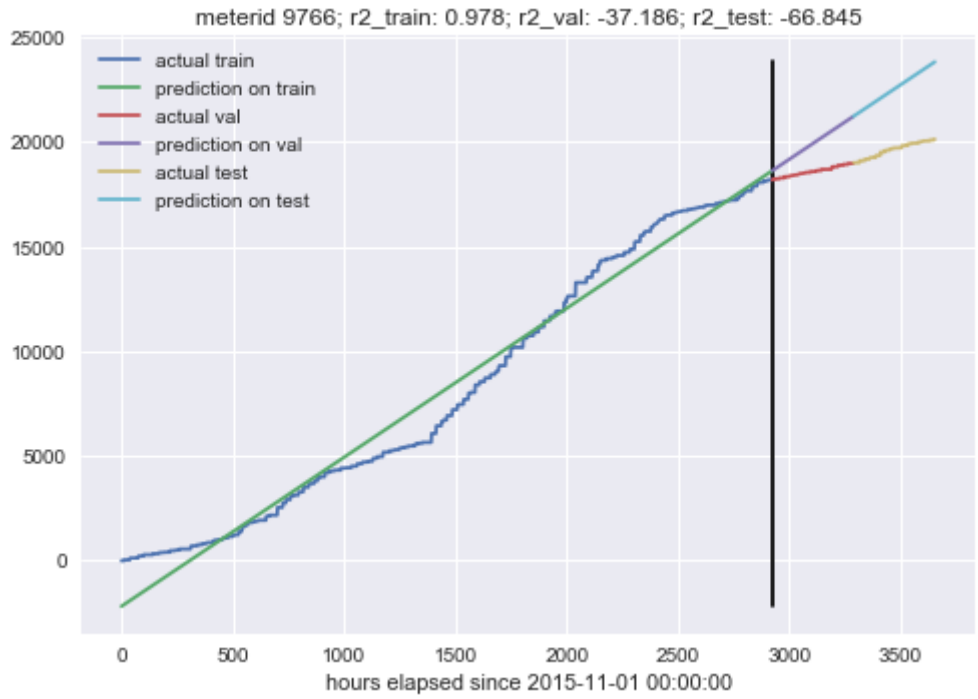
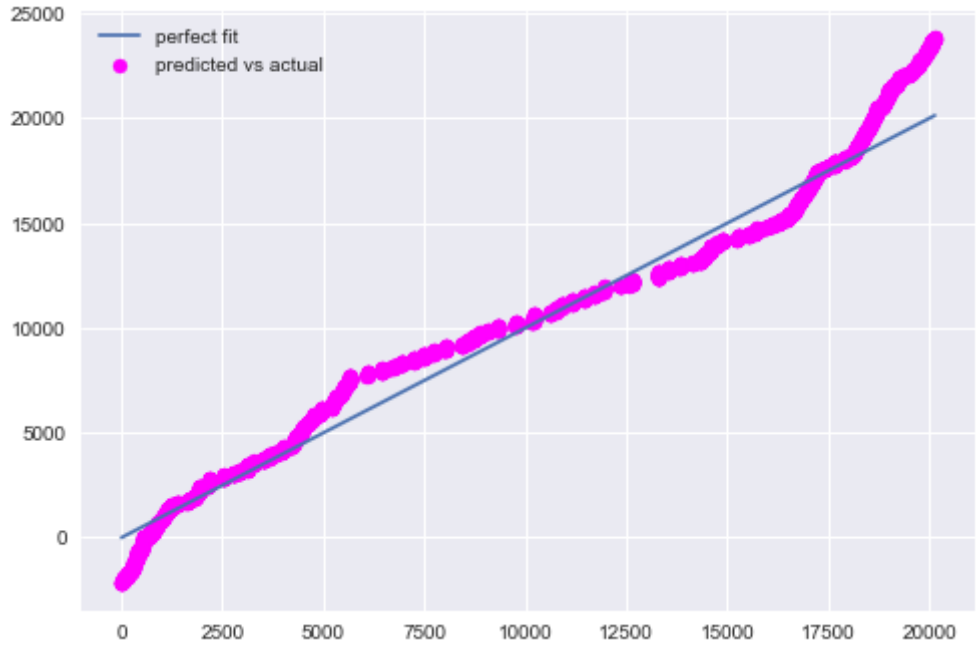
3000
3500
hours elapsed since 2015-11-01 00:00:00

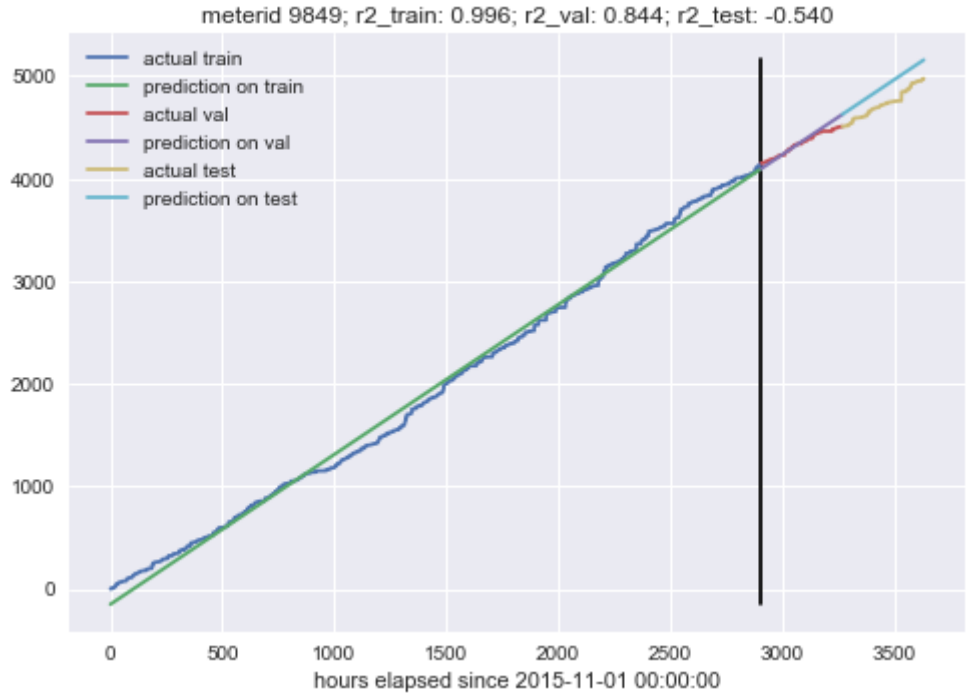

perfect fit
predicted vs actual
50000
40000
30000
20000
10000
0
0
10000
20000
30000
40000

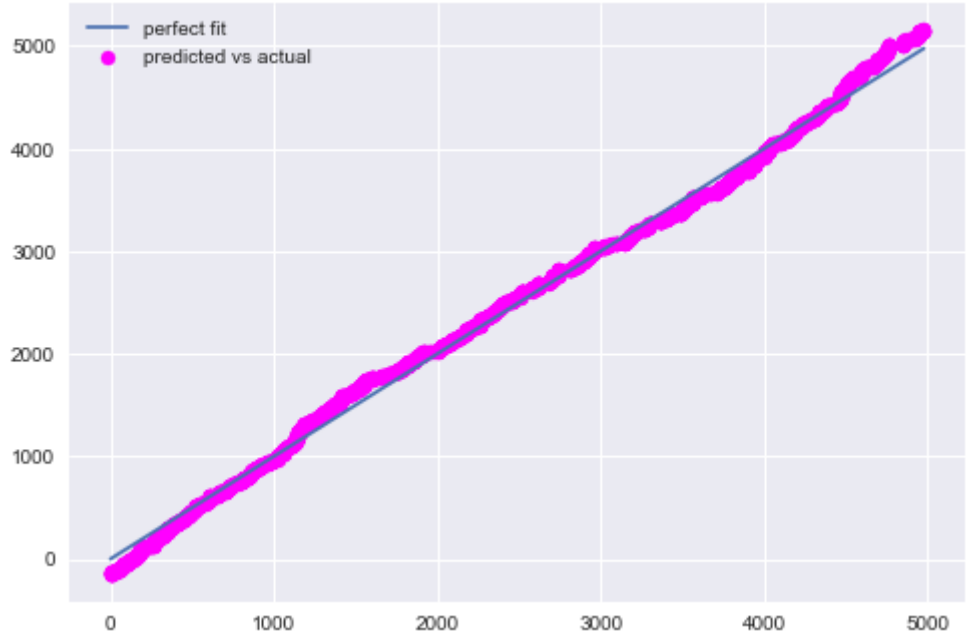

meterid 9729; r2_train: 0.974; r2_val: -55.196; r2_test: -91.587
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

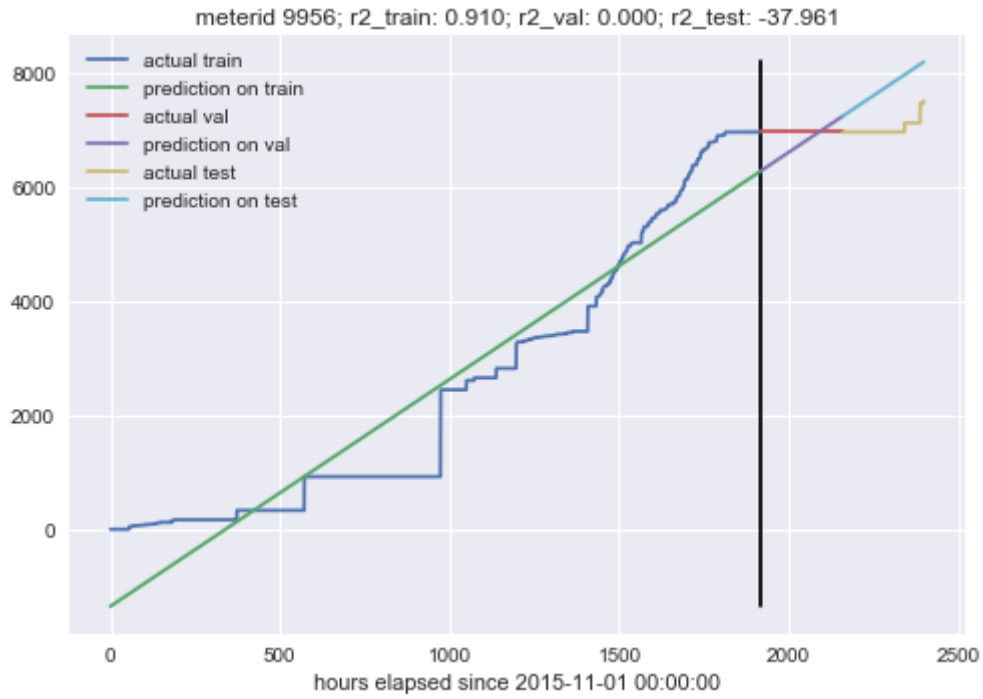

perfect fit
predicted vs actual
17500
15000
12500
10000
7500
5000
2500
0
−2500
0
2000
4000
6000
8000
10000
12000
14000

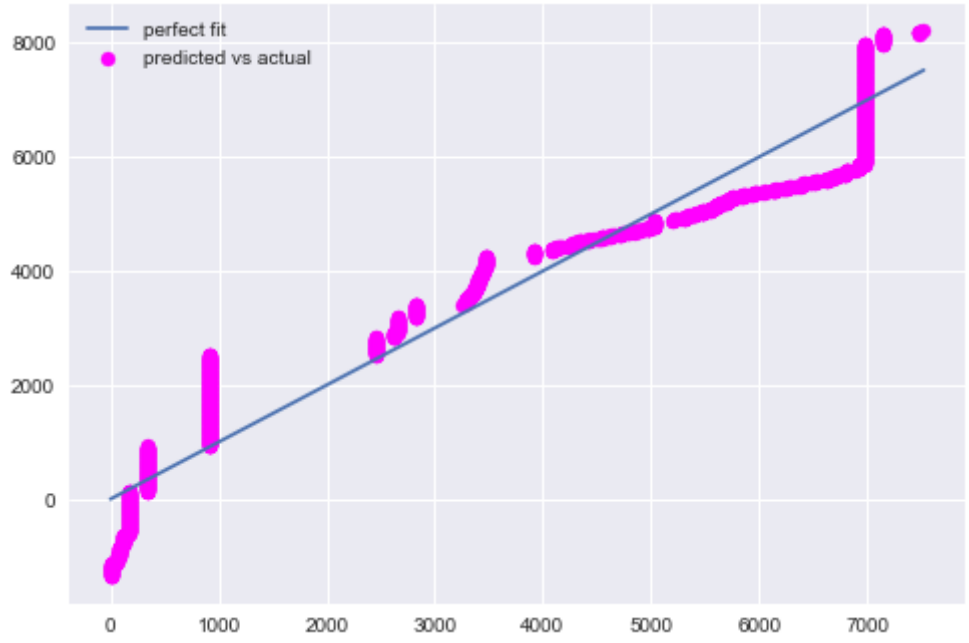

meterid 9766; r2_train: 0.978; r2_val: -37.186; r2_test: -66.845
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
25000
20000
15000
10000
5000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

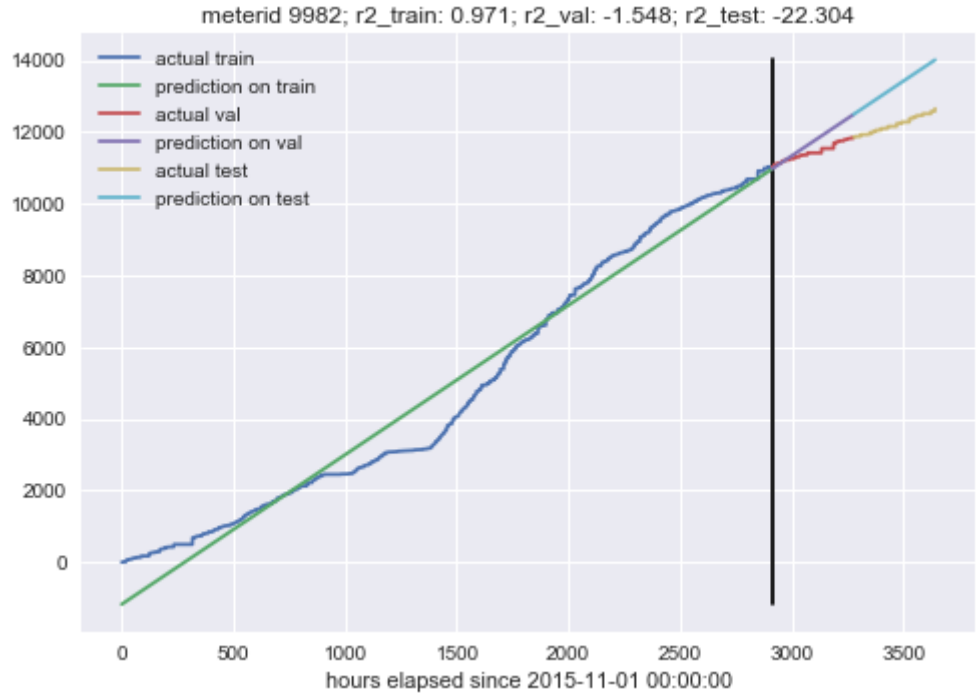

perfect fit
predicted vs actual
25000
20000
15000
10000
5000
0
0
2500
5000
7500
10000
12500
15000
17500
20000

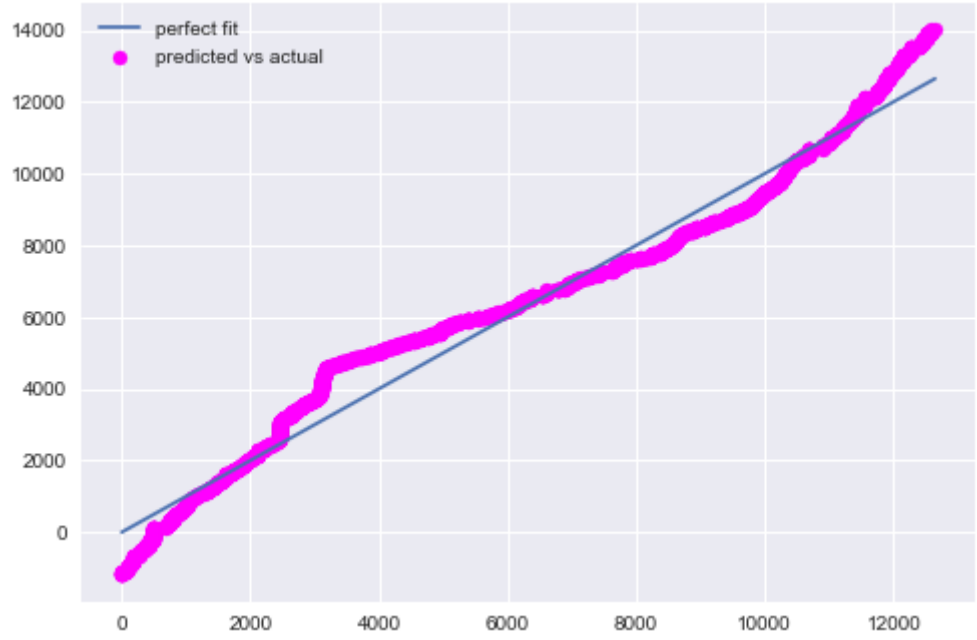

meterid 9849; r2_train: 0.996; r2_val: 0.844; r2_test: -0.540
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
5000
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00

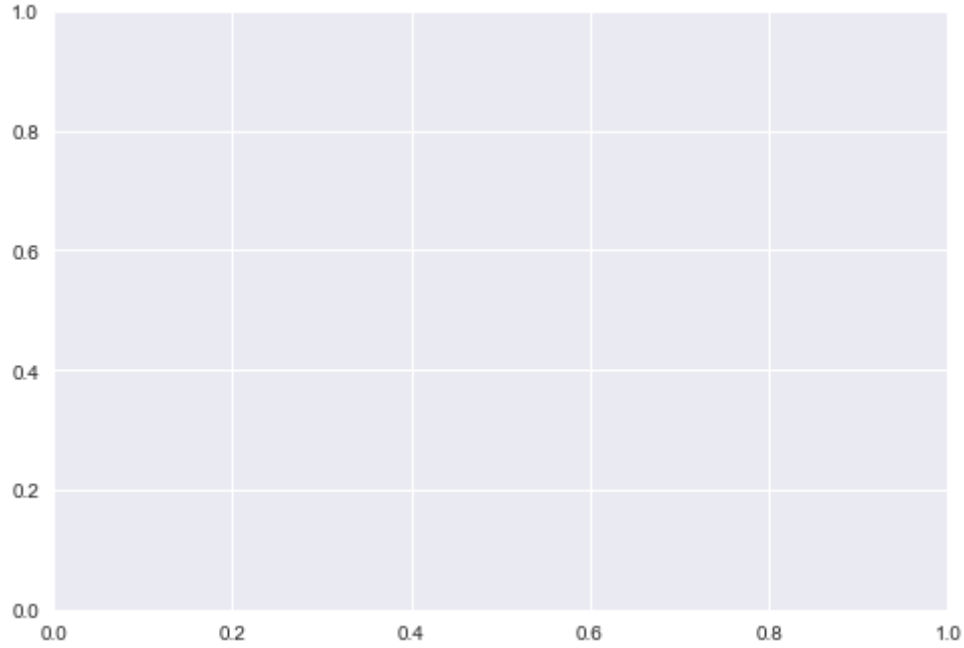

perfect fit
predicted vs actual
5000
4000
3000
2000
1000
0
0
1000
2000
3000
4000
5000


meterid 9956; r2_train: 0.910; r2_val: 0.000; r2_test: -37.961
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
8000
6000
4000
2000
0
0
1000
2000
3000
4000
5000
6000
7000


meterid 9982; r2_train: 0.971; r2_val: -1.548; r2_test: -22.304
actual train
prediction on train
actual val
prediction on val
actual test
prediction on test
14000
12000
10000
8000
6000
4000
2000
0
0
500
1000
1500
2000
2500
3000
3500
hours elapsed since 2015-11-01 00:00:00


perfect fit
predicted vs actual
14000
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000
12000



In [41]:

```
# plot line indicating train/test demarcation
test_mark = X[valid_start][0]
print(test_mark)
```

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