



# TROUBLE TRACER CHART CAMTRAIN

## Broken camshaft



**Appearance:** Camshaft breakage between or through cam-lobes.  
**Causes:** Distorted camshaft housing or cylinder head. Incorrect torque sequence and mishandling can also cause similar breakage.  
**Remedy:** Straighten or replace camshaft carrier/cylinder head, use correct bolt torque sequence and handle with care. Thoroughly flush the lubricating system, replace cam and followers, prime with extreme pressure lubricant and replace oil and oil filter.

## Follower breakage



**Causes:** Mechanical overload resulting from:  
**1** Sticking or seized valve, resulting in the follower to break due to cam-lobe pressure.  
**2** Piston contact with the valve due to:  
 a Weak valve spring  
 b Over extended hydraulic lifter  
 c Incorrect assembly of valve tip-cap  
 d Timing belt breakage  
 e Or through over high revving of engine.  
**3** Incorrect valve timing.  
**Remedy:** Investigate & rectify the mechanical overload cause. Thoroughly flush the lubricating system, replace all damage components, prime cam and followers, with extreme pressure lubricant and replace oil and oil filter.

## Excessive cam-lobe wear



**Appearance:** Severe cam-lobe wear.  
**Causes:** Starvation or contamination of oil, tappet clearance too tight, excessive valve spring pressure.  
**Remedy:** Thoroughly flush the lubrication system, install new camshaft and followers. Adjust tappets to the correct clearances, prime with extreme pressure lubricant and replace oil and oil filter.

## Cam-lobe and follower wear



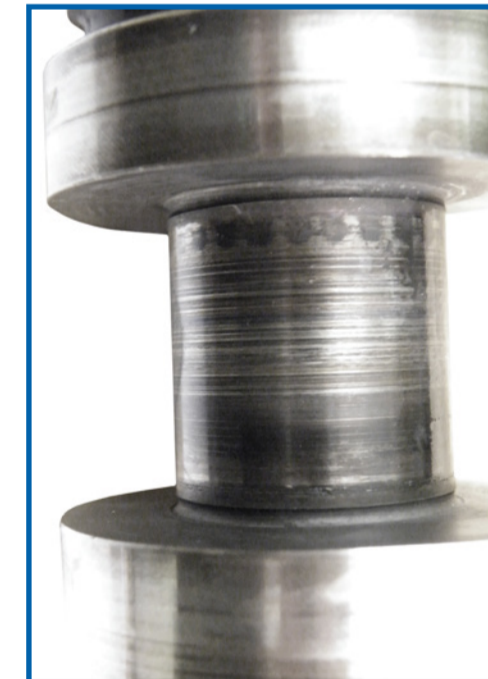
**Appearance:** Premature wear of one or more cam-lobes & followers. Follower contact surface will be concaved with chipped edges.  
**Causes:** Incompatible cam-lobe & follower contact surface geometry. Often caused by fitting new camshaft with old followers or vice versa. Can also result from lubricant starvation from blocked or restriction in oil supply.  
**Remedy:** Thoroughly flush the lubricating system, replace cam and followers, prime with extreme pressure lubricant and replace oil and oil filter. Do not mix old and new components.

## 'Scored' bearings



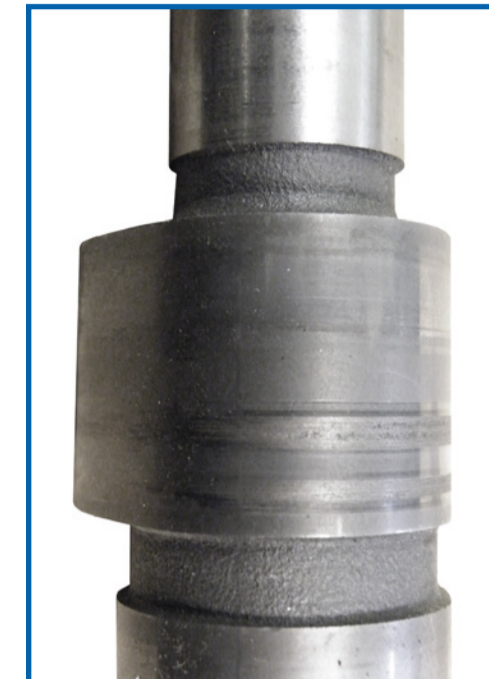
**Appearance:** Severe scoring of the camshaft bearings.  
**Causes:** Starvation or contamination of oil, i.e. foreign particles circulating in oil.  
**Remedy:** Thoroughly flush the lubricating system, replace cam and followers, prime with extreme pressure lubricant and replace oil and oil filter.

## Overheated camshaft



**Appearance:** Cam-lobes, bearings & followers have a 'blue' discoloration.  
**Causes:** Overheated engine possibly due to cooling failure.  
**Remedy:** Investigate and rectify the cause of the overheating. Thoroughly flush the lubricating system, replace cam and followers, prime with extreme pressure lubricant and replace oil and oil filter.

## Base circle contact marking



**Appearance:** Witness marking on base circle of cam-lobes, biased to one side.  
**Causes:** Worn hydraulic lifter and/or retainer springs.  
**Remedy:** Replace cam and followers if marks are deep, otherwise set tappets to correct clearance. Thoroughly flush the lubricating system and replace oil and filter.

## Carbonised oil deposits



**Appearance:** Carbonised oil build-up on cam and followers.  
**Causes:** Excessive operating temperatures resulting from marginal lubrication conditions due to contaminated lubricating oil or blockages/restrictions in oil feed galleries.  
**Remedy:** Thoroughly flush the lubrication system, ensuring that all galleries and hydraulic lifters (where fitted) are free from blockages & debris. Install new camshaft and followers, prime with extreme pressure lubricant and replace oil and oil filter.

## Physical damage to camshaft & followers



**Appearance:** Cam-lobes, bearings & followers "chipped".  
**Causes:** Excessive end-float due to:  
 a Worn thrust washer  
 b Loose distributor  
 c Worn distributor drive gear  
 d Or misaligned timing gears  
**Remedy:** Investigate and rectify the cause of the damage. Thoroughly flush the lubricating system, replace cam and followers, prime with extreme pressure lubricant and replace oil and oil filter.

