

## BMW PRESENTS BMW首映大賞

Saturday, July 4 at 10:00pm 7月4日 週六 晚上10點 播出


**NATIONAL GEOGRAPHIC**  
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# Train wreck

## 拆解火車頭

This SD-40 locomotive has hauled freight across North America's heartland for over 40 years. Now it's reached the end of the line. One hundred tonnes of steel, six sets of wheels and a fourteen-and-a-half-tonne engine must be **salvaged**, melted or refurbished, so it can be reborn and returned to the rail industry.

這列SD-40火車頭在北美中部拖貨櫃已超過四十年，如今已屆退休之年。一百公噸鋼鐵、六對車輪及十四點五公噸重的引擎必須被拆解、鎔化或翻新，如此才能再生，然後返回鐵路工業。

Railroads are the **backbone** of American industry. Over 270,000km of track crisscross the country from coast to coast moving nearly two billion tonnes of freight every year. At the center of it all sits Kansas City, the second largest rail junction in the US. Two hundred thousand trains pass through this location every year. But today, two locomotives owned by Kansas City Southern — or KCS — will stop running. Numbers 672 and 605 have been on the rails for over 40 years. But now their engine technology is **inefficient** and fuel prices are at an all-time high so these locomotives are headed for the scrap yard to be broken down.

鐵路是美國工業的骨幹，從東岸到西岸，超過二十七萬公里長的鐵軌交叉遍佈全國，每年搬運將近二十億公噸貨物。其中心是美國第二大鐵路樞紐堪薩斯市，每年有二十萬列火車經過此地，但如今堪薩斯市南方鐵路公司（簡稱KCS），所擁有的兩列火車頭將停止營運。672和605號火車頭，已在鐵軌上跑了四十多年，但如今它們的引擎技術效能不彰，加上燃料價格來到歷史新高，因此這兩列火車頭要前往報廢場被分解。

Scrap and recycling company Erman usually scraps much lighter train equipment so this locomotive pair is almost too much for the rails to handle. They'll need to **systematically** dismantle the locomotives, cutting through solid steel without damaging the internal components or their auxiliary parts. A locomotive is designed to be almost **indestructible** — in this case, a 160-tonne construction of cast and welded steel. Each piece must be taken out by hand with blowtorches. The breakdown will happen from the top down in three steps. Step one, the strip down: cut and skin the steel outer shell of the locomotive to expose its power core. Step two, the gut out: remove the locomotive's internal organs — the prime mover and generator. And step three, the final breakdown: cut away the cab, and torch up the over seven-centimeter-thick solid steel locomotive bed to salvage the wheels and supports. It's a job that takes experience, skill and a healthy respect for locomotives.

爾曼企業拆解的多半是比較輕的火車設備，這對火車頭對鐵



軌而言是過於沉重的負擔。他們需要計畫地拆解火車頭，以不破壞內部組件或附屬零件的方式切割鋼鐵，火車頭的設計幾乎無法破壞。這列火車頭是由一百六十公噸的鑄鋼製成，每塊鑄鋼都要用焊槍精準地拆解開來，拆解方式由上而下，分為三個步驟。第一步，拆除外殼：切割拆除火車頭的鋼鐵外殼，露出內部的動力核心。第二步，取出內部裝置：移除火車頭的內部機件——原動機和發電機。第三步，最後的解體：切除駕駛室，用焊槍切開超過七公分厚的鋼鐵火車頭底層，好拆解輪胎和支架。這是一項需要經驗、技術和對火車頭心存敬意的工作。

Number 672 will be the first to go. The team needs to cut through layers of solid steel and blowtorches are the only way to do it. The flame is 50 percent acetylene gas and 50 percent oxygen — the only mixture that burns hot enough to cut steel, 3,480°C to be exact. Direct contact with this heat could be deadly, so each worker must wear a face shield and protective clothing. But the flames aren't the only **hazard**. A machine this old is a potential powder keg. Oil and fuel residues are all over this locomotive. One wrong move with a blowtorch could ignite an explosion.

首先要拆解的是672號。工作團隊要切開鋼鐵，唯一可行的方式是使用焊槍，火焰含有百分之五十乙炔和百分之五十氧氣，這是唯一能燃燒到可切割鋼鐵的混合物，正確的溫度是攝氏三千四百八十度。直接接觸如此的高溫有致命危險，每個工人都必須穿戴面部防護罩和稱為皮衣的防護衣。但火焰並非唯一的危險，如此老舊的機器很容易變成火藥桶，火車頭上到處都有油和燃料的殘餘物，焊槍一個不小心就會引燃。



Top: Locomotives 672 and 605 awaiting a breakdown.

Above: The prime mover of the locomotive has been removed.

Left: Wheel sets waiting to be refurbished. Far left: Locomotive 605 awaiting a breakdown at Erman Scrap and Recycling.

PHOTOS COURTESY OF NATIONAL GEOGRAPHIC CHANNEL

最上圖：等待拆解的672和605號火車頭。

上圖：火車頭的原動機已被拆除。

左圖：拆卸後準備再磨光的動輪部分。

最左圖：爾曼報廢回收場內等待拆解的605號火車頭。

照片由國家地理頻道提供



### TODAY'S WORDS 今日單字

1. **salvage** /'sælvɪdʒ/ v.  
搶救 (qiang3 jiu4), 打撈 (da3 lao1)

2. **backbone** /'bæk,bon/ n.  
骨幹 (gu3 gan4)

3. **inefficient** /ɪn'efɪfənt/ adj.  
效能差的 (xiao4 neng2 cha1 de5)

4. **systematically** /,sɪstə'mætɪklɪ/ adv.  
有計畫地 (you3 ji4 hua4 de5)

5. **indestructible** /,ɪndɪ'strʌktəbl/ adj.  
不能破壞的 (bu4 neng2 po4 huai4 de5)

6. **hazard** /'hæzəd/ n.  
危險 (wei2 xian3)