




MORSE HY-VO Chain

2002 MORSE Application Guide for Automatic Transmission and Transfer Case Chains



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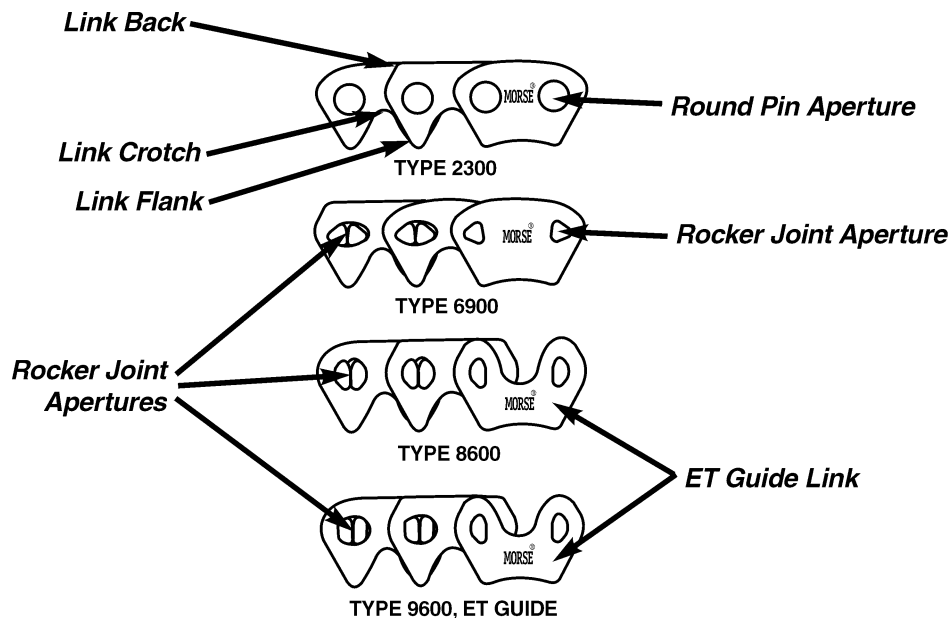
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Interchange back cover

Link and Pin Nomenclature



NOTE: A round pin chain can be rolled into a ball. A rocker pin chain cannot be. Each type requires certain sprockets and should not be interchanged. ET guide (elastically tuned) type guide links began in 1995 on certain applications. ET guide links more evenly distribute load for better wear characteristics.

Chain Components

- **Link Apertures:** Holes in Links either round or Rocker Joint shaped to match the connecting Pins. This is the area of articulation in the chain.
- **Guide Link:** Link plate positioned on the outside of the chain. This pilots the chain on the sprocket.
- **Link Flank:** Lower portion of link which engages the sprocket teeth.
- **Link Crotch:** Space between link flanks which clear the sprocket tooth tip.
- **Link Back:** The outside curvature of the Link design to provide strength and operating smoothness. Some are designed flat rather than curved.
- **Round Pin:** Singular round pin used to articulate the chain.
- **Rocker Joint Pin:** Two pins are utilized to articulate the chain.
- **Rocker Pin Styles:**
 - **Type 6900** two triangular pins that rock in the aperture
 - **Type 8600** two ovular-shaped pins that rock in the aperture (Some may be ET Guide.)
 - **Type 9600** two ovular-shaped pins that rock in the aperture. The guide link is an ET design riveted link.

Chain Quality Parameters

- **Tensile Strength:** The ability of the chain to endure under the loads that are applied during sprocket engagement and operation. It is measured as the ultimate strength of the chain which is the load at which it would break or fail. There are centrifugal forces created during operation. The steel quality of the links and pins and the chain design are important in contributing to a high tensile strength.
- **Fatigue Strength:** The ability of the chain to endure the loads and operating conditions repeatedly over time.
- **Wear Rating:** The amount of wear that occurs during operation.

Chain Operating & Measurement Terms

- **Pitch:** Effective length between the centerpoints of the apertures, which are the points of joint articulation.
- **Width:** The approximate dimension between the inside and outside guide links.
- **Random Chain:** Certain patterns are interlaced in a random link pattern utilizing two different link styles in rows across the chain.
- **Chordal Action:** Radial or transverse motion of the chain strand resulting from sprocket engagement. Sound is created from this engagement.
- **Decibel Measurements:** The measurement of the total sound coming from the system in operation.
- **Chain Description:** Nominal measurements for a chain:
 - Example: 3/8P x 1-1/4 W x 72P
 - 3/8 pitch by 1-1/4 approximate width by 72 total pitches
 - 72 pitches would be 36 total guide plates per side



Why Morse Hy-Vo Chain?

Design Features and Benefits

Application Specific Design Styles: Morse offers a full line of applications which include round pin, three styles of rocker joint pin chain, ET guide links, and the new patented Morse Gemini[®] system. Each of these are specified by application based upon loads, operating conditions, and operating space. (Substituting design styles is not recommended since sprocket engagement would be affected.)

ET Guide Links: A patented guide link design which offers more even load distribution during operation. Chain designs will be upgraded based upon OE service conversions.

Chain Randomization: This is a patented design utilizing two different link styles to break up frequencies created from sprocket engagement. Patterns are selected at the time of OE design to minimize noise and vibration levels and to optimize operating strengths for each application.

Quality Features and Benefits

Quality and OEM Certification: In addition to having QS 9000 Certification, Morse Hy-Vo Products utilize only the finest grades of steel for the links and pins. This means no inclusions or dirt in the steel itself. This contributes to the highest Tensile, Fatigue, and Wear characteristics. Proprietary Design and Manufacturing Techniques also create the highest quality chain in the aftermarket.

Important Rebuilding Notes

Chain Elongation: Even though Morse Hy-Vo Products are built to last, when the rebuilder has the unit down, the sprockets and chain should be checked thoroughly.

Remember that it is very difficult for the aftermarket customer to measure chain elongation. One reason for this is shaft movement when the unit is apart. In certain cases, when the shafts are fixed with the cover off, an experienced field estimate may be acceptable.

Morse has special equipment to measure elongation parameters. In addition, each application could be different depending upon the application parameters.

The accuracy rate or error rate is 50% without using the right equipment to measure elongation of a chain. Every application has its own variations and the manufacturer's recommended specifications for chain tolerances should be referenced.

**If the chain has been in service for over 60,000 miles,
if the unit is torn down, or if the unit shows
signs of problems, neglect, or abuse – replace the chain.**

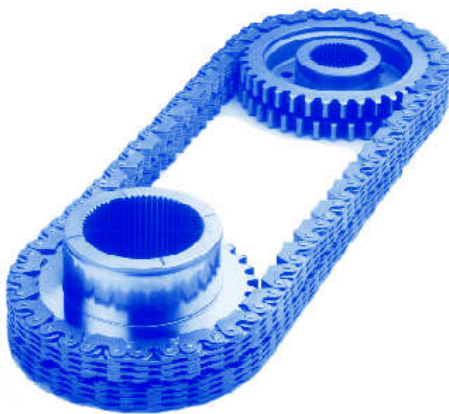
Application Listings for Morse Hy-Vo Chain

Automatic Transmission Chains

Transmission	Description	Year	Morse Part Number
General Motors			
125/125C	3/8 Pitch x 3/4 Wide x 84 Pitches, Round Pin Type	80-83	HV-019
125C	3/8 Pitch x 7/8 Wide x 84 Pitches, Round Pin Type	80-Up	HV-018
325	3/8 Pitch x 1-3/4 Wide x 110 Pitches, Rocker Joint Type	79-81	HV-010
325-4L	3/8 Pitch x 1-1/4 Wide x 102 Pitches, Rocker Joint Type	82-85	HV-016
425	3/8 Pitch x 2 Wide x 124 Pitches, Rocker Joint Type	66-78	HV-001
4T40E	3/8 Pitch x 3/4 Wide x 84 Pitches, Rocker Joint Type	95-Up	HV-039
4T45E	3/8 Pitch x 7/8 Wide x 84 Pitches, Rocker Joint Type, ET guide	99-Up	HV-058
4T60/4T60E	3/8 Pitch x 7/8 Wide x 84 Pitches, Round Pin Type	83-93	HV-018
4T60E	3/8 Pitch x 7/8 Wide x 84 Pitches, Rocker Joint Type, ET guide (Previously HV035)	94-99	HV-058
4T60E (Riviera)	3/8 Pitch x 7/8 Wide x 84 Pitches, Rocker Joint Type (Previously HV036 with a Special Lacing Pattern for Riviera only – the HV058 accommodates this)	95-99	HV-058
4T60 Allante Only	1990 Cadillac GM # 8661010 is not available. Discontinued.	90	
4T65 Gemini Design	3/8 Pitch x 1/2 Wide x 84 Pitch – Two per Application	97-Up	HV-065
4T65 Gemini Kit	With 33 Drive & 37 Driven Sprockets – Kit Sprockets and Gemini Chains (Volvo)	97-Up	TK001*
4T65 Gemini Kit	With 35 Drive & 35 Driven Sprockets – Kit Sprockets and Gemini Chains	97-Up	TK002*
4T65 Gemini Kit	With 37 Drive & 33 Driven Sprockets – Kit Sprockets and Gemini Chains (3.8L, L67 Grand Prix)	97-Up	TK003*
4T80E	.436 Pitch x 1 Wide x 84 Pitches, Rocker Joint Type	93-Up	HV-038

Morse Gemini® Chain System

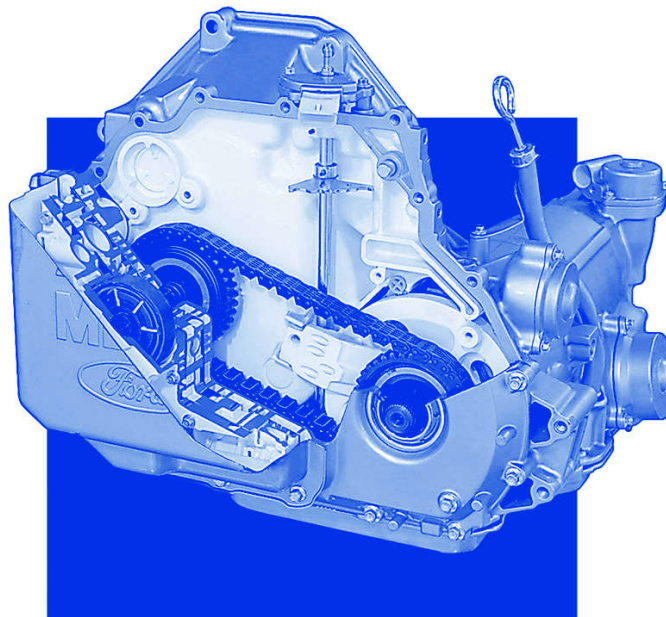
*Use with new thrust washers from GM #24213762, Volvo #24213761 and reluctor wheel #24212217.



Morse Gemini® systems are a set of 2 chains which run on phased sprockets. This patented design significantly reduces the overall NVH (noise) in the system.

Transmission	Description	Year	Morse Part Number
Ford			
AXOD/AXODE	3/8 Pitch x 3/4 Wide x 86 Pitches, Round Pin Type (one copper guide link)	86-Up	HV-021
AXOD	3/8 Pitch x 7/8 Wide x 86 Pitches, Round Pin Type (one green guide link)	86-88	HV-029
AX4S-SHO/AX4N	3/8 Pitch x 3/4 Wide x 86 Pitches, Rocker Joint Type, ET Guide (three copper guide links)	93-Up	HV-040
AX4N Lincoln	3/8 Pitch x 7/8 Wide x 88 Pitches, Rocker Joint Type (one blue guide link)	95-Up	HV-042
AX4S (Windstar)	3/8 Pitch x 3/4 Wide x 88 Pitches, Round Pin Type (two copper guide links)	96-Up	HV-041
CD4E (Contour/Mondeo 2.0L)	.4346 Pitch x 3/4 Wide x 90 Pitches, Rocker Joint Type, ET Guide (one copper guide link)	94-Up	HV-043
CD4E (Mystique/Cougar 2.0L)	.4346 Pitch x 3/4 Wide x 90 Pitches, Rocker Joint Type, ET Guide (one copper guide link)	98-Up	HV-043
CD4E (Contour/Mondeo 2.5L)	.4346 Pitch x 1 Wide x 92 Pitches, Rocker Joint Type, ET Guide (two copper guides separated by two silver guide links)	94-99	HV-044
CD4E (Probe 2.0L) Mazda	.4346 Pitch x 3/4 Wide x 92 Pitches, Rocker Joint Type, ET Guide (two copper guide links next to each other)	94-Up (2.5L 2000-Up)	HV-045

AXOD



Note: CD4E ET Guide Upgrade:

HV043 Used with the 2.0 Liter Engine, F3RZ7G249A, F6RZ7G249AA

HV044 Used with the 2.5 Liter Engines through 99, F5RZ7G249C, F6RZ7G249CA

HV045 Used with 2.0 Liter Probe, the later 2000 Model Yr 2.5 L are 3/4 Wide, F5RZ7G249B, F6RZ7G249BA

The latest CD4E chains use the ET Guide Technology for better wear characteristics and load distribution. The earlier non ET Guide chains should be replaced with the newer chains when the unit is down.

Transmission	Description	Year	Morse Part Number
DaimlerChrysler			
A606	One Chain – 1-3/4 Wide x 62 Pitches, Rocker Joint Type – 4539777 Discontinued, convert to TK004 and update sprockets	93-94	TK004
A606	Two Chain – (Gemini® Design) 3/4 Wide x 62 Pitches, Rocker Joint Type, ET Guide – 4659190	95-Up	HV-047
A606 Gemini Kit	Chain/Sprocket/Snubber Package (to update) 93-94 (Except Prowler Application)	93-Up	TK004
A606	Sprocket - 32 Teeth - 4659232 Drive (3.2L and 3.5L Engines)	95-Up	HS001
A606	Sprocket - 33 Teeth - 4659233 Driven (3.2L and 3.5L Engines)	95-Up	HS002
A606 Prowler	Sprocket - 31 Teeth - 4659831 Drive (2.7L and 3.5L Prowler Engines)	97-Up	HS009
A606 Prowler	Sprocket - 34 Teeth - 4659834 Driven (2.7L and 3.5L Prowler Engines)	97-Up	HS010
A606 Prowler Kit	Chain/Sprocket/Snubber Package (31 Drive, 34 Driven Sprockets)	97-Up	TK005
A606	Snubber - 4659187	all	HVS-047

42LE Morse Gemini® A606



Imports

Saab T37 (Special Order)	Non-Turbo - 1 Wide x 76 Pitches, Rocker Joint Type	72-78	HV-003
Saab T37 (Special Order)	Turbo - 1 Wide x 76 Pitches, Rocker Joint Type	79-Up	HV-023
Tercel A55	3/8 Pitch x 3/4 Width x 62 Pitches, FWD 4WD	79-86	HV-101

Transfer Case Chains by Transfer Case Model to Corresponding OEM

NEW PROCESS/NEW VENTURE GEAR

Case Model	OEM Mfg	Notes	Morse Part Number	Nominal Chain Dimensions
119	Chrysler Jeep	80-88 Jeep	HV-015	3/8 Pitch x 1-3/4 W x 98 Pitches - RJ
129	Chrysler Jeep	80-88 Jeep	HV-015	3/8 Pitch x 1-3/4 W x 98 Pitches - RJ
203	Chrys/Ford/GM	73-78	HV-005	3/8 Pitch x 2-1/2 W x 98 Pitches - RJ
203	Chrys/Ford/GM	78-79	HV-009	1/2 Pitch x 2 W x 72 Pitches - RJ
207	Chrysler	84-88 Jeep	HV-022	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
208	Chrysler Jeep	80-88 Jeep	HV-014 (RJ)/ HV-025 (RP)	1/2 Pitch x 1-1/4 W x 72 Pitches
208	Ford	80-88	HV-012	1/2 Pitch x 1-1/4 W x 84 Pitches - RP
218	GM/AM General	86-99 (Hummer)	HV-026	1/2 Pitch x 1-1/2 W x 72 Pitches - RP
219	Chrysler Jeep	80-90 Jeep	HV-015	3/8 Pitch x 1-3/4 W x 98 Pitches - RJ
228	Chrysler Jeep	80-90 Jeep	HV-015	3/8 Pitch x 1-3/4 W x 98 Pitches - RJ
229	Chrysler Jeep	80-90 Jeep	HV-015	3/8 Pitch x 1-3/4 W x 98 Pitches - RJ
231A	Chrysler Jeep	89-Up Jeep	HV-027	1/2 Pitch x 1 W x 62 Pitches - RP
231C/233C	GM	W2.8L 89-Up	HV-027	1/2 Pitch x 1 W x 62 Pitches - RP
231C/233C	GM	W4.3L 89-98	HV-022	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
231D	Chrysler	89-Up	HV-027	1/2 Pitch x 1 W x 62 Pitches - RP
233 Electric	Chrysler Jeep	95-Up Jeep	HV-027	1/2 Pitch x 1 W x 62 Pitches - RP
231/233 HD	GM	T Truck S10	HV-022	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
236/136	GM	98-Up Blazer, Bravada & Astro Van	HV-062	3/8 Pitch x 1 W x 98 Pitches - RJ
241C/243C	Chrysler/GM	GM 89-98, 243 Electric Shift, Dodge Full 93-98	HV-025	1/2 Pitch x 1-1/4 W x 72 Pitches - RP
241HD	Chrysler	Dodge 90-99	HV-031	1/2 Pitch x 1-1/2 W x 72 Pitches - RP
242/244	Chrysler Jeep	89-2000 Jeep	HV-028	1/2 Pitch x 1 W x 72 Pitches - RP
242	Chrysler	Durango, Dakota and Jeep with 5.2L and 5.9L Engines 98-01	HV-063	3/8 Pitch x 1-1/4 W x 98 Pitches - RJ
242ECE	Chrysler Jeep	Jeep Europe XJ & ZJ	HV-061	.5033 Pitch x 1 W x 72 Pitches - RJ
242H	GM/AM General	AMG Hummer	HV-060	.5033 Pitch x 1-1/4 W x 72 Pitches - RP
246	GM	99 SUV Only, One Blue Guide Link	HV-063	3/8 Pitch x 1-1/4 W x 98 Pitches - RJ
246	GM	99-Up GMT 800, 2000-Up Full Size SUV (3 Blue Guide Links)	HV-072	3/8 Pitch x 1-1/4 W x 98 Pitches - RJ
247	Chrysler Jeep	99 Jeep Grd Cherokee	HV-071 & HVS-071 Snubber	3/8 Pitch x 1 W x 98 Pitches - RJ
249	Chrysler Jeep	92-95 Jeep	HV-034	3/8 Pitch x 1-1/4 W x 98 Pitches - RJ
261/263	GM Full Time	GMT 800 (3 Blue Guide Links) 99+	HV-072	3/8 Pitch x 1-1/4 W x 98 Pitches - RJ
261HD/263HD	GM Part Time	GMT800 Full Size K Truck	HV-069	3/8 Pitch x 1-1/2 W x 98 Pitches - RJ
261SHD	Chrysler D/C	2001-Current	HV-074	.4346 Pitch x 1-1/2 W x 84 Pitches - RP
271/273 Electric shift	Ford	98-Up F250/350/450/550	HV-064	.4346 Pitch x 1-1/2 W x 98 Pitches - RP

RJ = Rocker Joint RP = Round Pin

BORG WARNER TORQUE TRANSFER SYSTEMS

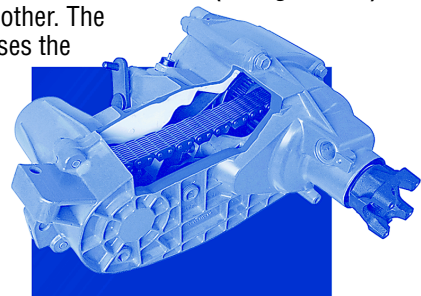
Case Model	OEM Mfg	Notes	Morse Part Number	Nominal Chain Dimensions
1305	Chrysler Jeep	73-79 Jeep	HV-007	3/8 Pitch x 2-1/2 W x 96 Pitches - RJ
1345	Chrysler Jeep	CJ7 w/Auto Overdrive	HV-007X	3/8 Pitch x 2-1/2 W x 92 Pitches - RJ
1345	Ford	Fd 80-82, 150, 250, 350	HV-013	1/2 Pitch x 1-1/2 W x 86 Pitches - RJ
1350	Ford, Chrysler	Fd 80-83, Jeep 84-88	HV-022	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
1354	Ford	Fd 90-Up	HV-022	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
1356	Ford	Fd 80-96 F Series/Bronco	HV-012	1/2 Pitch x 1-1/4 W x 84 Pitches - RP
1361	Range Rover	Range Rover 88-96	HV-049	.5033 Pitch x 2 W x 74 Pitches - RJ Spring Lk
1370	GM	80-Up Full Size Truck	HV-025	1/2 Pitch x 1-1/4 W x 72 Pitches - RP
1372*	GM	90-95 L Van All WD with Straight Pitch	HV-032	3/8 Pitch x 1-3/4 W x 86 Pitches - RJ Note: 2 Blue Links & Rounded Link Backs
1372*	GM	90-97 S Blazer Trk/Bravada/ Cyclone/Typhoon with random pitch	HV-033	3/8 Pitch x 1-3/4 W x 86 Pitches - RJ Note: 1 Blue Link & Combination Round/ Square Link Backs
4401	GM	GMC 3500	HV-025	1/2 Pitch x 1-1/4 W x 72 Pitches - RP Block Lace
4402	Hyundai	A1 Van, Galloper	HV-027	1/2 Pitch x 1 W x 62 Pitches - RP
4404	Ford	Explorer/ Mountaineer to 97	HV-051	.4346 Pitch x 1-1/4 W x 74 Pitches - RJ
4404 w/5 Liter	Ford	Explorer/ Mountaineer with 5 Liter Engines	HV-070	.4346 Pitch x 1-1/4 W x 74 Pitches - RJ
4405	Ford	Explorer to 97	HV-051	.4346 Pitch x 1-1/4 W x 74 Pitches - RJ
4405	Ford	Explorer 9/98-Up (Width Chg) TOD	HV-067	.4346 Pitch x 1 W x 74 Pitches - RJ
4406	Ford	F150/250 Man & Electronic Shift 96-4/98	HV-052	.4346 Pitch x 1-1/4 W x 86 Pitches - RP
4406	Ford	May 98-Up F150, F250 LD, F150 Manual Shift, Electronic Shift, Width Chg 5.98	HV-066	.4346 Pitch x 1 W x 86 Pitches - RP
4406 TOD	Ford	F250 96-Up, Expedition and Navigator 99+	HV-053	.4346 Pitch x 1-1/4 W x 86 Pitches - RJ
4407	Ford	F350/F250 HD	HV-054	.5033 Pitch x 1-1/2 W x 84 Pitches - RP
4408	Daewoo	Previously Sang Yong	HV-022	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
4409	Mercedes	Mercedes 97-Up	HV-055	.4346 Pitch x 1-1/2 W x 70 Pitches - RJ
4410	Ford	Explorer 5.0L 2001	HV-078	.4346 Pitch x 1-1/4 W x 74 Pitches - RJ
4411	Ford	Explorer 4.0L 2001	HV-067	.4346 Pitch x 1 W x 74 Pitches - RJ
4422	Isuzu	Isuzu 95-Up	HV-056	.4346 Pitch x 1-1/4 W x 70 Pitches - RJ
4423/4421	Sang Yung	Sport Utility Vehicle - Sang Yung 4400143015	HV-051	.4346 Pitch x 1-1/4 W x 74 Pitches - RJ
4462	Range Rover	Land Rover 97-Up	HV-057	.5033 Pitch x 2 W x 80 Pitches - RJ
4470	GM	Full Size Truck 3500/K30 90-96	HV-031	1/2 Pitch x 1-1/2 W x 72 Pitches - RP
4472	GM	90-97 L Van	HV-032	3/8 Pitch x 1-3/4 W x 86 Pitches - RP Note: 2 Blue Links & Rounded Link Backs Straight Pitch
4472	GM	90-97 S10/96 Van Safari	HV-033	3/8 Pitch x 1-3/4 W x 86 Pitches - RJ Note: 1 Blue Link & Combination Round/ Square Link Backs Random Pitch
4476	GM	Full Time	HV-076	.4346 Pitch x 1-1/4 W x 84 Pitches - RJ
4482	Hummer/GM	Full Time Hummer 2	HV-077	.4346 Pitch x 1-1/2 W x 84 Pitches - RJ

*Important Noise Situation RJ = Rocker Joint RP = Round Pin

GM L Van All Wheel Drive Astro, Safari, and Cargo Applications with BW 1372/4472 Transfer Case - HV032 (Straight Pitch)

The HV032 and the HV033 applications should not be consolidated or substituted for each other. The HV032 is a straight pitch design, and the HV033 is a random pitch design. If the rebuilder uses the HV033 Random Patterned Chain in the L Van application, the vehicle operator may hear an unsatisfactory "moan" or "boom" noise from the vehicle's driveline during operation.

Conversely, if the HV032 straight pitch chain (all rounded back links) is used in the GM S Blazer truck, the Bravada, Cyclone, and Typhoon applications that use the BW 1372/4472 with a random chain design, the vehicle owner will hear a whistle or whining noise.



OTHER APPLICATIONS: 100 SERIES ARE MANUFACTURED BY MORSE TEC, BWAKK-JAPAN
 (This series is special order)

OEM Mfg	Notes	Morse Part Number	Nominal Chain Dimensions
Austin	Maxi Allegro	HV-008	3/8 Pitch x 1 W x 74 Pitches - RJ
BMW 325 I	4WD Pre 1988	HV-024	3/8 Pitch x 1-3/4 W x 68 Pitches - RJ Straight Pitch (All rounded Link Backs)
BMW 325 I	4WD 89-90	HV-024R	3/8 Pitch x 1-3/4 W x 68 Pitches - RJ Random Pitch, Rounded & Square Link Backs
Dodge Ram 50	4WD 80-Up	HV-104	3/8 Pitch x 1-3/4 W x 82 Pitches - RJ
Ford Aerostar	(Dana TC28) 90-97	HV-048	3/8 Pitch x 1-1/4 W x 86 Pitches - RP
Geo Tracker	Suzuki Sidekick 88-Up	HV-110	3/8 Pitch x 1 W x 68 Pitches - RP
Isuzu Trooper	Truck 84-Up	HV-102	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
Mazda	Van & Pickup 84-Up	HV-105	3/8 Pitch x 1-3/4 W x 80 Pitches - RJ
Mazda	MPV 89-Up	HV-111	7/16 Pitch x 1-1/2 W x 84 Pitches - RJ
Mitsubishi	Montero (4WD) 80-Up	HV-104	3/8 Pitch x 1-3/4 W x 82 Pitches - RJ
Mitsubishi	Forte, Montero, Montero Sports Nov 90+	HV-112*	7/16 Pitch x 1-1/2 W x 70 Pitches - RJ
Mitsubishi	Forte, Montero, Montero Sports Nov 90+	HV-113*	7/16 Pitch x 1-1/4 W x 68 Pitches - RJ
Mitsubishi	Montero, Montero Sports Jul 93+	HV-114*	7/16 Pitch x 1-3/4 W x 70 Pitches - RJ
Mitsubishi	Montero Sports 8/98+	HV-115*	3/8 Pitch x 1-1/2 W x 80 Pitches - RJ
Nissan	Pathfinder/Truck 85-Up	HV-106	3/8 Pitch x 1-3/4 W x 88 Pitches - RJ
Nissan	Pathfinder 7/95-Up	HV-116*	7/16 Pitch x 1-1/4 W x 76 Pitches - RJ
Nissan	Van 86-Up	HV-107	3/8 Pitch x 1-1/4 W x 88 Pitches - RJ
Safari	Safari 87-Up	HV-108	3/8 Pitch x 1-7/8 W x 88 Pitches - RP
Scout II, IHC	(4WD) 73-79	HV-006	3/8 Pitch x 2 W x 92 Pitches - RJ
Suzuki, Chev Tracker	Suzuki Vitara/Chev Tracker 8/96-Up	HV-118*	3/8 Pitch x 1 W x 68 Pitches - RJ
Toyota	4-Runner/Truck 84-86	HV-102	1/2 Pitch x 1-1/4 W x 62 Pitches - RP
Toyota	4-Runner/Truck 87-7/88	HV-109B*	7/16 Pitch x 1-1/2 W x 74 Pitches - RJ Random pattern, springload
Toyota	4-Runner/Truck 87-93	HV-109B*	7/16 Pitch x 1-1/2 W x 74 Pitches - RJ Random pattern, springload
Toyota	4 Runner, Tacoma 4/93-Up	HV-117*	7/16 Pitch x 1-1/4 W x 74 Pitches - RJ Latest Link Profile
Toyota	Van 85-Up	HV-103	1/2 Pitch x 1 W x 62 Pitches - RP

*Special Order Only RJ = Rocker Joint RP = Round Pin

Troubleshooting Guide for Transmission and Transfer Case Hy-Vo Chain and Sprockets

SYMPTOM	CAUSE(S)	CURE(S)
Excessive Chain Wear on the guide link inside flank area	Sprockets misaligned or out of parallel.	Realign sprockets.
Chain wear on Outside/ Back of chain	Interference with case and/or excessive elongation.	Replace chain and sprockets.
Burnt Chain	Overheating, lack of lubrication.	Replace chain and inspect the lubrication situation.
Rusty Chain	There may be corrosion in the system or inadequate lubrication.	Avoid abuse, replace sprockets, check for water in oil, replace any faulty seals or breather elements, and correct lubrication situation.
Broken Links, Turned Pins	Drive system may be overloaded or there may be excessive slack in the chain causing it to “jump teeth.” Or, there may be a foreign object in the system.	Replace the chain, remove and repair the damage. Avoid overloading the drive system.
Extreme flank wear	Worn sprockets, lack of proper lubrication.	Replace sprockets and chain and correct the lubrication problem.
Excessive premature Sprocket Wear	Mismatched new and old sprocket.	Always replace both sprockets.

SYMPTOM	CAUSE(S)	CURE(S)
<p>Sprocket wear — Light Wear — Heavy Wear - Pitting</p>	<p>A certain amount is normal.</p>	<p>For heavy wear: Replace both the sprocket and chain.</p>
<p>Lubrication smells bad and is dark in color.</p>	<p>Overheating.</p>	<p>Drain and flush the case, check for cause of overheating and damaged components, replace the chain, refill lubricant to manufacturer specifications.</p> <p>In automatic transmissions, check for slipping clutches or a failed torque converter.</p>
<p>Excessive noise or vibration</p>	<p>Broken links, inadequate lubrication, misalignment, or eccentricity/face runout in sprocket.</p>	<p>Replace with properly machined sprockets, replace chain, check shafts of sprockets and realign, check bearings, correct any lubrication situation to manufacturer specifications.</p>
<p>Milky or muddy Lubrication</p>	<p>Probable water contamination.</p>	<p>Drain and flush case several times (at least three), check seals and breather components, check for other damaged components, replace chain and refill lubrication to manufacturer specs.</p>



Porque la Cadena Morse Hy-VO?

Características y Beneficios de Diseño:

Estilos de Diseño específicos de Aplicaciones: Morse ofrece una completa línea de aplicaciones que incluye perno redondo, tres estilos de cadena con unión de perno oscilante, eslabones guía ET, y el nuevo sistema patentado Morse Gemini® system. Cada uno de estos estilos son específicos por aplicación dependiendo de las cargas, las condiciones operativas, y el espacio de operación. (No se recomienda substituir estilos de diseño, puesto que el acoplamiento con los engranes se vería afectado.)

Eslabones Guía ET: El nuevo diseño patentado de eslabones guía ofrece una mejor distribución de la carga durante la operación. El diseño de cadenas será perfeccionado basados en las conversiones de servicio en Equipo Original.

Aleatorización de la Cadena: Este es un diseño patentado que utiliza dos diferentes estilos de eslabones para eliminar las frecuencias creadas en el acoplamiento con el engrane. Los patrones son seleccionados cuando se realiza el diseño de Equipo Original para minimizar el ruido y los niveles de vibración, así como para optimizar las fuerzas operativas de cada aplicación.

Características y Beneficios de Calidad:

Calidad y Certificación de Equipo Original: Además de tener la certificación QS 9000, los productos Morse HyVo, utilizan sólo aceros de la más alta calidad para los eslabones y los pernos. Esto significa que la lámina no tiene en sí inclusiones ni impurezas, contribuyendo a mejores características de tensión, fatiga y desgaste. Así mismo, el diseño y las tecnologías de manufactura especiales crean la cadena de mejor calidad en el mercado de refacciones.

Notas Importantes para los Reconstructores:

Elongación de Cadena: A pesar de los productos Morse HyVo, son fabricados para tener una máxima duración, cuando el reconstructor tiene la unidad desmontada, los engranes y las cadenas deben ser verificados.

Recuerde que es muy difícil para el cliente de refacciones medir la elongación de la cadena. Una razón para esto es el movimiento del árbol de levas cuando la unidad se encuentra separada. En algunos casos, cuando el árbol de levas está fijo y sin cubierta, la estimación de una persona experimentada en el campo puede ser aceptable.

Morse cuenta con equipo especial para medir los parámetros de elongación. Además cada aplicación puede ser diferente dependiendo de los parámetros de la aplicación.

Si no se utiliza el equipo adecuado para medir la elongación de la cadena, el rango de precisión o de error es de 50%. Cada aplicación tiene sus propias variaciones y las especificaciones recomendadas por el fabricante para las tolerancias de la cadena deben ser referenciadas.

Si la cadena ha estado en servicio por más de 60,000 millas (95,000 kms), si la unidad está rasgada, si muestra signos de problemas, descuido o desgaste – reemplace la cadena.



Pourquoi la chaîne Hy-Vo Morse

Caractéristiques de conception et avantages

Applications des styles de dessin spécifiques: Morse propose une ligne complète d'applications qui comprend des broches circulaires, trois sortes de chaînettes de raccordement de culbuteur, les chaînes de guidage ET et le Morse Gemini® system récemment breveté. Chacun d'entre eux est particularisé par des applications basées sur les charges, les conditions de fonctionnement, l'encombrement. (Substituer les styles de dessin n'est pas recommandé puisque l'enclenchement des pignons en serait affecté.)

Chaînes de guidage ET: Un dessin de chaîne de guidage récemment breveté permet une meilleure distribution de la charge lors du fonctionnement. Les dessins de chaînes seront améliorés sur les bases de conversions service OE.

Randomisation de la chaîne: C'est un dessin breveté utilisant deux styles différents de maillons pour supprimer les fréquences créées par l'enclenchement des pignons. Les modèles sont sélectionnés lors du dessin OE afin de minimiser les niveaux de bruit et de vibration et pour optimiser la durée de vie pour chaque application.

Caractéristiques qualité et avantages

Qualité et Certification OEM: En plus d'avoir la certification QS 9000, les produits Morse Hy-Vo sont faits uniquement à partir des meilleures qualités de métal pour les maillons et les broches. Ceci signifie qu'il n'y a aucune inclusion ou pollution dans le métal lui-même. Ceci contribue à l'obtention des meilleures caractéristiques de fatigue, de ductilité et d'usure. Le dessin déposé ainsi que les techniques de fabrication contribuent à proposer la meilleure qualité de chaînes sur le marché.

Remarques importantes d'entretien

Allongement de la chaîne: Même si les produits Morse Hy-Vo sont conçus pour durer, si l'unité est démontée, le réparateur devra faire une révision complète des pignons et de la chaîne.

Il faut noter qu'il est très difficile pour un client de mesurer l'allongement de la chaîne. Notamment à cause du mouvement de l'arbre lorsque l'unité est démontée. Dans certains cas, lorsque les arbres sont fixés et le couvercle enlevé, l'avis d'une personne expérimentée est conseillé.

Morse a des équipements spéciaux pour mesurer les paramètres d'allongement. De plus, chaque application peut être différente en fonction des paramètres d'application.

Le pourcentage d'exactitude ou d'erreur est de 50% si l'on n'utilise pas le matériel adéquat pour mesurer l'allongement d'une chaîne. Chaque application a ses propres variations et les spécifications recommandées par le constructeur pour les tolérances des chaînes doivent être consultées.

**Il faut remplacer la chaîne:
Tous les 60,000 miles, Si l'unité est arrachée, si l'unité présente des
signes de défaillance, de mauvais entretien ou d'usage abusif.**

Interchange

OEM	NAME	MORSE #
11428	NVG	HV005
13433	NVG	HV009
13797	NVG	HV012
13798	NVG	HV014
15027	NVG	HV015
15569	NVG	HV022
15908	NVG	HV022
16067	NVG	HV026
16417	NVG	HV027
16418	NVG	HV028
16624	NVG	HV025
16977	NVG	HV061
17167	NVG	HV022
17536	NVG	HV031
17550	NVG	HV034
17577	NVG	HV060
21967	NVG	HV074
22182	NVG	HV069
22500	NVG	HV062
23750	NVG	HV063
24273	NVG	HV064
26976	NVG	HVS071
30965	NVG	HV071
31534	NVG	HV072
433782	DANA	HV048
474613	GM	HV009
801145	CHRYSLER	HV007
2922578	SUZUKI	HV118
3821373	CHRYSLER	HV005
4115334	GM	HV009
4167995	CHRYSLER	HV025*
4338935	CHRYSLER	HV027
4446464	AMC	HV022
4539777	CHRYSLER	HV046
4636961	CHRYSLER	HV022
4638890	CHRYSLER	HV028
4659187	CHRYSLER	HVS047
4659190	CHRYSLER	HV047
4659232	CHRYSLER	S123B
4659233	CHRYSLER	S122A
4720159	CHRYSLER	HV034
4746147	CHRYSLER	HV031
4746257	CHRYSLER	HV025
5003453AA	CHRYSLER	HV063
5012322AB	CHRYSLER	HV071
5086328AA	CHRYSLER	HV064
5740090	AM GENERAL	HV026
6273991	GM	HV005
8130977	CHRYSLER	HV014
8134471	CHRYSLER	HV022
8624944	GM	HV001
8625946	GM	HV001
8632901	GM	HV010
8635171	GM	HV016
8637187	GM	HV019
8643337	GM	HV019
8646116	GM	HV018
8653991	GM	HV019
8660099	GM	HV018
8679627	GM	HV037
8682603	GM	HV035
8685784	GM	HV038
8709272	SAAB	HV003
12544694	GM	HV031

OEM	NAME	MORSE #
12544695	GM	HV025
12547628	GM	HV062
14037982	GM	HV014
14071706	GM	HV022
14079006	GM	HV022
15547422	GM	HV025
15580279	GM	HV025
15581813	GM	HV027
15619392	GM	HV031
15634064	GM	HV033
15635937	GM	HV022
15963558	GM	HV032
24200738	GM	HV039
24200771	GM	HV036
24202447	GM	HV035
24206043	GM	HV038
24206266	GM	HS003
24206267	GM	HS004
24206268	GM	HS005
24206269	GM	HS006
24206270	GM	HS007
24206271	GM	HS008
24206434	GM	HV065
24210129	GM	HV058
2922560A01	SUZUKI	HV110
2922560A00	GEO	HV110
35735010	ISUZU	HV102
83503146	CHRYSLER	HV027
83504575	CHRYSLER	HV028
96067054	SUZUKI	HV110
3315201J00	NISSAN	HV108
3315230C00	NISSAN	HV107
3315233G01	NISSAN	HV106
331520W410	NISSAN	HV116
3315230C00	NISSAN	HV107
501309297	BMW	HV024
501311424	BMW	HV024R
1345143002	WARNER GEAR	HV012
1350143001	WARNER GEAR	HV022
1370143001	WARNER GEAR	HV025
1370143002	WARNER GEAR	HV031
1372143001	WARNER GEAR	HV033
3578116010	TOYOTA	HV101
3629328010A	TOYOTA	HV103
3629328010	TOYOTA	HV103
3629335010	TOYOTA	HV109B
3629335020	TOYOTA	HV109B
3629335010	TOYOTA	HV109B
3629335021	TOYOTA	HV109B
3629335030	TOYOTA	HV117
3629335031	TOYOTA	HV117
4351430021	SAAB	HV003
4400143002	WARNER GEAR	HV051
4400143005	WARNER GEAR	HV053
4400143006	WARNER GEAR	HV056
4400143007	WARNER GEAR	HV052
4400143009	WARNER GEAR	HV055
4400143010	WARNER GEAR	HV027
4400143014	WARNER GEAR	HV067
4400143015	WARNER GEAR	HV051
4400143017	WARNER GEAR	HV070
4400143023A	WARNER GEAR	HV076
4400143025A	WARNER GEAR	HV077
4400143027	WARNER GEAR	HV078

OEM	NAME	MORSE #
4401143001	WARNER GEAR	HV025
4407143001	WARNER GEAR	HV054
4411143003	WARNER GEAR	HV067
4411143005	WARNER GEAR	HV067
4462143001	WARNER GEAR	HV057
4470143001	WARNER GEAR	HV031
4472143001	WARNER GEAR	HV032
8971292370	ISUZU	HV056
13630591010	HONDA	HV004
25780016010	TOYOTA	HV101
27241226319	BMW	HV024
0435143002V	BLMC/WOLSELEY	HV002
0437143001X	SAAB	HV023
12352L1101	NISSAN	HV020
13611343001R	RANGE ROVER	HV049
3080173001DA	ISUZU	HV102
3090173001DA	TOYOTA	HV102
3315201J00	NISSAN	HV108
3315233G01	NISSAN	HV106
3629328010A	TOYOTA	HV103
42169C1	IHC	HV006
D4TZ7A029A	FORD	HV005
D8TZ7A029A	FORD	HV009
E0TZ7A029A	FORD	HV012
E0TZ7A029B	FORD	HV013
E2TZ7A029A	FORD	HV012
E3TZ7A029A	FORD	HV022
E6DZ7G249A	FORD	HV021
E6SP7G249AA	FORD	HV021
E8DZ7G249A	FORD	HV029
F09Z7A029A	FORD	HV048
F3DZ7G249A	FORD	HV040
F3RP7G249DA	FORD	HV043
F3RP7G249FA	FORD	HV045
F3RP7G249GA	FORD	HV044
F3RZ7G249A	FORD	HV043
F5DZ7G249A	FORD	HV042
F50P7G249AA	FORD	HV042
F57Z7A029A	FORD	HV051
F5RZ7G249B	FORD	HV045
F5RZ7G249C	FORD	HV044
F6RZ7G249AA	FORD 2.0L	HV043
F6RZ7G249CA	FORD 2.5L	HV044
F6RZ7G249BA	FORD PROBE	HV045
F5TZ7A029A	FORD	HV054
F65Z7A029AA	FORD	HV052
F68P7G249AA	FORD	HV041
F70Z7G249AA	FORD	HV042
F75Z7A029AA	FORD	HV053
F8Z7A029BB	FORD	HV070
J8130831	CHRYSLER	HV015
J8134471	CHRYSLER	HV022
M50117945	MAZDA	HV105
MD446415	MITSUBISHI	HV115
MD704196	CHRYSLER	HV104
MD738550	MITSUBISHI	HV113
MD886422	MITSUBISHI	HV112
MD936280	MITSUBISHI	HV114
R50117945B	MAZDA	HV111
XL2Z7A029AA	FORD	HV051
XL2Z7A029BB	FORD	HV067
1L2Z7A029LA	FORD	HV078

*HV025 is a round pin design which is the latest for the NVG 208 Dodge and NVG 241 GM & Dodge applications. The HV025 can replace the HV014 without sprocket problems in these applications.