

# 4600103

hot street - dirt track

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



## intake exhaust

### camshaft data:

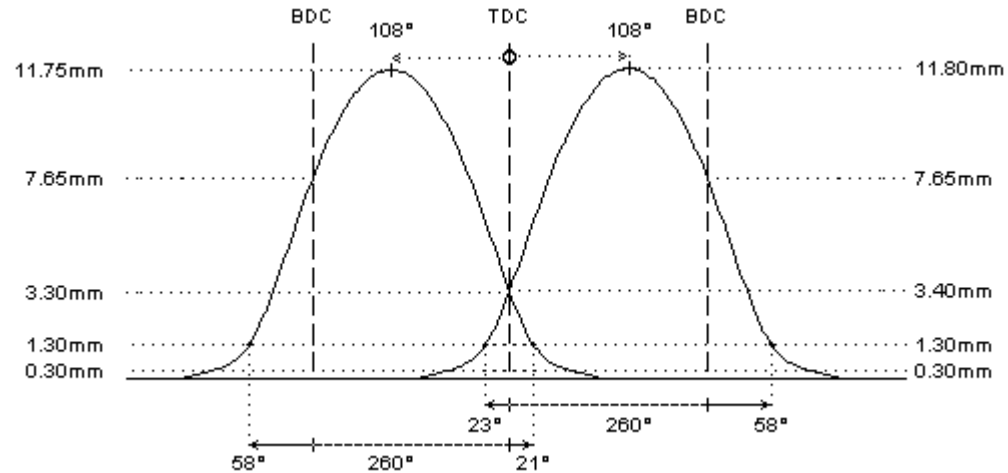
|                  |             |           |
|------------------|-------------|-----------|
| lash ramp        | : 0.30mm    | 0.30mm    |
| duration @ 0.1mm | : 315°      | 312°      |
| duration @ 1.0mm | : 261°      | 259°      |
| valve lift       | : 11.80mm   | 11.75mm   |
| cam lift         | : 7.90mm    | 7.85mm    |
| lobe angle       | : 108°      | 108°      |
| timing @ 1.0mm   | : 23° / 58° | 58° / 21° |
| valve lift @ TDC | : 3.40mm    | 3.30mm    |

### parts setup:

|                      |                     |                     |
|----------------------|---------------------|---------------------|
| cam wheels :         | : <b>TOPCIH</b>     | : <b>TOPCIH</b>     |
| follower             | : <b>CAT046</b>     | : <b>CAT046</b>     |
| valve lash           | : O.E.M.            | : O.E.M.            |
| valve                | : O.E.M.            | : O.E.M.            |
| valve locks          | : O.E.M.            | : O.E.M.            |
| upper retainer       | : O.E.M.            | : O.E.M.            |
| lower retainer       | : O.E.M.            | : O.E.M.            |
| exterior spring      | : <b>PAC-S90006</b> | : <b>PAC-S90007</b> |
| interior spring      |                     |                     |
| fitted load / length | : 0kg @ 0.0mm       | : 0kg @ 0.0mm       |
| max. load / lift     | : 0kg @ 0.0mm       | : 0kg @ 0.0mm       |

### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # FOR COMPETITION APPLICATIONS ONLY. Following details must be verified:
  - the camshafts must turn smooth in the cylinderhead, provide free travel by machining where needed
  - distance between valve seal and retainer at full lift must be 0.6mm at least
  - minimum valve spring travel of 1.0mm at full lift must be provided
  - distance between valve and piston 1.0mm (pref. 1.5mm). check 5-15° before TDC on exhaust, and after TDC on intake
- # ONLY for use in competition engines with independent engine management (throttle position sensor) or carburetors

# 4600105

tarmac rally - race

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



## intake

## exhaust

### camshaft data:

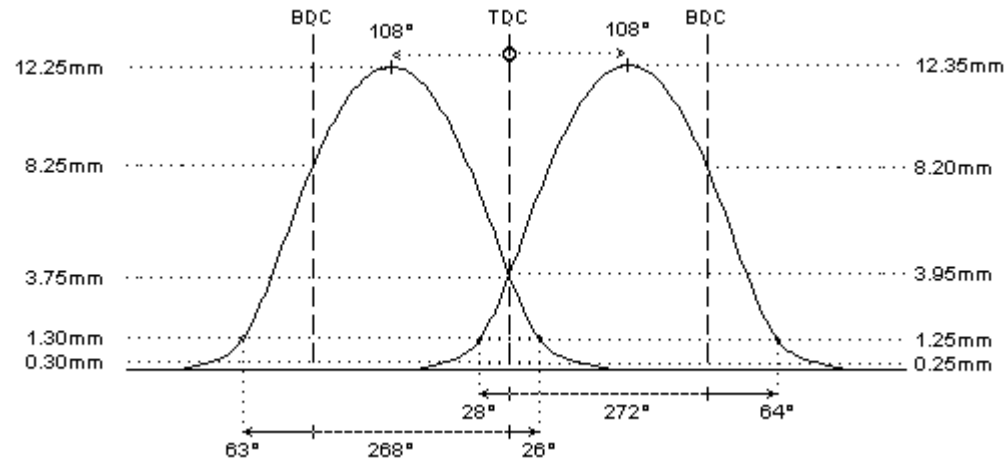
|                  |             |           |
|------------------|-------------|-----------|
| lash ramp        | : 0.25mm    | 0.30mm    |
| duration @ 0.1mm | : 331°      | 319°      |
| duration @ 1.0mm | : 272°      | 269°      |
| valve lift       | : 12.35mm   | 12.25mm   |
| cam lift         | : 8.20mm    | 8.15mm    |
| lobe angle       | : 108°      | 108°      |
| timing @ 1.0mm   | : 28° / 64° | 63° / 26° |
| valve lift @ TDC | : 3.95mm    | 3.75mm    |

### parts setup:

|                      |               |               |
|----------------------|---------------|---------------|
| cam wheels :         | :  TOPCIH     | :  TOPCIH     |
| follower             | :  CAT046     | :  CAT046     |
| valve lash           | : O.E.M.      | : O.E.M.      |
| valve                | : O.E.M.      | : O.E.M.      |
| valve locks          | : O.E.M.      | : O.E.M.      |
| upper retainer       | : O.E.M.      | : O.E.M.      |
| lower retainer       | : O.E.M.      | : O.E.M.      |
| exterior spring      | :  PAC-S90006 | :  PAC-S90007 |
| interior spring      |               |               |
| fitted load / length | : 0kg @ 0.0mm | : 0kg @ 0.0mm |
| max. load / lift     | : 0kg @ 0.0mm | : 0kg @ 0.0mm |

### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # FOR COMPETITION APPLICATIONS ONLY. Following details must be verified:
  - the camshafts must turn smooth in the cylinderhead, provide free travel by machining where needed
  - distance between valve seal and retainer at full lift must be 0.6mm at least
  - minimum valve spring travel of 1.0mm at full lift must be provided
  - distance between valve and piston 1.0mm (pref. 1.5mm). check 5-15° before TDC on exhaust, and after TDC on intake
- # ONLY for use in competition engines with independent engine management (throttle position sensor) or carburetors

# 4600109

tarmac rally - race

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



## intake

## exhaust

### camshaft data:

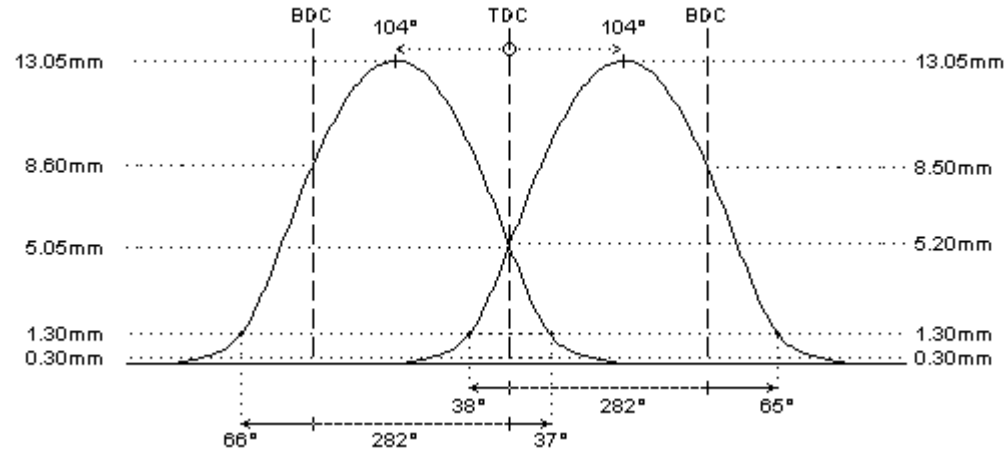
|                  |             |           |
|------------------|-------------|-----------|
| lash ramp        | : 0.30mm    | 0.30mm    |
| duration @ 0.1mm | : 341°      | 341°      |
| duration @ 1.0mm | : 283°      | 283°      |
| valve lift       | : 13.05mm   | 13.05mm   |
| cam lift         | : 8.70mm    | 8.70mm    |
| lobe angle       | : 104°      | 104°      |
| timing @ 1.0mm   | : 38° / 65° | 66° / 37° |
| valve lift @ TDC | : 5.20mm    | 5.05mm    |

### parts setup:

|                      |                     |                     |
|----------------------|---------------------|---------------------|
| cam wheels :         | : <b>TOPCIH</b>     | : <b>TOPCIH</b>     |
| follower             | : <b>CAT046</b>     | : <b>CAT046</b>     |
| valve lash           | : O.E.M.            | : O.E.M.            |
| valve                | : O.E.M.            | : O.E.M.            |
| valve locks          | : O.E.M.            | : O.E.M.            |
| upper retainer       | : O.E.M.            | : O.E.M.            |
| lower retainer       | : O.E.M.            | : O.E.M.            |
| exterior spring      | : <b>PAC-S90006</b> | : <b>PAC-S90007</b> |
| interior spring      |                     |                     |
| fitted load / length | : 0kg @ 0.0mm       | : 0kg @ 0.0mm       |
| max. load / lift     | : 0kg @ 0.0mm       | : 0kg @ 0.0mm       |

### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # FOR COMPETITION APPLICATIONS ONLY. Following details must be verified:
  - the camshafts must turn smooth in the cylinderhead, provide free travel by machining where needed
  - distance between valve seal and retainer at full lift must be 0.6mm at least
  - minimum valve spring travel of 1.0mm at full lift must be provided
  - distance between valve and piston 1.0mm (pref. 1.5mm). check 5-15° before TDC on exhaust, and after TDC on intake
- # ONLY for use in competition engines with independent engine management (throttle position sensor) or carburetors

# 4600235

sport

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



### intake

### exhaust

#### camshaft data:

|                  |            |          |
|------------------|------------|----------|
| lash ramp        | : hydro    | hydro    |
| duration @ 0.1mm | : 263°     | 263°     |
| duration @ 1.0mm | : 223°     | 223°     |
| valve lift       | : 10.90mm  | 10.90mm  |
| cam lift         | : 7.25mm   | 7.25mm   |
| lobe angle       | : 110°     | 110°     |
| timing @ 1.0mm   | : 1° / 42° | 41° / 2° |
| valve lift @ TDC | : 1.15mm   | 1.20mm   |

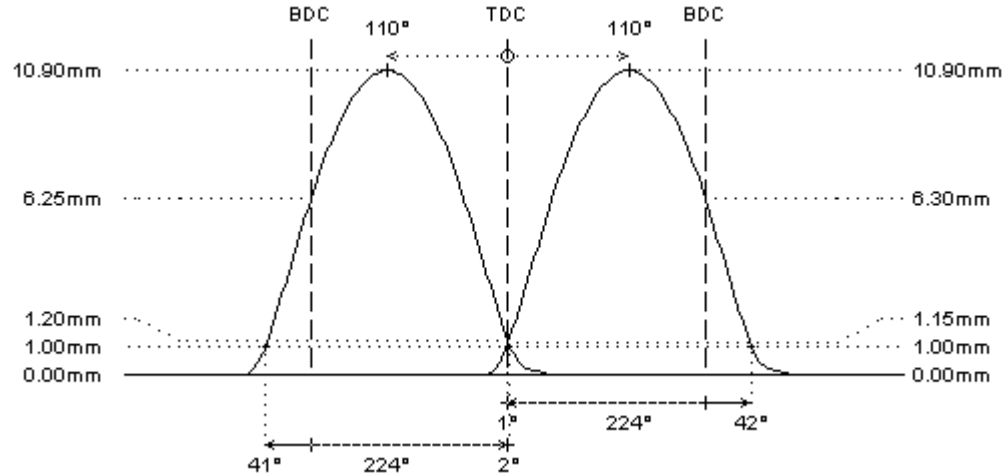
#### parts setup:

|                 |          |          |
|-----------------|----------|----------|
| cam wheels :    | :        | :        |
| follower        | : O.E.M. | : O.E.M. |
| valve lash      | : O.E.M. | : O.E.M. |
| valve           | : O.E.M. | : O.E.M. |
| valve locks     | : O.E.M. | : O.E.M. |
| upper retainer  | : O.E.M. | : O.E.M. |
| lower retainer  | : O.E.M. | : O.E.M. |
| exterior spring | : O.E.M. | : O.E.M. |
| interior spring | :        | :        |

|                      |               |               |
|----------------------|---------------|---------------|
| fitted load / length | : 0kg @ 0.0mm | : 0kg @ 0.0mm |
| max. load / lift     | : 0kg @ 0.0mm | : 0kg @ 0.0mm |

#### REMARKS :

# original valve spring info is not available



#### REMARKS :

# - chilled cast iron camshafts

# Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.

# 4600236

sport

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



### intake

### exhaust

#### camshaft data:

|                  |            |          |
|------------------|------------|----------|
| lash ramp        | : hydro    | hydro    |
| duration @ 0.1mm | : 272°     | 272°     |
| duration @ 1.0mm | : 231°     | 231°     |
| valve lift       | : 11.25mm  | 11.25mm  |
| cam lift         | : 7.50mm   | 7.50mm   |
| lobe angle       | : 108°     | 108°     |
| timing @ 1.0mm   | : 7° / 44° | 43° / 8° |
| valve lift @ TDC | : 1.85mm   | 1.85mm   |

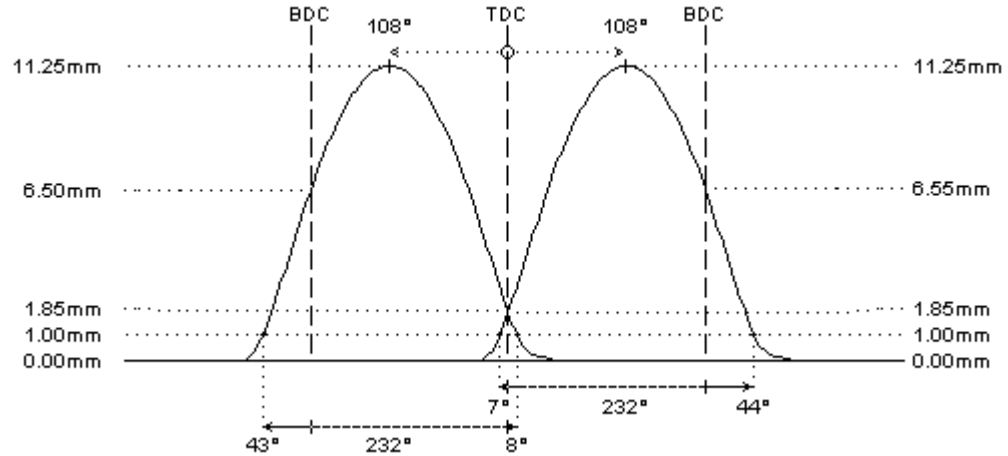
#### parts setup:

|                 |          |          |
|-----------------|----------|----------|
| cam wheels :    | :        | :        |
| follower        | : O.E.M. | : O.E.M. |
| valve lash      | : O.E.M. | : O.E.M. |
| valve           | : O.E.M. | : O.E.M. |
| valve locks     | : O.E.M. | : O.E.M. |
| upper retainer  | : O.E.M. | : O.E.M. |
| lower retainer  | : O.E.M. | : O.E.M. |
| exterior spring | : O.E.M. | : O.E.M. |
| interior spring | :        | :        |

|                      |               |               |
|----------------------|---------------|---------------|
| fitted load / length | : 0kg @ 0.0mm | : 0kg @ 0.0mm |
| max. load / lift     | : 0kg @ 0.0mm | : 0kg @ 0.0mm |

#### REMARKS :

# original valve spring info is not available



#### REMARKS :

# - chilled cast iron camshafts

# Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.

# 4600237

hot street - dirt track

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



### intake

### exhaust

#### camshaft data:

|                  |             |           |
|------------------|-------------|-----------|
| lash ramp        | : hydro     | hydro     |
| duration @ 0.1mm | : 282°      | 282°      |
| duration @ 1.0mm | : 239°      | 239°      |
| valve lift       | : 11.65mm   | 11.65mm   |
| cam lift         | : 7.75mm    | 7.75mm    |
| lobe angle       | : 108°      | 108°      |
| timing @ 1.0mm   | : 11° / 48° | 47° / 12° |
| valve lift @ TDC | : 2.35mm    | 2.35mm    |

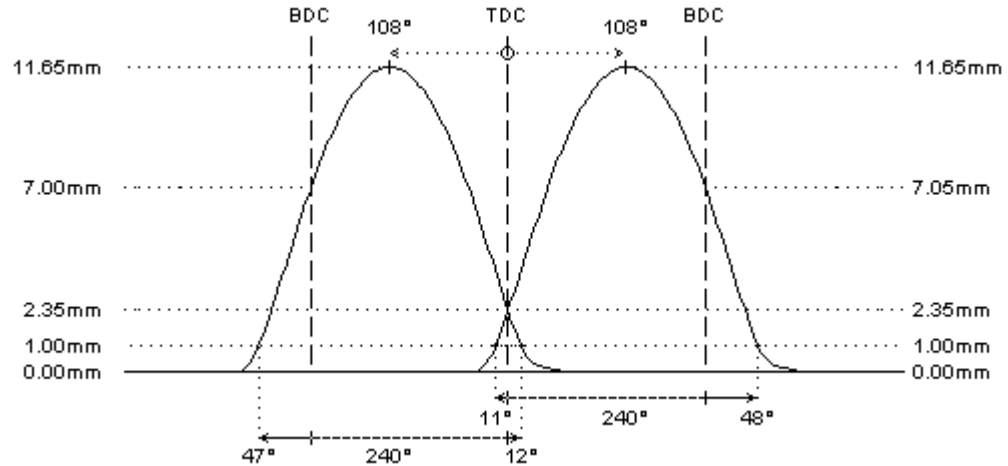
#### parts setup:

|                 |               |               |
|-----------------|---------------|---------------|
| cam wheels :    | :  TOPCIH     | :  TOPCIH     |
| follower        | : O.E.M.      | : O.E.M.      |
| valve lash      | : O.E.M.      | : O.E.M.      |
| valve           | : O.E.M.      | : O.E.M.      |
| valve locks     | : O.E.M.      | : O.E.M.      |
| upper retainer  | : O.E.M.      | : O.E.M.      |
| lower retainer  | : O.E.M.      | : O.E.M.      |
| exterior spring | :  PAC-S90006 | :  PAC-S90007 |
| interior spring |               |               |

|                      |               |               |
|----------------------|---------------|---------------|
| fitted load / length | : 0kg @ 0.0mm | : 0kg @ 0.0mm |
| max. load / lift     | : 0kg @ 0.0mm | : 0kg @ 0.0mm |

#### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



#### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # ONLY for dirt track applications and pro street use with adjustable engine management or carburetors

# 4600238

hot street - dirt track

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



### intake

### exhaust

#### camshaft data:

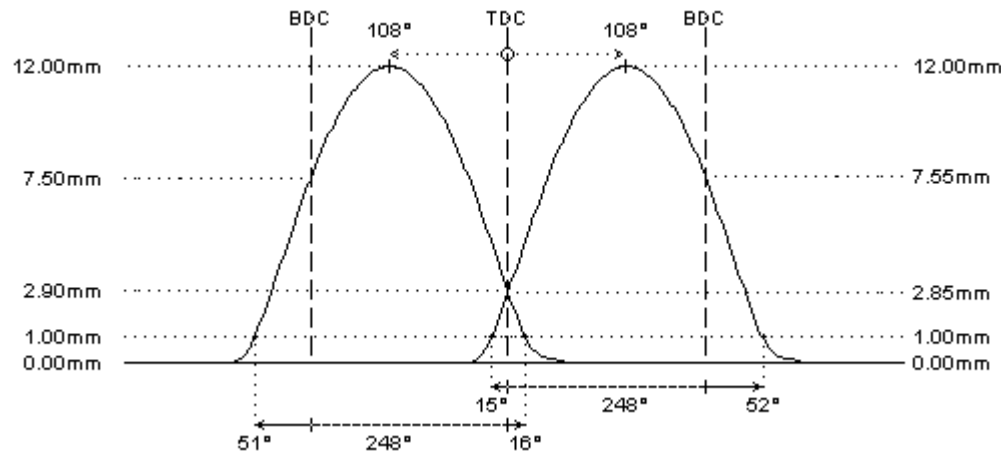
|                  |             |           |
|------------------|-------------|-----------|
| lash ramp        | : hydro     | hydro     |
| duration @ 0.1mm | : 291°      | 291°      |
| duration @ 1.0mm | : 247°      | 247°      |
| valve lift       | : 12.00mm   | 12.00mm   |
| cam lift         | : 8.00mm    | 8.00mm    |
| lobe angle       | : 108°      | 108°      |
| timing @ 1.0mm   | : 15° / 52° | 51° / 16° |
| valve lift @ TDC | : 2.85mm    | 2.90mm    |

#### parts setup:

|                      |                     |                     |
|----------------------|---------------------|---------------------|
| cam wheels :         | : <b>TOPCIH</b>     | : <b>TOPCIH</b>     |
| follower             | : O.E.M.            | : O.E.M.            |
| valve lash           | : O.E.M.            | : O.E.M.            |
| valve                | : O.E.M.            | : O.E.M.            |
| valve locks          | : O.E.M.            | : O.E.M.            |
| upper retainer       | : O.E.M.            | : O.E.M.            |
| lower retainer       | : O.E.M.            | : O.E.M.            |
| exterior spring      | : <b>PAC-S90006</b> | : <b>PAC-S90007</b> |
| interior spring      |                     |                     |
| fitted load / length | : 0kg @ 0.0mm       | : 0kg @ 0.0mm       |
| max. load / lift     | : 0kg @ 0.0mm       | : 0kg @ 0.0mm       |

#### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



#### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # FOR COMPETITION APPLICATIONS ONLY. Following details must be verified:
  - the camshafts must turn smooth in the cylinderhead, provide free travel by machining where needed
  - distance between valve seal and retainer at full lift must be 0.6mm at least
  - minimum valve spring travel of 1.0mm at full lift must be provided
  - distance between valve and piston 1.0mm (pref. 1.5mm). check 5-15° before TDC on exhaust, and after TDC on intake
- # ONLY for dirt track applications and pro street use with adjustable engine management or carburetors

# 4600239

turbo conversion

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



### intake

### exhaust

#### camshaft data:

|                  |            |           |
|------------------|------------|-----------|
| lash ramp        | : hydro    | hydro     |
| duration @ 0.1mm | : 282°     | 263°      |
| duration @ 1.0mm | : 239°     | 223°      |
| valve lift       | : 11.65mm  | 10.90mm   |
| cam lift         | : 7.75mm   | 7.25mm    |
| lobe angle       | : 110°     | 120°      |
| timing @ 1.0mm   | : 9° / 50° | 51° / -8° |
| valve lift @ TDC | : 2.10mm   | 0.45mm    |

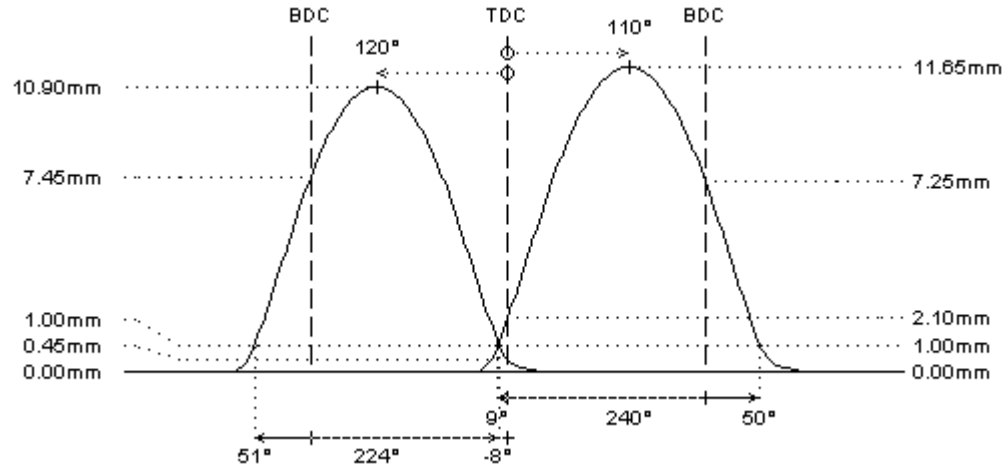
#### parts setup:

|                 |               |               |
|-----------------|---------------|---------------|
| cam wheels :    | :  TOPCIH     | :  TOPCIH     |
| follower        | : O.E.M.      | : O.E.M.      |
| valve lash      | : O.E.M.      | : O.E.M.      |
| valve           | : O.E.M.      | : O.E.M.      |
| valve locks     | : O.E.M.      | : O.E.M.      |
| upper retainer  | : O.E.M.      | : O.E.M.      |
| lower retainer  | : O.E.M.      | : O.E.M.      |
| exterior spring | :  PAC-S90006 | :  PAC-S90007 |
| interior spring |               |               |

|                      |               |               |
|----------------------|---------------|---------------|
| fitted load / length | : 0kg @ 0.0mm | : 0kg @ 0.0mm |
| max. load / lift     | : 0kg @ 0.0mm | : 0kg @ 0.0mm |

#### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



#### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # for TURBO conversion (atmospheric to turbo)



# 4600240

turbo conversion

Opel CIH (1.6 > 2.4L)

I-4cyl 2.0L 8v SOHC (FTH/FTH)



### intake

### exhaust

#### camshaft data:

|                  |             |           |
|------------------|-------------|-----------|
| lash ramp        | : hydro     | hydro     |
| duration @ 0.1mm | : 291°      | 272°      |
| duration @ 1.0mm | : 247°      | 231°      |
| valve lift       | : 12.00mm   | 11.25mm   |
| cam lift         | : 8.00mm    | 7.50mm    |
| lobe angle       | : 110°      | 120°      |
| timing @ 1.0mm   | : 13° / 54° | 55° / -4° |
| valve lift @ TDC | : 2.60mm    | 0.70mm    |

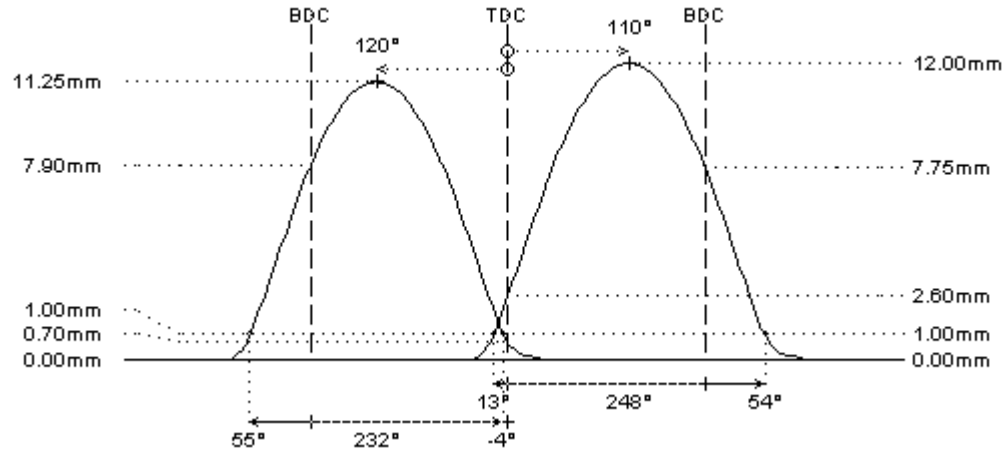
#### parts setup:

|                 |               |               |
|-----------------|---------------|---------------|
| cam wheels :    | :  TOPCIH     | :  TOPCIH     |
| follower        | : O.E.M.      | : O.E.M.      |
| valve lash      | : O.E.M.      | : O.E.M.      |
| valve           | : O.E.M.      | : O.E.M.      |
| valve locks     | : O.E.M.      | : O.E.M.      |
| upper retainer  | : O.E.M.      | : O.E.M.      |
| lower retainer  | : O.E.M.      | : O.E.M.      |
| exterior spring | :  PAC-S90006 | :  PAC-S90007 |
| interior spring |               |               |

|                      |               |               |
|----------------------|---------------|---------------|
| fitted load / length | : 0kg @ 0.0mm | : 0kg @ 0.0mm |
| max. load / lift     | : 0kg @ 0.0mm | : 0kg @ 0.0mm |

#### REMARKS :

# in most engines, the std valve springs can be replaced by PAC-S99006 (intake) and PAC-S99007 (exhaust) without further modifications.



#### REMARKS :

- # - chilled cast iron camshafts
- # Valve lift and timing specifications assume fixed rocker arm ratio of RR1,500. This can be obtained by replacing the O.E.M. rocker arms by the Catcams Roller rocker arms.
- # for TURBO conversion (atmospheric to turbo)