1 BLT set 3 over GF(41)

Points on the quadric $x_0^2 + x_1x_2 + x_3x_4$:

$P_1 = (0,1,0,0,0)$
$P_2 = (0,0,1,0,0)$
$P_3 = (0,1,27,40,27)$
$P_4 = (0,1,17,20,34)$
$P_5 = (0,1,6,8,30)$
$P_6 = (0,1,22,27,25)$
$P_7 = (0,1,38,14,9)$
$P_8 = (1,23,6,15,29)$
$P_9 = (1,25,6,20,15)$
$P_{10} = (1,17,10,34,1)$
$P_{11} = (1,21,6,2,39)$
$P_{12} = (1,39,11,20,40)$
$P_{13} = (1,37,24,28,40)$
$P_{14} = (1,24,18,36,21)$
$P_{15} = (1,18,6,28,21)$
$P_{16} = (1,9,35,24,21)$
$P_{17} = (1,23,17,40,23)$
$P_{18} = (1,34,36,39,18)$
$P_{19} = (1,19,21,30,14)$
$P_{20} = (1,38,39,38,16)$
$P_{21} = (1,35,18,8,39)$
$P_{22} = (1,14,25,31,31)$
$P_{23} = (1,17,4,14,39)$
$P_{24} = (1,19,8,26,2)$
$P_{25} = (1,30,9,37,37)$
$P_{26} = (1,32,19,19,37)$
$P_{27} = (1, 10, 17, 6, 33)\\$ 
$P_{28} = (1, 33, 27, 7, 19)\\$ 
$P_{29} = (1, 30, 36, 21, 11)\\$ 
$P_{30} = (1, 38, 21, 24, 6)\\$ 
$P_{31} = (1, 39, 6, 5, 35)\\$ 
$P_{32} = (1, 32, 3, 35, 23)\\$ 
$P_{33} = (1, 4, 12, 20, 16)\\$ 
$P_{34} = (1, 38, 21, 37, 5)\\$ 
$P_{35} = (1, 6, 32, 27, 5)\\$ 
$P_{36} = (1, 20, 24, 6, 36)\\$ 
$P_{37} = (1, 31, 17, 8, 16)\\$ 
$P_{38} = (1, 17, 37, 39, 28)\\$ 
$P_{39} = (1, 31, 35, 16, 9)\\$ 
$P_{40} = (1, 28, 9, 24, 39)\\$ 
$P_{41} = (1, 28, 1, 26, 32)\\$ 
$P_{42} = (1, 33, 24, 17, 4)\\$

Stabilizer of order 2 is generated by:

$$g_1 = \begin{pmatrix}3 & 33 & 29 & 20 & 3 \\ 35 & 15 & 5 & 37 & 38 \\ 37 & 32 & 15 & 13 & 6 \\ 22 & 6 & 38 & 24 & 25 \\ 10 & 13 & 37 & 39 & 24 \end{pmatrix}$$

Induced action on the BLT-set:

The induced group has order 2 and is generated by:


Kernel has order 1 and is generated by:
There are 21 orbits on the BLT set.
The orbit length are $[2^{21}]$
The orbits are:

$O_0 = \{1, 15\}$ (length 2)
$O_1 = \{2, 28\}$ (length 2)
$O_2 = \{3, 42\}$ (length 2)
$O_3 = \{4, 20\}$ (length 2)
$O_4 = \{5, 21\}$ (length 2)
$O_5 = \{6, 31\}$ (length 2)
$O_6 = \{7, 11\}$ (length 2)
$O_7 = \{8, 18\}$ (length 2)
$O_8 = \{9, 35\}$ (length 2)
$O_9 = \{10, 26\}$ (length 2)
$O_{10} = \{12, 23\}$ (length 2)
$O_{11} = \{13, 19\}$ (length 2)
$O_{12} = \{14, 39\}$ (length 2)
$O_{13} = \{16, 37\}$ (length 2)
$O_{14} = \{17, 30\}$ (length 2)
$O_{15} = \{22, 27\}$ (length 2)
$O_{16} = \{24, 32\}$ (length 2)
$O_{17} = \{25, 34\}$ (length 2)
$O_{18} = \{29, 36\}$ (length 2)
$O_{19} = \{33, 40\}$ (length 2)
$O_{20} = \{38, 41\}$ (length 2)

The actions induced on the orbits are:

Induced action on orbit $O_0 = \{1, 15\}$ (length 2)
The induced group has order 2 and is generated by:

$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{2, 28\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_2 = \{3, 42\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_3 = \{4, 20\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_4 = \{5, 21\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_5 = \{6, 31\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:
Induced action on orbit $O_6 = \{7, 11\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_7 = \{8, 18\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_8 = \{9, 35\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_9 = \{10, 26\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{10} = \{12, 23\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{11} = \{13, 19\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1=(1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{12} = \{14, 39\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1=(1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{13} = \{16, 37\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1=(1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{14} = \{17, 30\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1=(1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{15} = \{22, 27\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1=(1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{16} = \{24, 32\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1=(1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{17} = \{25, 34\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{18} = \{29, 36\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{19} = \{33, 40\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by:

Induced action on orbit $O_{20} = \{38, 41\}$ (length 2)
The induced group has order 2 and is generated by:
$g_1 = (1, 2)$
Kernel has order 1 and is generated by: